

Description

This invention relates, in general, to electrical connectors and, more particularly, the invention relates to shielded headers used to connect electrically a cable connector to a printed circuit board or other electrical device while restricting the emission of electromagnetic energy therefrom to prevent interference with other electrical devices.

A known shielded header, described hereinafter, has a dielectric housing provided with a cavity open at its top, the cavity being bounded by elongate side walls, and walls and a floor. A plurality of contact pins are mounted in the cavity and project through the floor and outwardly from the housing. A female connector with a cable fits inside the cavity and establishes connection therein between the pins and contacts of the connector.

US-A 4 386 814 describes a kit for converting connector receiving apertures in a panel to a shielded pin receptacle. While this kit appears to provide the required shielding, it requires extensive work to make the conversion.

In known designs, the insertion force necessary to couple the mating parts of the connector together are high and the arrangement for connecting the receptacle or housing and the connector to ground is not particularly effective.

A general object of the invention is to provide an improved form of shielded header.

The present invention provides a shielded header for providing electrical connection and restricting the emission of high frequency electromagnetic energy; said header comprising a dielectric housing provided with a cavity open at its top, the cavity being bounded by side walls and a floor having a plurality of contact pins mounted in the cavity and projecting through the floor and outwardly from the housing and at least one electrically conductive spring contact mounted in the housing. In accordance with the invention, the conductive spring contact has a body from which extends a plurality of alternate contact beams and L-shaped ground bars. The contact beams project in a common plane with each beam in contact with an interior side wall surface of the cavity and the ground bars project in a plane substantially perpendicular to the contact beams for external contact to ground.

The shielded header can be used in an assembly with a female shielded cable connector which has contacts for engaging with the contact pins of the header when the connector is inserted into the cavity of the housing to engage with the contact beams.

In a preferred embodiment the shielded header comprises a dielectric housing having a cavity open at its top, the cavity being enclosed by front

and rear elongate side walls and two end walls together with a floor perforated with a plurality of through holes each accommodating an electrically conductive pin; wherein side skirts extend downward from the side wall and are provided with a plurality of vertical grooves; an elongate ground strip is mounted between the side skirts, the ground strip having a plurality of notches aligned with the lower ends of the grooves and electrically conductive spring contacts are mounted in the housing each spring contact having alternate contact beams and L-shaped ground bars as aforesaid. A plurality of locking tabs project away from the contact beams of each spring contact and a plurality of shelf tabs also project away from the contact beams and locate between the locking tabs. The spring contacts are disposed so that each contact beam is in contact with an interior side of one of the side walls with one leg of each ground bar projecting at right angles from the exterior of the side walls and the shelf tabs for the exterior grounding. The locking tabs are bent inwardly to cooperate with the shelf tabs and grip opposite flat sides of the ground strip.

A shielded header constructed in accordance with the invention provides excellent protection against the escape of electromagnetic energy. It also has a low insertion force with respect to the female connector, low contact wear, adaptability to any length header and with metal parts suitable for high speed stamping.

The dielectric housing of the inner cavity may contain vertical through holes for receiving standard electrically conductive pins. Usually these pins are set out in a double row. The exterior of the housing can have rear grooves and front grooves for receiving a pair of metal spring contacts as aforesaid which are slid in the grooves between rib structures on the exterior of the housing and into a series of holes leading to the interior of the housing. Optionally, a filter can be contained within the housing around each of the electrically conductive pins.

Other features of the invention may become apparent from consideration of the following description.

The present invention may be best understood by those having ordinary skill in the art by reference to the following detailed description when considered in conjunction with the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a shielded header and header assembly constructed in accordance with the invention;

Figure 2 is a front perspective view of a right-angled shielded header constructed in accordance with the invention;

Figure 3 is a rear perspective view of the right-

angled shielded header;

Figure 4 is a cross-sectional end view of the shielded header of Figure 1 with the pins removed;

Figure 5 is a cross-sectional end view of the shielded header of Figure 1 with the pins, spring contact and filter element in place;

Figure 6 is a part sectional end view of the right-angled shielded header;

Figure 7 is a part-sectional view of a further embodiment of a shielded header assembly constructed in accordance with the invention;

Figure 8 is an enlarged elevation of a spring contact for use in the shielded header; and

Figure 9 is a perspective view of a prior art shielded header assembly.

Figure 9 depicts a typical known form of shielded header assembly composed of a female cable connector 12 containing female terminals (not shown) for engaging with pins (not shown) in a complementary housing 94 forming a shielded header. The connector 12 is adapted to fit into a cavity of the housing 94 and the connector 12 is attached to a cable 18 with conductors leading to the terminals thereof. The housing 94 and the connector 12 have interengaging projections and recesses 90, 92 which act like a detent to effect positive locking between the connector 12 and the housing 94. The housing 94 has end portions with bores for receiving bolts 80 used to clamp the housing 94 to a chassis or frame of electrical equipment and facilities are provided to establish electrical connection between the pins in the housing 94 and a printed circuit board of the equipment.

Description of Preferred Embodiments

As shown in Fig. 1, a shielded header assembly 10 constructed in accordance with the invention also comprises a female cable connector 12 containing female terminals (not shown) of sufficient number to engage pins 14 mounted within through holes 68 in a floor or base wall of a dielectric housing 16 forming a shielded header. One end of connector 12 is attached to an electrical cable 18 and the other end fits within a cavity 20 of the housing 16. The cavity 20 is defined by front and rear elongate side walls 24 (Figs. 4 to 6) end walls and the base wall. With the connector 12 mating with the housing 16, a contact receptacle 22 on the exterior of connector 12 makes electrical contact with contact beams 62 of spring contacts 44 depicted in Figure 8 on one of the two interior sidewalls 24 defining the cavity 20. The housing 16 contains through holes 26 and 28 on L-shaped end portions 30 and 32 respectively for use in bolting the header housing 16 with bolts 80 onto a computer chassis 78 (Figs. 5, 7 and 8) or other elec-

trical device employing a printed circuit board 34 directly beneath the housing 16. These end portions 30, 32 also have U-shaped openings 35 for use in bolting the housing 16 to an alternative disposition. Figs. 2 and 3 depict the header assembly in this alternative mode with the printed circuit board 34 alongside the housing 16.

A ground strip 36 is affixed to the bottom 38 of the housing 16 with the aid of the spring contacts 44 as described hereinafter. The ground strip 36 has an open mid-portion 40 to accommodate the pins 14 which pass therethrough and enter holes 42 in the circuit board 34. Notches 41 on both edges of the ground strip 36 accommodate the beams 62 formed on the elongate conductive metal spring contacts 44. Holes 27 and 29 in the strip 36 align with the holes 26 and 28 respectively in the end portions of the housing 16 while holes 31 in the strip 36 align with the U-shaped openings 35 on housing 16.

The spring contacts 44 are inserted into grooves 46 and grooves 48 independent side skirts of the rear and front sidewalls 24 of the housing 16. Vertical ribs 50 on both the rear and front sides of housing 16 delineate the grooves 46 and 48.

The spring contacts 44 are stamped out of sheet stock in a high speed progressive die and have the configuration depicted in Figs. 1 and 8. More particularly, as shown in Fig. 8, each contact 44 has a main body portion or carrier provided with indexing holes 52 spaced therealong and aligned with the contact beams 62 extending therefrom. Locking tabs 54 project from the carrier opposite the respective contact beams 62. Ground bars 58, extend from the carrier between the contact beams 62 and shelf tabs 56 project from the carrier in the opposite direction to the ground bars 58. Retention tabs or barbs 60 are formed at the bases of the contact beams 62 at the juncture with the carrier. When stamped out, the locking tabs 54, retention barbs 60 and beams 62 are substantially in a common plane, whereas the ground bars 58 have a L-shaped profile with limbs in the plane and limbs at right-angles to that plane. The shelf tabs 56 are curved at approximately a 45° angle from that plane but in the opposite direction from the perpendicular limbs of the ground bars 58. The spring contacts 44 pass through holes 74 (Fig. 4) in the housing 16 so that one portion of each spring contact 44 lies inside the housing 16 and another portion remains outside the housing 16 in grooves 46 and 48. As shown in Figs. 4 to 6, each beam 62 has one end 64 inserted into a slot 66 in the associated interior wall 24 of housing 16. Each contact 44 is inserted into the housing 16 by sliding its beams 62 into the appropriate groove 46, 48 and between the ribs 50. The beam 62 then passes through the appropriate opening 74 in the housing

so that the ends 64 of the beams 62 project into the associated slot 66 in the interior wall 24 of housing 16 as shown in Figs. 4, 5 and 6. The beams 62 are stressed or pre-loaded so as to reduce the insertion force on the cable connector 12. The ground bars 58 come to rest at the L-shaped indentations in the housing 16 just above the grooves 46, 48. As shown in Fig. 5, the locking tabs 54 are folded over the lower side of the ground strip 36 to lock it into position. The shelf tabs 56 provide compliant contact with the other side of the ground strip 36. The ground bars 58 project laterally at right-angles from the housing 16 just below the associated wall 24 and contact the chassis 78. The ground bars 58 make efficient contact with the chassis 78 as shown in Fig. 5 and ensure grounding along the entire side of the header instead of primarily at the ends as is the case with the prior art header shown in Fig. 9. The tabs serve to anchor the strip contacts 44 into the plastics walls of the housing 16.

In the right-angled header assembly shown in Figs. 2 and 3, the contact pins 14a are L-shaped with portions extending laterally of the housing 16 as opposed to the pins 14 in the embodiment of Fig. 1 which are straight. The pins 14a engage in the holes 42 in the circuit board 34 and the contacts 44 are again inserted into the housing 16 so that ground bars 58 locate to the housing 16 as before.

The housing 16 can be made from any suitable dielectric material such as polycarbonate or polyester. The pins 14, 14a, and contacts 44 are usually phosphor bronze or some other conductive metal and the ground strip 36 can be made out of any conductive material such as steel, copper, aluminum, etc.

Fig. 7 depicts an alternative mounting arrangement where a further frame structure 84 is fixed to the chassis 78 with bolts 82.

Latch receptacle designated 76 in Figs. 4 and 6 in the housing 16 is an optional feature.

Fig. 5 also shows as another optional variation, a filter 70 in the header to provide additional protection against the escape of electromagnetic energy. The pins 14 are soldered at 72 to the filter 70. Our European patent applications 84 302 143.7 (EP-A-0123457) and 84 302 142.9 (EP-A-0124264) describe suitable filter structures.

Claims

1. A shielded header for providing electrical connection between a cable and an electrical device while restricting the emission of high frequency electromagnetic energy; said header comprising a housing (16) made from a dielectric material having a cavity (20) open at its

top, the cavity being bounded by side walls (24) and a floor having a plurality of contact pins (14, 14a) mounted in the cavity and projecting through the floor and outwardly from the housing (16) and at least one electrically conductive spring contact (44) mounted in the housing; wherein the conductive spring contact (44) has a body from which extends a plurality of alternate contact beams (62) and L-shaped ground bars (58), the contact beams (62) projecting in a common plane with each beam (62) in contact with an interior side wall surface of the cavity (20) and the ground bars (58) projecting in a plane substantially perpendicular to the contact beams (62) for external contact to ground.

2. A shielded header according to claim 1, wherein the spring contact (44) also has alternate shelf tabs (56) and locking tabs (54) opposite the contact beams (62) and ground bars (58).

3. A shielded header according to claim 1, wherein the side walls (24) have depending side skirts, an elongate ground strip (36) is mounted between the side skirts and the spring contact (44) has a plurality of locking tabs (54) projecting away from the contact beams (62) said locking tabs (54) being bent to engage with the ground strip (36).

4. A shielded header according to claim 3, wherein the spring contact (44) also has shelf tabs (56) projecting away from the contact beams (62) and disposed between the locking tabs (54), the shelf tabs (56) being bent to engage with the ground strip (36) and co-operate with the locking tabs (54) in gripping the ground strip.

5. A shielded header according to claims 3 or 4 wherein the side skirts are provided with a plurality of vertical grooves (46,48), the ground strip (36) has a plurality of notches (41) aligned with the lower ends of the grooves (46, 48), the spring contact (44) being disposed so that it is in contact with an interior side of the side walls, and the shelf tabs (56) and locking tabs (54) are bent inwardly to grip opposite flat sides of the ground strip (36).

6. A shielded header according to any one of claims 1 to 5 wherein each electrical contact pin (14, 14a) is encircled by a filter element (70).

7. A shielded header according to any one of

so that the ends 64 of the beams 62 project into the associated slot 66 in the interior wall 24 of housing 16 as shown in Figs. 4, 5 and 6. The beams 62 are stressed or pre-loaded so as to reduce the insertion force on the cable connector 12. The ground bars 58 come to rest at the L-shaped indentations in the housing 16 just above the grooves 46, 48. As shown in Fig. 5, the locking tabs 54 are folded over the lower side of the ground strip 36 to lock it into position. The shelf tabs 56 provide compliant contact with the other side of the ground strip 36. The ground bars 58 project laterally at right-angles from the housing 16 just below the associated wall 24 and contact the chassis 78. The ground bars 58 make efficient contact with the chassis 78 as shown in Fig. 5 and ensure grounding along the entire side of the header instead of primarily at the ends as is the case with the prior art header shown in Fig. 9. The tabs serve to anchor the strip contacts 44 into the plastics walls of the housing 16.

In the right-angled header assembly shown in Figs. 2 and 3, the contact pins 14a are L-shaped with portions extending laterally of the housing 16 as opposed to the pins 14 in the embodiment of Fig. 1 which are straight. The pins 14a engage in the holes 42 in the circuit board 34 and the contacts 44 are again inserted into the housing 16 so that ground bars 58 locate to the housing 16 as before.

The housing 16 can be made from any suitable dielectric material such as polycarbonate or polyester. The pins 14, 14a, and contacts 44 are usually phosphor bronze or some other conductive metal and the ground strip 36 can be made out of any conductive material such as steel, copper, aluminum, etc.

Fig. 7 depicts an alternative mounting arrangement where a further frame structure 84 is fixed to the chassis 78 with bolts 82.

Latch receptacle designated 76 in Figs. 4 and 6 in the housing 16 is an optional feature.

Fig. 5 also shows as another optional variation, a filter 70 in the header to provide additional protection against the escape of electromagnetic energy. The pins 14 are soldered at 72 to the filter 70. Our European patent applications 84 302 143.7 (EP-A-0123457) and 84 302 142.9 (EP-A-0124264) describe suitable filter structures.

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1. A shielded header for providing electrical connection between a cable and an electrical device while restricting the emission of high frequency electromagnetic energy; said header comprising a housing (16) made from a dielectric material having a cavity (20) open at its

top, the cavity being bounded by side walls (24) and a floor having a plurality of contact pins (14, 14a) mounted in the cavity and projecting through the floor and outwardly from the housing (16) and at least one electrically conductive spring contact (44) mounted in the housing; wherein the conductive spring contact (44) has a body from which extends a plurality of alternate contact beams (62) and L-shaped ground bars (58), the contact beams (62) projecting in a common plane with each beam (62) in contact with an interior side wall surface of the cavity (20) and the ground bars (58) projecting in a plane substantially perpendicular to the contact beams (62) for external contact to ground.

2. A shielded header according to claim 1, wherein the spring contact (44) also has alternate shelf tabs (56) and locking tabs (54) opposite the contact beams (62) and ground bars (58).

3. A shielded header according to claim 1, wherein the side walls (24) have depending side skirts, an elongate ground strip (36) is mounted between the side skirts and the spring contact (44) has a plurality of locking tabs (54) projecting away from the contact beams (62) said locking tabs (54) being bent to engage with the ground strip (36).

4. A shielded header according to claim 3, wherein the spring contact (44) also has shelf tabs (56) projecting away from the contact beams (62) and disposed between the locking tabs (54), the shelf tabs (56) being bent to engage with the ground strip (36) and cooperate with the locking tabs (54) in gripping the ground strip.

5. A shielded header according to claims 3 or 4 wherein the side skirts are provided with a plurality of vertical grooves (46,48), the ground strip (36) has a plurality of notches (41) aligned with the lower ends of the grooves (46, 48), the spring contact (44) being disposed so that it is in contact with an interior side of the side walls, and the shelf tabs (56) and locking tabs (54) are bent inwardly to grip opposite flat sides of the ground strip (36).

6. A shielded header according to any one of claims 1 to 5 wherein each electrical contact pin (14, 14a) is encircled by a filter element (70).

7. A shielded header according to any one of



claims 1 to 6, wherein the housing (16) has end portions (30) with apertures or holes (26, 35) therein for mounting the header to a chassis (78) of a computer or a printed circuit board.

8. A shielded header according to any one of claims 1 to 6 wherein at least one of the ground bars (58) is in external contact with a chassis (78) of the electrical device.

9. Use of a shielded header according to any one of the preceding claims in a shielded header assembly further comprising a female shielded cable connector (12) with contacts for engaging with the contact pins (14, 14a) of the header, the connector (12) being inserted in to the cavity of the housing to engage with the contact beams (62) and an electrical device connected to the housing (16) of the header.

Revendications

1. Un connecteur blindé destiné à réaliser une connexion électrique entre un câble et un dispositif électrique tout en restreignant l'émission d'énergie électromagnétique à haute fréquence ; ledit connecteur comportant un boîtier (16) réalisé en un matériau diélectrique et présentant une cavité (20) ouverte dans sa zone supérieure, la cavité étant limitée par des parois latérales (24) et une embase présentant une pluralité de broches de contact (14, 14a) montées dans la cavité et traversant l'embase pour faire saillie à l'extérieur sur le boîtier (16) et au moins un contact élastique électriquement conducteur (44) monté dans le boîtier ; dans lequel le contact élastique conducteur (44) présente un corps à partir duquel s'étendent une pluralité de languettes de contact (62) et de barrettes de mise à la terre (58) en forme de L, disposées en alternance, les languettes de contact (62) s'étendent en saillie dans un plan commun, chaque languette (62) étant en contact avec une surface d'une paroi latérale interne de la cavité (20) tandis que les barrettes de mise à la terre (58) s'étendent dans un plan sensiblement perpendiculaire aux languettes de contact (62) pour réaliser un contact externe à la terre.

2. Un connecteur blindé selon la revendication 1, dans lequel le contact élastique (44) présente également des pattes de positionnement (56) et des pattes de blocage (54) disposées en alternance, en regard des languettes de contact (62) et des barrettes de mise à la terre (58).

3. Un connecteur blindé selon la revendication 1, dans lequel les parois latérales (24) présentent des jupes latérales pendantes, une bande oblongue de mise à la terre (36) est montée entre les jupes latérales, et le contact élastique (44) présente une pluralité de pattes de blocage (54) s'étendant dans le sens opposé aux languettes de contact (62), lesdites pattes de blocage (54) étant pliées pour s'engager avec la bande de mise à la terre (36).

4. Un connecteur blindé selon la revendication 3, dans lequel le contact élastique (44) présente également des pattes de positionnement (56) s'étendant dans le sens opposé aux languettes de contact (62) et disposées entre les pattes de blocage (54), les pattes de positionnement (56) étant pliées pour s'engager avec la bande de mise à la terre (36) et coopérer avec les pattes de blocage (54), dans le serrage de la bande de mise à la terre.

5. Un connecteur blindé selon les revendications 3 ou 4, dans lequel les jupes latérales sont pourvues d'une pluralité de gorges verticales (46, 48), la bande de mise à la terre présente une pluralité d'encoches (41) alignées avec les extrémités inférieures des gorges (46, 48), le contact élastique (44) étant disposé de façon à venir en contact avec une face interne des parois latérales, tandis que les pattes de positionnement (58) et les pattes de blocage (54) sont pliées vers l'intérieur pour serrer les faces plates opposées de la bande de mise à la terre (36).

6. Un connecteur blindé selon l'une quelconque des revendications 1 à 5, dans lequel chaque broche de contact électrique (14, 14a) est entourée par un élément de filtre (70).

7. Un connecteur blindé selon l'une quelconque des revendications 1 à 6, dans lequel le boîtier (16) présente des parties d'extrémité (30) pourvues d'ouvertures ou trous (26, 35) destinés au montage du connecteur sur le châssis (78) d'un ordinateur ou d'une plaquette de circuit imprimé.

8. Un connecteur blindé selon l'une quelconque des revendications 1 à 6, dans lequel au moins l'une des barrettes de mise à la terre (58) est en contact externe avec le châssis (78) du dispositif électrique.

9. L'utilisation d'un connecteur blindé selon l'une quelconque des revendications précédentes dans un système de connecteur blindé com-



portant en outre un connecteur femelle blindé pour câble (12) pourvu de contacts destinés à s'engager avec les broches de contact (14, 14a) du connecteur blindé, le connecteur (12) étant inséré dans la cavité du boîtier afin de venir en engagement avec les languettes de contact (52) et un dispositif électrique connecté au boîtier (16) du connecteur blindé.

Patentansprüche

1. Abgeschirmter Verteilerkopf zur Bereitstellung einer elektrischen Verbindung zwischen einem Kabel und einer elektrischen Einrichtung unter gleichzeitiger Begrenzung der Emission von hochfrequenter elektromagnetischer Energie, wobei der Verteilerkopf ein Gehäuse (16) aufweist, das aus einem dielektrischen Material hergestellt ist und einen Hohlraum (20) hat, der an seiner Oberseite offen ist, der Hohlraum durch Seitenwände (24) und einem Boden begrenzt wird, welcher eine Mehrzahl von Kontaktstiften (14, 14a) hat, die im Hohlraum angebracht sind und durch den Boden und nach aussen von dem Gehäuse (16) vorstehen und wenigstens einen elektrisch leitenden Federkontakt (44) hat, der im Gehäuse angebracht ist, bei dem der leitende Federkontakt (44) einen Körper hat, von dem eine Mehrzahl von abwechselnd vorgesehenen Kontaktgliedern (62) und L-förmigen Massegliedern (58) abgehen, die Kontaktglieder (62) in eine gemeinsame Ebene vorstehen und jedes Glied (62) in Kontakt mit einer inneren Seitenwandfläche des Hohlraums (20) ist, und bei dem die Masseglieder (58) in eine Ebene im wesentlichen senkrecht zu den Kontaktgliedern (62) für einen äußeren Kontaktschluß mit Masse ragen.
2. Abgeschirmter Verteilerkopf nach Anspruch 1, bei dem der Federkontakt (44) abwechselnd auch Unterteilungsansätze (56) und Verriegelungsansätze (54) den Kontaktgliedern (62) und den Massegliedern (58) gegenüberliegend hat.
3. Abgeschirmter Verteilerkopf nach Anspruch 1, bei dem die Seitenwände (24) herabhängende Seitenränder haben, ein längliches Masseband (36) zwischen den Seitenrändern angebracht ist und der Federkontakt (44) eine Mehrzahl von Verriegelungsansätzen (54) hat, die von den Kontaktgliedern (62) vorstehen, wobei die Verriegelungsansätze (54) zum Zusammenarbeiten mit dem Masseband (36) gebogen sind.
4. Abgeschirmter Verteilerkopf nach Anspruch 3, bei dem der Federkontakt (44) auch Unterteilungsansätze (56) hat, die von den Kontaktglie-

dern (62) vorstehen und zwischen den Verriegelungsansätzen (54) angeordnet sind, und die Unterteilungsansätze (56) zum Zusammenarbeiten mit dem Masseband (36) gebogen sind und mit den Verriegelungsansätzen (54) beim Ergreifen des Massebandes zusammenarbeiten.

5. Abgeschirmter Verteilerkopf nach Anspruch 3 oder 4, bei dem die Seitenränder mit einer Mehrzahl von vertikalen Ausnehmungen (46, 48) versehen sind, das Masseband (36) eine Mehrzahl von Ausnehmungen (41) hat, die zu den unteren Enden der Ausnehmungen (46, 48) fluchten, der Federkontakt (44) derart angeordnet ist, daß er in Kontakt mit einer inneren Seite der Seitenwände ist, und die Unterteilungsansätze (56) und die Verriegelungsansätze (54) nach innen gebogen sind, um gegenüberliegende flache Seiten des Massebandes (36) zu ergreifen.
6. Abgeschirmter Verteilerkopf nach einem der Ansprüche 1 bis 5, bei dem jeder elektrischer Kontaktstift (14, 14a) von einem Filterelement (70) umgeben ist.
7. Abgeschirmter Verteilerkopf nach einem der Ansprüche 1 bis 6, bei dem das Gehäuse (16) Endabschnitte (30) mit Öffnungen oder Löchern (26, 35) darin zur Anbringung des Verteilerkopfes an einem Chassis (78) eines Computers oder einer gedruckten Schaltungsplatte hat.
8. Abgeschirmter Verteilerkopf nach einem der Ansprüche 1 bis 6, bei dem wenigstens eines der Masseglieder (58) in Außenkontakt mit einem Chassis (78) der elektrischen Einrichtung ist.
9. Verwendung eines abgeschirmten Verteilerkopfes nach einem der vorangehenden Ansprüche in einer abgeschirmten Verteilerkopfanordnung, welche ferner einen aufnehmenden, abgeschirmten Kabelverbinder (12) mit Kontakten zum Zusammenarbeiten mit den Kontaktstiften (14, 14a) des Verteilerkopfes aufweist, wobei der Verbinder (12) in den Hohlraum des Gehäuses eingeführt wird, um mit den Kontaktgliedern (62) zusammenzuarbeiten und eine elektrische Einrichtung mit dem Gehäuse (16) des Verteilerkopfes verbunden wird.

