

A double-ended electrical plug receptacle connector assembly.

There is disclosed in US—A—4,153,327, a double-ended electrical plug receptacle connector assembly comprising; an insulating housing having oppositely directed plug-receiving faces, a plug-receiving opening in each such face, first and second opposed internal side walls and third and fourth opposed internal side walls, extending between the plug-receiving faces; and an elongate, contact carrying, insulating member having first and second ends each proximate to a respective one of the plug-receiving faces, and first and second opposite surfaces extending between its ends, the first opposite surface facing the second internal side wall of the housing and the second opposite surface being adjacent to the first internal side wall of the housing, a plurality of juxtaposed electrical contacts mounted on the contact carrying member each comprising first and second contact spring portions connected by an intermediate portion disposed between the first internal side wall of the housing and the first opposite surface of the contact carrying member, each contact spring portion extending from the first opposite surface at a position proximate to a respective one of the plug-receiving faces and projecting obliquely inwardly of such face and towards the second internal side wall for engagement by a contact element of an electrical plug inserted through the plug receiving opening of such face.

This known assembly comprises three insulating parts that must be fitted together in the transverse direction of the completed assembly. Since no mechanical means are disclosed in US—A—4,153,327, for securing the parts in their assembled condition, the parts are presumably so secured, by the use of ultrasonic welding or by adhesive means.

According to the present invention, an assembly as defined in the first paragraph of this specification is characterised in that the housing is in the form of a tubular sheath, which has been moulded in one piece and to which the contact carrying member can be assembled by sliding it longitudinally into the sheath through one of the plug receiving openings, the sheath having therein latching means co-operating, with a snap action, with complementary latching means on the contact carrying member, to restrain withdrawal of the contact carrying member from the sheath when the former has been slid home into the latter to an extent to position each first and second end of the contact carrying member proximate to its respective plug receiving face, the latching means of the sheath and of the contact carrying member comprising shoulders which abut one another when the contact carrying member has been slid home into the sheath, the shoulders then being urged into engagement with one another by spring means acting

between the contact carrying member and an end surface of the housing adjacent to the one plug receiving opening, the spring means which is provided on the first end of the contact carrying member, which end trails during the insertion of the contact carrying member into the sheath, comprising a pair of cantilever spring arms extending in opposite directions transversely of the contact carrying member each for engagement with a shoulder formed within the sheath.

An electrical plug receptacle connector according to the invention comprises only two insulating parts, which can each readily be moulded in one piece by the use of injection moulding and which can readily be assembled for use without the use of adhesives or tooling. The two parts may readily be designed for injection moulding by means of straight action moulding tools as described below.

For a better understanding of the invention, an embodiment thereof will now be described by way of example with reference to the accompanying drawings in which:—

Figure 1 is a perspective view of an electrical plug receptacle connector assembly, showing a pair of electrical plugs to be mated therewith, the receptacle connector assembly being provided with a mounting bracket;

Figure 2 is an enlarged view taken on the lines II—II of Figure 1, in which the mounting bracket is not shown;

Figure 3 is a perspective view, with part removed, of an insulating housing sheath of the assembly;

Figure 4 is an enlarged perspective view of a contact carrying, insulating member of the assembly for insertion into the housing sheath and having electrical contacts mounted thereon;

Figure 5 is a view taken on the lines V—V of Figure 4;

Figure 6 is a view taken on the lines VI—VI of Figure 5;

Figure 7 is a fragmentary perspective view, taken from beneath the contact carrying member, in which the contacts are not shown;

Figures 8 to 11 are view taken on the lines VIII—VIII of Figure 2, the lines IX—IX of Figure 8, the lines X—X of Figure 2, and the lines XI—XI of Figure 10, respectively; and

Figure 12 is a view of the housing sheath taken on the lines XII—XII of Figure 2, showing the use of tools in moulding the sheath.

As shown in Figures 1 to 3, a double ended electrical plug receptacle connector assembly 4, comprises an insulating housing in the form of a tubular housing sheath 30 which has been moulded in one piece from a plastics material. The sheath 30 has oppositely directed plug receiving faces 6 and 8, in which are formed plug receiving openings 10 and 12, respectively, and has first and second opposed internal side walls

14 and 16, opposed internal end walls 18 and 20, opposed external side walls 22 and 24, and 28. The sheath 30 is arranged slidably receive a contact carrying member in the form of a substantially T-shaped (as seen in Figure 5) insulating frame 32 moulded in one piece from an insulating plastics material and on which are mounted strip shaped electrical contacts 34. As shown in Figure 1, the connector assembly 2 can be secured to a support (not shown) by means of a bracket 104.

The frame 32 comprises, as best seen in Figures 4 and 5, an elongate, flat, substantially rectangular web 36 having first and second ends 38 and 39, respectively, proximate to the faces 6 and 8, respectively, first and second opposite surfaces 40 and 42 of the web 36 extending between the ends 38 and 39, respectively, the surface 40 facing the side wall 16 and the surface 42 being adjacent to the side wall 14.

The surface 42 has formed therein a plurality of parallel, juxtaposed channels 49 extending along the full length thereof. Each contact 34 has a first contact spring portion 46, a second contact spring portion 47, and an intermediate portion 48 connecting the portions 46 and 47 and being received in a respective one of the channels 49. Each portion extends about the ends 38 and 39 of the web 36 and through a through aperture 50 therein proximate to the end 38 of the web 36. The frame 32 has medial wall 52 extending at right angles thereto from the surface 40 of the web 36 towards the side wall 16 and lying in a plane which is essentially perpendicular to the side walls 14 and 16 and to the side walls 18 and 20, of the sheath 30. The medial wall 52 has a plurality of juxtaposed parallel barrier walls 53 extending from either side thereof and perpendicular thereto towards the faces 6 and 8. The first and second contact spring portions 46 and 47 of each contact 34 project from the surface 40, obliquely inwardly of the faces 6 and 8 and towards the side wall 16 as best seen in Figure 5, and terminate in free ends 54 each received between an adjacent pair of the barrier walls 53.

Each contact 34, which consists of a single elongate strip of stamped and formed sheet metal, has extending laterally of its portion 49, barbs 58 (Figure 6) engaged in notches 60 in the side walls of the respective channel 49, to position and retain the portion 48 of the contact 34 in the channel 49.

When the contacts 34 have been assembled to the frame 32, the frame 32 is ready to be slid into the sheath 30, with the end 39 of the frame 32 leading. As best seen in Figure 8, the frame 32 is positioned in the sheath 30 by virtue of the snug engagement of lateral ribs 68 on either side of the web 36, in respective grooves 62 formed in the internal side walls 18 and 20, and being defined by resilient ribs 66 in the sheath 30, which extend between the plug-receiving

faces 6 and 8. When the frame 32 has been slid fully into the sheath 30, so that the ends 38 and 39 of the web 36 are proximate to the faces 6 and 8, shoulders 70 (best seen in Figure 7) extending from the surface 40 of the web 36, and shoulders 72 in the sheath 30, projecting from the ribs 66, latchingly interengage with a snap action (Figure 9) to restrain withdrawal of the frame 32 from the sheath 30. The shoulders 72 are spaced inwardly from the opening 10. As shown in Figure 7, the shoulders 70 on the web 36 are proximate to, but are spaced back from, the end 39 thereof. Each of the shoulders 70 and 72 has a ramp surface 74 for slidable engagement with the corresponding shoulder as the frame 32 is slid into the sheath 30. The ribs 66 flex as the opposed ramp surfaces 74 engage and pass over each other, and resile to an unflexed state when the frame 32 has been fully positioned in the sheath 30, as shown in Figure 9.

Spring biasing means in the form of an arcuate resilient bar 78 (best seen in Figure 4) act between the frame 32 and the sheath 30 to bias the frame 32 towards the plug receiving face 6 of the sheath 30, i.e. in the withdrawal direction. The bar 78, which is formed integrally with the frame 30, comprises a pair of normally curved cantilever springs 80 which extend transversely of the web 36 from a central axial extension 82 projecting from the end 38 of the web 36. The springs 80 have free ends 84, bearing surfaces 86 of which engage shoulders 88 proximate to the face 10 of the sheath 30 when the springs 80 are in a straightened and thus in a stressed condition, as best seen in Figure 11, whereby the shoulders 70 and 72 are urged against one another to restrain any relative axial movement between the sheath 30 and the frame 32.

The double-ended receptacle connector assembly 2 is arranged to receive plugs 90 and 91 (Figure 1) in accordance with United States Patent Specification No. 3,954,320.

A rib 96 is provided on the side wall 20 proximate to the face 8, a rib 96' being provided, as shown in Figure 12 on the side wall 18 proximate to the face 6, each such rib having a plug retaining shoulder 100. A ramp surface 97 is provided beside each rib 96 and 96'. As the plugs 90 and 91 are inserted into the sheath 30, flexible latches 94 on the plugs 90 and 91 are depressed by the ramps 97 and snap back, upon full insertion of the plugs 90 and 91, latchingly to engage behind the shoulders 100. Contacts (not shown) between ribs 93 on the housings of the plugs 90 and 91 then each engage one of the contact spring portions 46 and 47 of the contacts 34.

Both the sheath 30 and the frame 32, can be produced by simple injection moulding of thermoplastic material, for example a nylon composition. Moreover, both parts can be produced in straight-action moulds, that is to say, in moulds having core pins which extend only in

the direction of movement of the mould parts during opening and closing of the moulds.

The provision of only one rib 96 or 96' on each side wall 18 and 20 permits manufacture of the tubular sheath 30 by moulding plastics material about identical core pins 102, which are inserted from both ends of the sheath 30, as shown in Figure 12.

As shown in Figure 5, the frame 32 has recesses which extend only normally of the plane defined by the web 36, see also Figures 4 and 7, and there are no recesses or openings which extend transversely through the web 36 or the medial wall 52, in such a way as to require for their formation core pins extending normally of the direction of movement of the mould parts.

The core pins can thus be designed to extend through the mould cavity and engage each other when the mould is closed.

The use of a straight-action moulding technique reduces the production costs of the double-ended connector assembly.

The contacts 34 are stamped and formed from sheet metal for example brass, rather than being formed from wire, as is the common practice in the manufacture of receptacle connectors for use with plugs, such as the plugs 90 and 91. The contacts 34 can be assembled to the frame 32, therefore, simply by shearing the required number of contact blanks from a strip of flat stamped contact blanks, bending contact spring portions 46 and 47 from the blanks, normally of the intermediate portions 48 and inserting all of the blanks thus formed through the apertures 50. At the same time, the intermediate portions 48 are moved into the channels 49. The contact spring portions 36 and 47 are then bent inwardly until they are in the positions shown in Figure 5. Assembly of the frame 32 to the sheath 30 simply involves sliding the frame 32 axially into the sheath 30, with its end 39 leading, until the shoulders 70 and 72 snap into engagement with one another and the surfaces 86 of the springs 84 abut the shoulders 88 of the sheath 30.

Both the ribs 66 and the frame 32 may be resiliently deformable to achieve the snap action, or only the frame 32 may be resiliently deformable to achieve this. The sheath 30, as a whole may be resiliently deformable.

Claims

1. A double-ended electrical plug receptacle connector assembly (2) comprising; an insulating housing (30) having oppositely directed plug receiving faces (6 and 8), a plug receiving opening (10 and 12) in each such face (6 and 8), first and second opposed internal side walls (14 and 16) and third and fourth opposed internal side walls (18 and 20), extending between the plug receiving faces (6 and 8); and an elongate, contact carrying, insulating member (32) having first and second ends (38

and 39) each proximate to a respective one of the plug receiving faces (6 and 8), and first and second opposite surfaces (40 and 42) extending between its ends (38 and 39), the first opposite surface (40) facing the second internal side wall (16) of the housing (30) and the second opposite surface (42) being adjacent to the first internal side wall (14) of the housing (30), a plurality of juxtaposed electrical contacts (34) mounted on the contact carrying member (32) each comprising first and second contact spring portions (46 and 47) interconnected by an intermediate portion (48) and disposed between the first internal side wall (14) of the housing (30) and the first opposite surface (40) of the contact carrying member (32), each contact spring portion (46 or 47) extending from the first opposite surface (40) at a position proximate to a respective one of the plug receiving faces (6 and 8) and projecting obliquely inwardly away from such face (6 or 8) and towards the second internal side wall (16) for engagement by a contact element of an electrical plug (90 or 91) inserted through the plug receiving opening (10 or 12) of such face (6 or 8), characterised in that the housing is in the form of a tubular sheath (30) which has been moulded in one piece, and to which the contact carrying member (32) can be assembled by sliding it longitudinally into the sheath (30) through one (10) of the plug receiving openings (10 and 12), the sheath (30) having therein latching means (72) co-operating, with a snap action, with complementary latching means (70) on the contact carrying member (32), to restrain withdrawal of the contact carrying member (32) from the sheath (30) when the former has been slid home into the latter to an extent to position each first and second end (38 and 39) of the contact carrying member proximate to its respective plug receiving face (6 or 8), the latching means of the sheath (30) and of the contact carrying member (32) comprising shoulders (70 and 72) which abut one another when the contact carrying member (32) has been slid home into the sheath (30), the shoulders (70 and 72) then being urged into engagement with one another by spring means (78) acting between the contact carrying member (32) and an end surface (88) of the housing (30) adjacent to the one plug receiving opening (10), the spring means (78) which is provided on the first end (38) of the contact carrying member (32), which end trails during the insertion of the contact carrying member (32) into the sheath (30), comprising a pair of cantilever spring arms (80) extending in opposite directions transversely of the contact carrying member (32) each for engagement with a shoulder (88) formed within the sheath (30).

2. An electrical connector assembly according to Claim 1, characterised in that the third and fourth internal side walls (18 and 20) of the

the direction of movement of the mould parts during opening and closing of the moulds.

The provision of only one rib 96 or 96' on each side wall 18 and 20 permits manufacture of the tubular sheath 30 by moulding plastics material about identical core pins 102, which are inserted from both ends of the sheath 30, as shown in Figure 12.

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Both the ribs 66 and the frame 32 may be resiliently deformable to achieve the snap action, or only the frame 32 may be resiliently deformable to achieve this. The sheath 30, as a whole may be resiliently deformable.

Claims

1. A double-ended electrical plug receptacle connector assembly (2) comprising; an insulating housing (30) having oppositely directed plug receiving faces (6 and 8), a plug receiving opening (10 and 12) in each such face (6 and 8), first and second opposed internal side walls (14 and 16) and third and fourth opposed internal side walls (18 and 20), extending between the plug receiving faces (6 and 8); and an elongate, contact carrying, insulating member (32) having first and second ends (38

and 39) each proximate to a respective one of the plug receiving faces (6 and 8), and first and second opposite surfaces (40 and 42) extending between its ends (38 and 39), the first opposite surface (40) facing the second internal side wall (16) of the housing (30) and the second opposite surface (42) being adjacent to the first internal side wall (14) of the housing (30), a plurality of juxtaposed electrical contacts (34) mounted on the contact carrying member (32) each comprising first and second contact spring portions (46 and 47) interconnected by an intermediate portion (48) and disposed between the first internal side wall (14) of the housing (30) and the first opposite surface (40) of the contact carrying member (32), each contact spring portion (46 or 47) extending from the first opposite surface (40) at a position proximate to a respective one of the plug receiving faces (6 and 8) and projecting obliquely inwardly away from such face (6 or 8) and towards the second internal side wall (16) for engagement by a contact element of an electrical plug (90 or 91) inserted through the plug receiving opening (10 or 12) of such face (6 or 8), characterised in that the housing is in the form of a tubular sheath (30) which has been moulded in one piece, and to which the contact carrying member (32) can be assembled by sliding it longitudinally into the sheath (30) through one (10) of the plug receiving openings (10 and 12), the sheath (30) having therein latching means (72) co-operating, with a snap action, with complementary latching means (70) on the contact carrying member (32), to restrain withdrawal of the contact carrying member (32) from the sheath (30) when the former has been slid home into the latter to an extent to position each first and second end (38 and 39) of the contact carrying member proximate to its respective plug receiving face (6 or 8), the latching means of the sheath (30) and of the contact carrying member (32) comprising shoulders (70 and 72) which abut one another when the contact carrying member (32) has been slid home into the sheath (30), the shoulders (70 and 72) then being urged into engagement with one another by spring means (78) acting between the contact carrying member (32) and an end surface (88) of the housing (30) adjacent to the one plug receiving opening (10), the spring means (78) which is provided on the first end (38) of the contact carrying member (32), which end trails during the insertion of the contact carrying member (32) into the sheath (30), comprising a pair of cantilever spring arms (80) extending in opposite directions transversely of the contact carrying member (32) each for engagement with a shoulder (88) formed within the sheath (30).

2. An electrical connector assembly according to Claim 1, characterised in that the third and fourth internal side walls (18 and 20) of the



sheath (30) are provided provided with a groove (66) defined by a rib (66) projecting from such internal end wall (18 or 20) inwardly of the sheath (30) and extending between the plug receiving faces (6 and 8), each groove being dimensioned snugly to receive a rib (68) extending longitudinally of the adjacent edge of the contact carrying member (32), the shoulders (70 and 72) projecting from the ribs (66 and 68) and having complementary ramp surfaces (74) for engagement with one another resiliently to flex the rib (66) of the sheath (30), to permit engagement of the shoulders (70 and 72) as the contact carrying member (32) is slid home into the sheath (30).

3. An electrical connector assembly according to claim 1 or 2, characterised in that means (100) are provided in the sheath (30) for co-operation with a latch arm (94) on each plug (90 and 91) to retain the plug (90 or 91) in the sheath (30), such retaining means consisting of a first shoulder (100) on the third internal side wall (18) adjacent to the one plug receiving opening (10), and a second shoulder (100) on the fourth internal side wall (20) adjacent to the other plug receiving opening (12).

4. An electrical connector assembly according to any one of the preceding claims, characterised in that the contact carrying member (32) is formed with parallel channels (49) receiving the intermediate portions (48) of the contacts (34), these channels (49) extending in the insertion direction of the contact carrying member (32), each channel (49) communicating with a respective through aperture (38) in the contact carrying member (32) through which aperture (38) a respective one of the contacts (34) extends.

5. An electrical connector assembly according to any one of the preceding claims, characterised in that the contact carrying member (32) is provided with a medial wall (52) extending from its first opposite surface (40) towards the second internal side wall (16) of the sheath (30), in a plane substantially perpendicular to the internal side walls (14 and 16) thereof, the medial wall (52) having on opposite sides thereof a plurality of parallel barrier walls (52) extending towards the plug receiving faces (6 and 8) and receiving between them free ends (54) of the contact portions (46 and 47) of the contacts (34).

6. An electrical connector assembly according to Claims 1, 2 or 3, characterised in that the sheath (30) is resiliently deformed as the latching means (70 and 72) engage one another.

7. An electrical connector assembly according to any one of the preceding claims, characterised in that each of the tubular sheaths (30) and the contact carrying member (32) have been injection moulded by means of core pins extending through a mould cavity and engaging one another in the closed position of the mould.

Revendications

1. Ensemble (2) de connecteur femelle pour fiche électrique à double terminaison, comprenant un boîtier isolant (30) qui présente des faces opposées (6 et 8) de réception de fiches, une ouverture (10 et 12) de réception d'une fiche ménagée dans chaque face (6 et 8), des première et deuxième parois latérales internes opposées (14 et 16), et des troisième et quatrième parois latérales internes opposées (18 et 20), s'étendant entre les faces (6 et 8) de réception de fiches, et un élément isolant et allongé (32) de support de contacts, présentant des première et seconde extrémités (38 et 39) proches, chacune, de l'une, correspondante, des faces (6 et 8) de réception de fiches, et des première et seconde surfaces opposées (40 et 42) s'étendant entre ses extrémités (38 et 39), la première surface opposée (40) étant tournée vers la deuxième paroi latérale interne (16) du boîtier (30) et la seconde surface opposée (42) étant adjacente à la première paroi latérale interne (14) du boîtier (30), plusieurs contacts électriques juxtaposés (34) montés sur l'élément (32) de support de contacts comprenant chacun des première et seconde parties flexibles (46 et 47) de contacts reliées entre elles par une partie intermédiaire (48) et disposées entre la première paroi latérale interne (14) du boîtier (30) et la première surface opposée (40) de l'élément (32) de support de contacts, chaque partie flexible (46 ou 47) de contact s'étendant de la première surface opposée (40) en une position proche de l'une, correspondante, des faces (6 et 8) de réception de fiches et faisant saillie obliquement vers l'intérieur, en s'éloignant de cette face (6 ou 8) en direction de la deuxième paroi latérale interne (16) afin d'être engagée par un élément de contact d'une fiche électrique (90 ou 91) insérée dans l'ouverture (10 ou 12) de réception de fiches de cette face (6 ou 8), caractérisé en ce que le boîtier se présente sous la forme d'une gaine tubulaire (30) qui a été moulée d'une seule pièce et avec laquelle l'élément (32) de support de contacts peut être assemblé en étant glissé longitudinalement dans la gaine (30) par l'une (10) des ouvertures (10 et 12) de réception de fiches, la gaine (30) renfermant des moyens (72) de verrouillage qui coopèrent, par une action d'enclenchement élastique, avec des moyens complémentaires (70) de verrouillage, situés sur l'élément (32) de support de contacts, afin d'empêcher l'élément (32) de support de contacts d'être retiré de la gaine (30) lorsque cet élément est glissé en position dans la gaine sur une distance plaçant chacune des première et seconde extrémités (38 et 39) de l'élément de support de contacts à proximité de la face correspondante (6 ou 8) de réception d'une fiche, les moyens de verrouillage de la gaine (30) et de l'élément (32) de support de contacts, comprenant des épaule-



ments (70 et 72) qui butent l'un contre l'autre lorsque l'élément (32) de support de contacts a été glissé en position dans la gaine (30), les épaulements (70 et 72) étant alors sollicités pour porter l'un contre l'autre par des moyens élastiques (78) agissant entre l'élément (32) de support de contacts et une surface extrême (88) du boîtier (30) adjacente à la première ouverture (10) de réception d'une fiche, les moyens élastiques (78), qui sont prévus sur la première extrémité (38) de l'élément (32) de support de contacts, laquelle extrémité est située en arrière pendant l'insertion de l'élément (32) de support de contact dans la gaine (30), comprenant deux lames flexibles (80) en porte-à-faux qui font saillie dans des directions opposées, transversalement à l'élément (32) de support de contacts, afin de porter chacune contre un épaulement (88) formé à l'intérieur de la gaine (30).

2. Ensemble de connecteur électrique selon la revendication 1, caractérisé en ce que les troisième et quatrième parois latérales internes (18 et 20) de la gaine (30) présentent chacune une gorge (62) définie par une nervure (66) faisant saillie d'une paroi extrême interne (18 ou 20) vers l'intérieur de la gaine (30) et s'étendant entre les faces (6 et 8) de réception de fiches, chaque gorge étant dimensionnée pour recevoir étroitement une nervure (68) s'étendant longitudinalement au bord adjacent de l'élément (32) de support de contacts, les épaulements (70 et 72) faisant saillie des nervures (66 et 68) et présentant des surfaces complémentaires (74) en rampe destinées à porter l'une contre l'autre pour faire fléchir élastiquement la nervure (66) de la gaine (30), afin de permettre l'entrée en contact des épaulements (70 et 72) lorsque l'élément (32) de support de contacts est glissé en position à l'intérieur de la gaine (30).

3. Ensemble de connecteur électrique selon la revendication 1 ou 2, caractérisé en ce que des moyens (100) sont prévus sur la gaine (30) pour coopérer avec un bras (94) de verrouillage porté par chaque fiche (90 et 91) afin de retenir la fiche (90 ou 91) dans la gaine (30), ces moyens des retenues comprenant un premier épaulement (100) situé sur la troisième paroi latérale interne (18), à proximité immédiate de la première ouverture (10) de réception d'une fiche, et un second épaulement (100) situé sur la quatrième paroi latérale interne (20), à proximité immédiate de l'autre ouverture (12) de réception d'une fiche.

4. Ensemble de connecteur électrique selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément (32) de support de contacts est réalisé de façon à présenter des rainures parallèles (49) recevant les parties intermédiaires (48) des contacts (34), ces rainures (49) s'étendant dans la direction d'insertion de l'élément (32) de support de contacts, chaque rainure (49) communiquant avec une ouverture traversante respective (38) de l'élément (32) de support de

contacts, ouverture (38) à travers laquelle passe l'un, correspondant, des contacts (34).

5. Ensemble de connecteur électrique selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément (32) de support de contacts comporte une paroi médiane (52) faisant saillie de sa première surface opposée (40) en direction de la deuxième paroi latérale interne (16) de la gaine (30), dans un plan sensiblement perpendiculaire aux parois latérales internes (14 et 16) de celle-ci, la paroi médiane (52) portant, sur ses faces opposées, plusieurs parois parallèles (53) de séparation qui s'étendent vers les faces (6 et 8) de réception de fiches et qui reçoivent entre elles des extrémités libres (54) des parties (46 et 47) des contacts (34).

6. Ensemble de connecteur électrique selon les revendications 1, 2 ou 3, caractérisé en ce que la gaine (30) est déformée élastiquement en ce que la gaine (30) est déformée élastiquement lorsque les moyens de verrouillage (70 et 72) s'enclenchent mutuellement.

7. Ensemble de connecteur électrique selon l'une quelconque des revendications précédentes, caractérisé en ce que chacune des gaines tubulaires (30) et l'élément (32) de support de contacts ont été moulés par injection au moyen de broches de noyau passant dans une cavité de moule et s'appliquant l'une contre l'autre dans la position de fermeture du moule.

Patentansprüche

11. Elektrische Steckerbuchsenverbinderanordnung (2) mit Doppelanschluß, mit einem isolierenden Gehäuse (30), das entgegengesetzt gerichtete Steckeraufnahmeflächen (6 und 8) aufweist, eine Steckeraufnahmeöffnung (10 und 12) in jeder dieser Flächen (6 und 8), erste und zweite gegenüberstehende innere Seitenwände (14 und 16) und dritte und vierte gegenüberstehende innere Seitenwände (18 und 20), die sich zwischen den Steckeraufnahmeflächen (6 und 8) erstrecken, und mit einem langgestreckten, kontaktragenden, isolierenden Element (32) welches erste und zweite Enden (38 und 39) aufweist, die jeweils nahe einer der jeweiligen Steckeraufnahmeflächen (6 und 8) liegen, sowie erste und zweite entgegengesetzte Flächen (40 und 42), die sich zwischen seinen Enden (38 und 39) erstrecken, wobei die erste gegenüberliegende Fläche (40) der zweiten inneren Seitenwand (16) des Gehäuses (30) zugewandt ist und die zweite gegenüberliegende Fläche (42) in der Nähe der ersten inneren Seitenwand (14) des Gehäuses (30) angeordnet ist, wobei eine Vielzahl von nebeneinanderliegenden elektrischen Kontakten (34) auf dem kontaktragenden Element (32) angebracht sind, von denen jeder erste und zweite Kontaktfederabschnitte (46 und 47) aufweist, die mit einem Mittelabschnitt (48) miteinander verbunden sind und zwischen der ersten inneren Seitenwand (14) des Gehäuses



(30) und der ersten gegenüberstehenden Fläche (4) des kontakttragenden Elements (32) angeordnet sind, wobei sich ferner jeder Kontaktfederabschnitt (46 oder 47) von der ersten gegenüberstehenden Fläche (40) an einer Stelle in der Nähe einer jeweiligen Steckeraufnahme-
 fläche (6 und 8) erstreckt und schräg einwärts von dieser Fläche (6 oder 8) auf die zweite innere Seitenwand (16) hin wegragt, um mit einem Kontaktelement eines elektrischen Steckers (90 oder 91) in Eingriff zu treten, der durch die Steckeraufnahmeöffnung (10 oder 12) dieser Fläche (6 oder 8) eingesetzt ist, dadurch gekennzeichnet, daß das Gehäuse die Gestalt eines rohrförmigen, in einem Stück geformten Mantels (30) aufweist, mit dem das kontakttragende Element (32) dadurch zusammengebaut werden kann, daß es in Längsrichtung in den Mantel (30) durch eines (10) der Steckeraufnahmeöffnungen (10 und 12) eingeschoben wird, daß in dem Mantel (30) Verriegelungseinrichtungen (72) vorgesehen sind, welche mit Schnappfunktion mit komplementären Verriegelungseinrichtungen (70) an dem kontakttragenden Element (32) zusammenwirken, um das Herausziehen des kontakttragenden Elements (32) aus dem Mantel (30) zu verhindern, wenn dieses ganz in einem Maße hineingeschoben worden ist, daß jedes erste und zweite Ende (38 und 39) des kontakttragenden Elements in der Nähe seiner jeweiligen Steckeraufnahme-
 fläche (6 oder 8) positioniert ist, daß die Verriegelungseinrichtungen des Mantels (30) und des kontakttragenden Elements (32) Schultern (70 und 72) umfassen, die aneinander anstoßen, wenn das kontakttragende Element (32) in den Mantel (30) eingeschoben worden ist, daß die Schultern (70 und 72) dann in Eingriff miteinander durch Federeinrichtungen (78) gedrückt werden, die zwischen dem kontakttragenden Element (32) und einer Endfläche (88) des Gehäuses (30) in der Nähe der einen Steckeraufnahmeöffnung (10) wirken, daß die Federeinrichtung (78), die an dem ersten Ende (38) des kontakttragenden Elements (32) vorgesehen ist, wobei dieses Ende während des Einsetzens des kontakttragenden Elements (32) in den Mantel (30) hinten nacheilt, ein Paar von freikragenden Federarmen (80) umfaßt, die zum Eingriff mit einer innerhalb des Mantels (30) geformten Schulter (88) sich in entgegengesetzten Richtungen quer zum kontakttragenden Element (32) erstrecken.

2. Elektrische Verbinderanordnung nach Anspruch 1, dadurch gekennzeichnet, daß die dritte und die vierte innere Seitenwand (18 und 20) des Mantels (30) jeweils mit einer Nut (62) versehen sind, die durch eine Rippe (66) begrenzt wird, welche von dieser inneren Endwand (18 oder 20) einwärts des Mantels (30) ragt und sich zwischen den Steckeraufnahme-
 flächen (6 und 8) erstreckt, daß jede Nut derart

bemessen ist, daß sie knapp eine Rippe (68) aufnimmt, und sich in Längsrichtung zur benachbarten Kante des kontakttragenden Elements (32) erstreckt, daß die Schultern (70 und 72) von den Rippen (66 und 68) wegragen und komplementäre Rampenflächen (74) zum Eingriff miteinander aufweisen, um die Rippe (66) des Mantels (30) elastisch zu verbiegen, so daß der Eingriff der Schultern (70 und 72) ermöglicht wird, wenn das kontakttragende Element (32) in den Mantel (30) eingeschoben wird.

3. Elektrische Verbinderanordnung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß in dem Mantel (30) Mittel (100) zum Zusammenwirken mit einem Riegelarm (94) an jedem Stecker (90) und (91) vorgesehen sind, um den Stecker (90 oder 91) in dem Mantel (30) zu halten, daß die Haltmittel aus einer ersten Schulter (100) an der dritten inneren Seitenwand (18) in der Nähe der einen Steckeraufnahmeöffnung (10) bestehen, sowie aus einer zweiten Schulter (100) an der vierten inneren Seitenwand (20) in der Nähe der anderen Steckeraufnahmeöffnung (12).

4. Elektrische Verbinderanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das kontakttragende Element (32) mit parallelen Kanälen (49) versehen ist, welche die Mittelabschnitte (48) der Kontakte (34) aufnehmen, daß sich diese Kanäle (49) in der Einsetzrichtung des kontakttragenden Elements (32) erstrecken, daß jeder Kanal (49) mit einer entsprechenden Durchgangsöffnung (38) in dem kontakttragenden Element (32) in Verbindung steht, und daß sich durch diese Öffnung (38) jeweils einer der Kontakte (34) hindurcherstreckt.

5. Elektrische Verbinderanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das kontakttragende Element (32) mit einer Mittelwand (52) versehen ist, die sich von ihrer ersten gegenüberstehenden Fläche (40) zu der zweiten inneren Seitenwand (16) des Mantels (30) erstreckt, und zwar in einer Ebene, die sich im wesentlichen senkrecht zu seinen inneren Seitenwänden (14 und 16) erstreckt, und daß die Mittelwand (52) an gegenüberliegenden Seiten eine Vielzahl von parallelen Trennwänden (52) aufweist, die sich zu den Steckeraufnahme-
 flächen (6 und 8) erstrecken und zwischen sich freie Enden (54) der Kontaktabschnitte (46 und 47) der Kontakte (34) aufnehmen.

6. Elektrische Verbinderanordnung nach einem der Ansprüche 1, 2 oder 3, dadurch gekennzeichnet, daß der Mantel (30) elastisch verformt wird, wenn die Verriegelungseinrichtungen (70 und 72) miteinander in Eingriff treten.

7. Elektrische Verbinderanordnung nach einem der vorhergehenden Ansprüche, dadurch



gekennzeichnet, daß jeder der rohrförmigen Mänten (30) und die kontakttragenden Elemente (32) spritzgeformt sind, und zwar mittels Kernstiften, die sich durch einen Formhohl-

raum erstrecken und in der geschlossenen Stellung der Form miteinander in Eingriff stehen.

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