

Specification

The invention relates to a flat cable connector for connecting the conductors of a flat cable to a circuit board having at least one U-shaped cutting-type terminal contact which penetrates the insulation and which defines a slot between itself, having a socket contact which can be applied against the said cutting-type terminal contact and a pair of contact pins for mechanical and electrical connection to a circuit board, having a web which is formed on the cutting-type terminal contact at a right angle, and having a lug formed on the web for pressing onto the sheath of the flat cable.

Flat cable connectors for connecting the conductors of a flat cable to a cutting-type contact of U-shape which penetrates the insulation and defines a slot between itself and having a socket contact, which connects to said cutting-type contact, for mechanical and electrical connection to a contact pin or pair of contact pins connected to a circuit board having a web formed onto the cutting-type terminal contact at a right angle and a lug formed onto said web for pressing onto the sheath of the flat cable are known (WO A-79/01118). It is also known to connect cutting-type terminal contacts of the mentioned type to the individual conductors of the flat cable and then in a separate operation to insert these cutting-type terminal contacts into the drill-hole of a circuit board and thus to connect said circuit board electrically to the conductors of the flat cable (US-A-3 963 319). Also known is a flat cable connector which is connected by the cutting-type terminal contacts which displace the insulation to the individual conductors of a flat cable and are pushed using a slot provided at its other end over a circuit board. In the slot just mentioned there are leaf springs which bear against the two sides of the circuit board in a spring-mounted manner and at the same time make electrical contact (GB-A-2 037 494).

Starting from this state of the art, the invention is based on the object of designing a flat cable

connector in such a way that it can be connected simply and with few work steps both to the conductors of a flat cable and to a circuit board and thus connects these two parts electrically to one another. This connection should be impact- and vibration-resistant. The solution of this object is obtained with a flat cable connector of the generic type mentioned at the beginning in accordance with the invention in that the cutting-type terminal contact is arranged in a housing consisting of a bottom part and a top part, and the socket contact and the pair of contact pins are arranged in a third housing part, provided in the bottom part are openings for passing the socket contact and the pair of contact pins through for the purpose of bearing against the cutting-type terminal contact, and the housing is provided laterally with slots and the third housing part has terminals which can be passed through the said slots and can be locked thereto.

The flat cable connector is thus arranged in a multipart housing. The flat cable(s) is/are located in the housing consisting of a bottom and top part. In the latter, the conductors of the flat cable are inserted into the cutting-type terminal contacts and make electrical contact. The socket contact and the pair of contact pins are located in the third housing part. The latter is fitted with a simple movement onto the housing consisting of a bottom and top part and locked to the said housing by pushing its terminals through the openings of the said housing. In this way, an impact- and vibration-resistant connection is produced. The flat cable connector does not therefore have to be used in fixed and vibration-free systems alone. It can also be used in motor vehicles and in machines in which impacts and vibrations arise due to rotating parts or backwards and forwards movements. Once the connection has been made it is permanent and has a virtually infinite operating life.

The invention is now described in greater detail with reference to the example of the embodiments and applications shown in the drawings, in which:

Fig. 1 shows a perspective view of the flat cable

connector according to the invention viewed obliquely from the front,

Fig. 2 shows a perspective view of the same flat cable connector viewed obliquely from behind,

Fig. 3 shows a perspective view similar to that of Fig. 2 having lugs already bent over inwards,

Fig. 4 shows a side view, with cut conductors, of a flat cable with different sizes of its conductors,

Fig. 5 shows a side view, partially in section, of parts of a housing for connecting a flat conductor cable to a circuit board using the flat cable connector according to the invention,

Fig. 6 shows a side view, partially in section, of an associated housing part and of a circuit board,

Fig. 7 shows a side view, partially in section, of a housing for connecting two flat conductor cables using flat cable connectors according to the invention and

Fig. 8 shows a top view of the essential elements of the view in Fig. 7.

Figures 1 to 3 show the flat cable connector according to the invention, having the web 12, and the cutting-type terminal contacts 14 and 16 formed onto the two ends of said web. The said cutting-type terminal contacts consist in each case of the legs 18 having a slot 20 lying between them. All the legs 18 are pointed. The legs 18 are pressed in a known manner into the insulation of a flat cable. Figures 1 to 3 show an embodiment for splicing two flat cables. Lugs 22 are formed onto the two sides of the web 12. According to the illustration in Fig. 3, these lugs 22 are bent over inwards. In this arrangement, they bear from below and above against a flat cable and enclose it. In this way, the aforementioned permanent mechanical hold aimed for is obtained.

Figure 4 shows a flat cable 24 having a conductor 26 of greater cross-section and two conductors 28 of smaller cross-section. They are located in the sheaths 30 and 32 which are continuous with one another. The conductor of greater cross-section serves for transmitting

"power" current, whilst the conductors of smaller cross-section conduct control signals. Until the present invention, it was not known to produce such flat cables with conductors of differing cross-section with connectors of the generic type described here. Fig. 5 and Fig. 6 show such an application. Fig. 5 shows a housing consisting of a bottom part 34 and a top part 36. Openings 38 are provided in the floor of the bottom part 34. At the sides there are slots 40. Fig. 6 shows a third housing part 42. This has terminals 44. The said terminals are inserted into the slots 40. In the third housing part, a contact 46 which can be designed as a socket is held. In the third housing part there are also two contact pins 48 which form a pair. The contact 46 and the two contact pins 48 sit in soldering eyes of a circuit board 50. In the top housing part 36 there is a flat cable of the type shown in Fig. 4. In the housing part there are further flat cable connectors with cutting-type terminal contacts of differing sizes. A flat cable connector with large legs 18 bears against the large conductor 26. The legs 18 are pushed through the sheath 30. The lug 22 is bent over to the right and bears against the sheath 30 from above. On the right, Fig. 5 shows a corresponding diagram for the two smaller conductors 28. Here, flat cable conductors with smaller legs 18 are used. These are pressed through the sheaths 32. The lugs 22 are bent over again and bear against the sheaths 32 from above. To assemble the arrangement, the terminals 44 of the third housing part 42 are passed through the slots 40. At the same time, the housing parts lock with one another. In this assembled state, the contact 46 and the contact pins 48 bear against the legs 18 assigned to them and make electrical contact with said legs. As a result, the conductors 26 and 28 are electrically connected to the conductor tracks (not shown) located on the circuit board 50. This electrical contact is maintained even in the event of vibrations. The lugs 22 bent over onto the flat cable prevent the legs 18 from being released from the flat cable.

The cross-section in Fig. 7 and the top view in Fig. 8 show a cable branching. Here too, the cutting-type terminal contacts 14 and 16 are pushed into the flat cable from one side, and the lugs 22 are pressed onto it from the other side.



Claim

A flat cable connector for connecting the conductors (26, 28) of a flat cable (24) to a circuit board (50), having at least one U-shaped cutting-type terminal contact (14, 16) which penetrates the insulation and which defines a slot (20) between itself, having a socket contact (46) which can be applied against the said cutting-type terminal contact and a pair of contact pins (48) for mechanical and electrical connection to a circuit board (50), having a web (12) which is formed on the cutting-type terminal contact (14, 16) at a right-angle, and having a lug (22) formed on the web for pressing onto the sheath (30, 32) of the flat cable (24), characterized in that the cutting-type terminal contact (14, 16) is arranged in a housing consisting of a bottom part (34) and a top part (36), and the socket contact (46) and the pair of contact pins (48) are arranged in a third housing part (42), provided in the bottom part (34) are openings (38) for passing therethrough the socket contact (46) and the pair of contact pins (48) for the purpose of bearing against the cutting-type terminal contact (14, 16) and the housing is provided laterally with slots (40) and the third housing part has terminals (44) which can be passed through said slots and can be locked thereto (44).



As printed

Claim

A flat cable connector for connecting the conductors (26, 28) of a flat cable (24) to a conductor board (50), comprising at least one U-shaped cutting-type terminal contact (14, 16) which penetrates the insulation and which defines a slot (20) between itself, comprising a socket contact (46) which can be applied against the cutting-type terminal contact and a pair of contact pins (48) for mechanical and electrical connection to a circuit board (50), comprising a limb portion (12) which is formed on the cutting-type terminal contact (14, 16) at a right angle, and comprising a lug (22) formed on the limb portion for pressing on to the sheath (30, 32) of the flat cable (24), characterized in that the cutting-type terminal contact (14, 16) is arranged in a housing comprising a bottom portion (34) and a top portion (36) and the socket contact (46) and the pair of contact pins (48) are arranged in a third housing portion (42), provided in the bottom portion (34) are openings (38) for passing therethrough the socket contact (46) and the pair of contact pins (48) for the purposes of bearing against the cutting-type terminal contact (14, 16), and the housing is provided laterally with slots (40) and the third housing portion has terminals (44) which can be passed through same and which can be locked thereto.

Revendication

Connecteur pour câbles plats destiné à connecter les conducteurs (26, 28) d'un câble plat (24) à une plaquette à circuit imprimé (50) comportant au moins un contact de serrage coupant (14, 16) de forme en U, définissant une fente (20) et perçant l'isolation, un contact à douille (46) pouvant être appliqué contre le contact de serrage coupant et une paire de broches de contact (48) servant à la connexion mécanique et électrique à une plaquette à circuit imprimé (50), une âme (12) formée à angle droit sur le contact de serrage coupant (14, 16) et une patte (22) formée sur cette âme pour engager, par pression, les gaines (30, 32) du câble plat (24), caractérisé en ce que le contact de serrage coupant (14, 16) est logé dans un boîtier formé d'une partie inférieure (34) et d'une partie supérieure (36), et le

(46) ainsi que la paire de broches de contact (48) sont logés dans une troisième partie de boîtier (42) et la partie inférieure (34) du boîtier présente des ouvertures (38) pour le passage du contact (46) et de la partie de broches de contact

(48) en vue de leur application contre le contact de serrage coupant (14, 16), le boîtier présentant des fentes latérales (40) et la troisième partie du boîtier, des pinces (44) pouvant être enfoncées dans ces fentes et être verrouillées à celle-ci.