

Support body for an electrical contact arrangementDescription:

5 The invention relates to a support body for an electrical contact arrangement according to the preamble of patent claim 1.

 Such a support body is used to realize an electrical plug connection. For this purpose, the
10 support body is surrounded for example by an outer socket body, thereby forming an insertion opening for a corresponding plug. The support body in this case holds the contacts in the socket in such a way that they make reliable electrical contact with the contacts of the
15 plug. For reasons of compatibility, most of the electrical plug connections are standardized, so that the arrangement of the contacts is fixed in a defined manner.

 On account of magnetic and electrical coupling
20 between two contact pairs, one contact pair induces a current and/or influences electrical charges in neighboring contact pairs, resulting in crosstalk. In order to avoid near-end crosstalk, the contact pairs can be arranged such that they are very far removed
25 from one another, or a shield can be arranged between the contact pairs. However, if the contact pairs have to be arranged structurally very close together, the measures described above cannot be implemented and the near-end crosstalk must be compensated for.

30 A known method for reducing the near-end crosstalk in plug connections is targeted compensation behind the plug contacts. This is done by targeted additional coupling which, however, in contrast to the coupling in the contact region, constitutes an in-
35 antiphase component and thus reduces the overall crosstalk. For this purpose, a pair of lines are transposed in a targeted manner behind the plug contact, thereby producing additional in-antiphase coupling behind the crossover point.

This compensation method has the disadvantage that the contact length and/or the distance between contact center and the compensation location impose a physical limit for high frequencies on the extent of the compensation. For higher transmission rates, therefore, various contact arrangements for plugs and sockets have been proposed in which good compensation is achieved even for higher frequencies, without the contacts being transposed. Such an electrical contact arrangement is disclosed in DE 197 08 798.1-35, for example. The contact arrangements proposed in that case are structured in an extremely complex manner, since, on the one hand, the contact arrangement is defined in the connection region by standardizations such as, for example, of the RJ-45 plug connection, and, on the other hand, with regard to the contact arrangement of the socket, downward compatibility with respect to the previously used plugs is desired. This also requires specifically designed support bodies, which leads to higher manufacturing costs with regard to the production of the support bodies and the equipping of the support body with the associated contacts.

The invention is based on the technical problem, therefore, of providing a support body for an electrical contact arrangement of this type which can be produced in a cost-effective manner and can be equipped with the contacts in a simple manner.

The solution of the technical problem is afforded by the features of patent claim 1. The composition of the support body from individual elements which can be connected to one another enables the support body to be assembled for a specific contact arrangement. By means of standardized individual elements, it is then possible to assemble a respective support body modularly with regard to the number and arrangement of the contacts. In the case of injection-molding production of the support bodies, for example, this reduces the number of injection molds to the number of different individual elements. Furthermore,

the individual elements can be equipped more simply than a complex overall body. Further advantageous refinements of the invention emerge from the subclaims.

Preferably, each contact is assigned precisely one individual element, which enables clear equipping and prefabrication. In order to fasten a support body assembled in this way in a socket body, an individual element with latching means is in each case arranged laterally. The equipping of the individual elements with the contacts can be realized, in principle, by two different procedures. Either the respectively preformed contact is injection-molded during the production of the individual element; or the individual element is designed with guides into which the contact can be inserted or clamped into place. In order to reduce the production costs, it is preferable to use only a single individual element for the contacts, for which purpose said element is designed with a multiplicity of guides, of which only one guide in each case is used during the equipping operation. As a result, the support body can be assembled by means of only three different individual elements, namely one individual element for the contacts and the two lateral individual elements for the fastening of the support body in a socket body or the like. Furthermore, given a suitable choice of fastening means, the same individual element can be used for the two lateral regions, with the result that altogether only two different individual elements are required.

The invention is explained in more detail below using a preferred exemplary embodiment. The figures show:

- Figure 1 an exploded illustration of a support body for an RJ-45 socket,
- 35 Figure 2 an exploded illustration according to figure 1 from a different perspective,
- Figure 3 a support body for a vertical arrangement,

- Figure 4 a support body for a horizontal arrangement,
Figure 5 a socket body for a support body according to Figure 4,
5 Figures 6-8 a front view of an individual element with the contact inserted.

Figure 1 illustrates an exploded illustration of a support body 1 for an RJ-45 socket. The support body 1 comprises eight individual elements 2, which are
10 each equipped with a contact 3, and two further, laterally arranged individual elements 4, which close off the support body 1. The individual elements 2 carrying the contacts 3 are constructed completely uniformly and are designed with a multiplicity of
15 guides 5, three different guides 5 being provided in the contact region 7 and four different guides 5 in the connection region 6 of the contacts 3. Furthermore, each individual element 2 has, on the side with the guides 5, two fastening means which are designed as
20 knobs 8 and are aligned with blind holes 9 arranged on the other side of the individual element 2. The individual elements 4 which close off the support body 1 are designed with latching means 10 on the side areas pointing outward.

25 In order to assemble a complete support body 1, first of all the individual elements 2 are formed with in each case a specifically shaped contact, each contact 3 being assigned precisely one guide 5 in the connection region 6 and contact region 7. The contacts
30 3 can be bonded and clamped into the guides 5, but other types of fastening can also be used, in principle. The individual elements 2, 4 are then connected to one another by the knobs 8 being pressed into the blind holes 9 of a respectively neighboring
35 individual element 2, 4.

Instead of the knobs 8 and blind holes 9, the individual elements 2, 4 could be designed with continuous holes through which a cylindrical pin as toggle can then be guided for the purpose of assembly.

As an alternative, the individual elements 2, 4 may also be connected to one another in a non-releasable manner, for example by means of suitable adhesives. The advantage of a connection by releasable fastening means is afforded, however, particularly in the event of repairs in order, for example, to exchange a defective contact 3.

As an alternative to the guides 5, that side of the individual element 2 which carries the contact 3 can be designed with regularly arranged holding elements in a manner corresponding to a bed of nails, with the result that a contact can be arranged at any desired point between the holding elements. A further alternative consists in injection-molding the contacts 3 into the individual elements 2 during the production of the latter.

In Figure 3, the completely assembled support body 1 is arranged for vertical arrangement on a printed circuit board, for example. In order to fasten the support body 1 on a printed circuit board or the like, the individual elements 4 are additionally designed with clamping elements 11.

Figure 4 illustrates the completely assembled support body 1 for a horizontal arrangement in accordance with Figures 1 and 2. The support body 1 can then be inserted at the rear into a socket body 12 in accordance with Figure 5. The socket body 12 is designed with latching receptacles 13 corresponding to the latching means 10 of the individual elements 4. In the front region, the socket body 12 is designed with guides 14-16 for the support body of an RJ-45 plug. Furthermore, a clamping element 17 for fastening the socket body 12 or the socket formed by support body 1 and socket body 12 on a printed circuit board or the like is arranged on the underside of the socket body 12.

Figure 6 illustrates an individual element 2 with an inserted contact 3 for a vertical arrangement in accordance with Figure 3. The individual element 2

is designed with a multiplicity of guides 5, into which a respective contact 3 can be inserted. In the connection region 6, the individual element 2 has five guides 5, which are connected to the three guides in the contact region 7. As a result, the differently shaped contacts 3 which are to be arranged geometrically at different points can be aligned by means of a single individual element 2. Figures 7 and 8 each illustrate an individual element 2 with an inserted contact 3 for a horizontal arrangement in accordance with Figure 4. The five laterally arranged guides 5 are used in this case as guides 5 for the connection region 6, the allocation of the guides 5 in the contact region 7 remaining the same. Therefore, by means of a single individual element 2, the support body 1 for the RJ-45 socket can be constructed modularly with correspondingly arranged contacts 3, to be precise both for a vertical and for a horizontal arrangement of the socket. The form of the guides 5 is largely defined by the contact arrangement.

Patent Claims:

1. A support body for an electrical contact arrangement, comprising an electrically non-conductive
5 base body in which electrical contacts are arranged,
wherein
the support body (1) is modularly formed by a multiplicity of individual elements (2, 4), which can be joined together, the individual elements (2) being
10 designed such that they are or can be equipped with the contacts (3).
2. The support body as claimed in claim 1, wherein the individual elements (2, 4) are designed with fastening means (8, 9) for connection to the
15 neighboring individual elements (2, 4).
3. The support body as claimed in claim 1 or 2, wherein each contact (3) is assigned precisely one individual element (2).
4. The support body as claimed in one of claims 1 to 3, wherein the individual elements (4) which laterally delimit the support body (1) are designed with latching means (10), by means of which the support body (1) can be connected to a socket body (12) or plug body.
- 25 5. The support body as claimed in one of the preceding claims, wherein the individual elements (2) are designed with at least one guide (5), into which a respective contact (3) can be inserted.
6. The support body as claimed in one of claims 1 to 4, wherein the contacts (3) are injected-molded into the individual elements (2).
- 30 7. The support body as claimed in one of the preceding claims, wherein the individual elements (2) which carry the contacts (3) are of uniform design.
- 35 8. The support body as claimed in one of the preceding claims, wherein the fastening means are designed as knob (8) and blind hole (9).

This Sheet Has Been Replaced





- 8 -

9. A socket for an electrical plug connection, wherein the socket comprises a socket body (12), in which a support body (1) as claimed in one of the preceding claims is arranged.

This Sheet Has Been Replaced

