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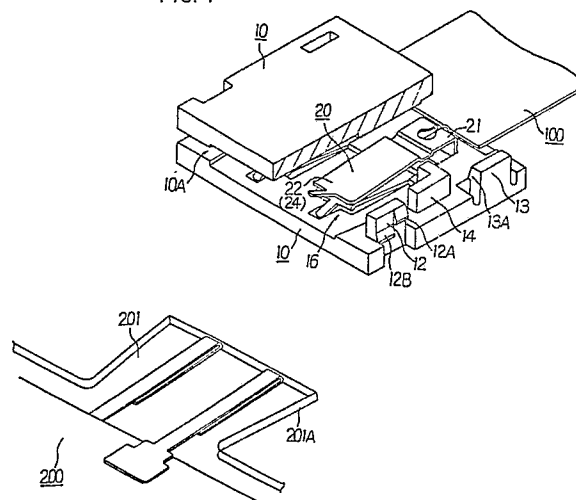
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54 Electrical connector for connecting flat electronic components.

57 An electrical connector is provided for connecting flat-type components such as an electroluminescent panel and a flexible strip jumper. The connector comprises a pair of housings (10) arranged to be moved from a first pre-locking position to a second locking position. A contact (20) is clamped between the housings (10). The contact (20) having a first connecting portion (21) to be connected to the flexible jumper (100) or the like and a second connecting portion (22) to be connected to the electroluminescent panel (200) or the like. The housings (10) are formed such that in the pre-locking position a gap (10A) is included into which the panel (200) is inserted for subsequent clamping by the contact (20) when the housings (10) are moved to their fully locked position. The flexible jumper (100) wire is connected, for example, through a conductive pin (101) by a pressing arrangement (23) in the other end of the electrical contact.

FIG. 1



Description

ELECTRICAL CONNECTOR FOR CONNECTING FLAT ELECTRONIC COMPONENTS

Technical Field

The present device relates to a connector for connecting flat-type electronic parts (including flexible strips, jumpers, display panels, and the like).

Background of the Invention

For example, when an Electro Luminescent (EL) panel is connected to its control board, components such as a jumper are required in order to adjust a distance therebetween. However, the prior art cannot satisfactorily meet such requirement.

Summary of the Invention

The present device has been made in consideration of the above situation and has as its object to provide a connector capable of electrically and mechanically connecting an electronic device such as an EL to a board to be connected with ease and high reliability.

The present device is a connector comprising a pair of opposing housings movably arranged in the opposing direction, and a contact clamped between the housings to be fixed thereby, the contact having a first connecting portion to be connected to a first member to be connected, and a second connecting portion to be connected to a second member to be connected, and the pair of housings being movable from a pre-locking position for forming a gap in which one of the first and second members to be connected is inserted to be connected to a corresponding one of the first and second connecting portions of the contact to a full-locking position for clamping and fixing the contact.

Brief Description of the Drawings

Fig. 1 is a partially cutaway perspective view showing a state of a connector in use according to an embodiment of the present device.

Figs. 2A and 2E are sectional views showing the steps of connecting the connector according to the embodiment and a member to be connected.

Detailed Description of the Preferred Embodiment

In Fig. 1, reference numeral 10 denotes a pair of opposing insulative housings (having the same shape) movably arranged in the opposing directions; and 20, a contact which is clamped between the housings to be fixed thereby.

A plurality of contacts are arranged. Each contact has a first connecting portion 21 (see Fig. 2A described later for details of the contact) to be connected to a first member to be connected 100 (for example, a flexible strip jumper is illustrated), and a second connecting portion 22 to be connected to a second member to be connected 200 (for example, an EL is illustrated). The first and second connecting portions are coupled by a coupling portion 26.

As can be seen from Fig. 2A, the distal end of the first connecting portion of the contact forms an urging portion having a substantially U-shaped section. The urging portion 23 has a circular window hole and a groove (smaller than the diameter of a pin) communicating therewith, as shown in Fig. 2A. A pin-like connecting end 101 of the jumper as the first member to be connected is inserted from the window hole, and is pressed into the groove, thus clamping and fixing (pressing) the pin by the two side portions defining the groove.

The second connecting portion of the contact has a pair of leaf springs 24 for clamping a flat connecting end 201 of the second member to be connected. Open guide tips 25 extend from these leaf springs. The guide tips serve as guides for allowing the second member to be connected to be inserted between the leaf springs.

At least one groove 26A is formed in the coupling portion of the contact to extend therealong.

A surface of each housing has a recess portion 16 for receiving the connecting end of the second member to be connected, and also has a plurality of recess portions 11 for installing contacts therein. Note that two side edges 201 of the connecting end of the second connecting member are inclined, and the inner wall of the recess portion 16 of each housing is also inclined correspondingly. Thus, the connecting end of the EL mounted on the connector is not easily pulled out.

A pair of retainer blocks 12 and 13 are formed on the two edges of the surface of each housing. Engaging projections 12A and 12B are formed at different positions on one retainer block 12. A hook 13A locked with the engaging projections of the opposite housing is formed on the other retainer block 13.

An L-shaped stopper block 14 for defining the position of the second member to be connected when the latter is inserted into the housing is formed on the surface of each housing.

A projection 15 is formed at a position on the surface of each housing corresponding to the groove 26A of the coupling portion when the contact is placed in the recess portion.

The steps of assembling the connector according to the embodiment shown in Fig. 1 will be described below with reference to Fig. 2.

The pin of the connecting end of the strip jumper is urged in the first connecting portion of each contact. The contact connected to the jumper is placed in the recess portion 11 of one housing (see Figs. 2A and 2B). Note that a groove having a shape corresponding to the guide tips 25 of the contact is formed in the surface of each housing. The guide tips are placed in this groove, so that the contact main body can be prevented from being disengaged from the housing, and the contact is positioned to be correctly received at the predetermined position of the housing.

The other housing is capped on the housing in

which the contact is placed, and at the same time, the hook 13A of the retainer block 13 of one housing is engaged with the engaging projection 12A (located at a higher level) of the retainer block 12 of the other housing. In this case, both the housings are not fully fitted, and a gap 10A is formed therebetween (see Fig. 2C; in this case, the housings are located at a pre-locking position). In this state, when the connecting portion 201 of the EL is inserted between the housings through the gap 10A, it is guided by the guide tips 25 of the contact and is clamped between the leaf springs 24 of the contact. In this case, since the effective length of the leaf springs is large, an insertion resistance is small. A film-like electrode of the EL is formed by folding the connecting end of the EL, and is exposed outside to form a contact (contacting portion). Thus, the contact of the connector and the contact as the electrode of the EL are brought into contact with each other and are electrically connected to each other (see Fig. 2D).

Both the housings are clamped from the outside and are applied with a collapsing force. Thus, the hook 13A of the retainer block of one housing is engaged with the engaging projection 12B at the lower level of another retainer block 12 of the other housing. As a result, both the housings are perfectly locked (i.e., the housings are at the full-locking position) (see Fig. 2E). Both the housings function to urge the guide tips 25 of the contact, and a pressing force of the housing lock is applied to the connecting portion of the EL, thus reliably assuring a contact pressure. The projection 15 projecting from the surface of the housing is fitted in the groove 26A of the coupling portion of the contact. Therefore, a variation in thickness of the EL can be absorbed. In the full-locking state of the housings, the connecting end of the EL is reliably fitted in the recess portions 16 of the housings, and the two inclined side portions of the connecting end are reliably engaged with the inclined inner wall of the recess portion. Thus, the EL cannot be easily pulled out from the housings.

A case has been explained wherein the EL and the jumper wiring are connected according to this device. However, the present device is not limited to this, but can be used for connecting a flat cable, a display panel, and the like. The assembly process is not limited to the above embodiment. For example, after the contact is mounted in the housings, the two members to be connected are inserted in and pressed by the connecting portion of the contact.

The structure of the connector according to the present specification has been described. With this structure, the following effects can be provided.

In the connector according to the present device, a pair of housings are movably arranged from a pre-locking position for receiving a member to be connected to a full-locking position for perfectly connecting the member to be connected. Therefore, a special-purpose actuator is not required, and the member to be connected can be reliably connected with a simple structure.

The present device allows connection which cannot be achieved by the prior art such that one

connecting portion of the contact is arranged to press a jumper wire, and the other connecting portion is arranged to clamp the connecting end of an EL.

Claims

1. A connector comprising a pair of opposing housings 10 movably arranged in the opposing direction, and a contact 20 clamped between said housings to be fixed thereby, said contact having a first connecting portion 21 to be connected to a first member to be connected 100, and a second connecting portion 22 to be connected to a second member to be connected 200, and said pair of housings being movable from a pre-locking position for forming a gap 10A in which one of said first and second members to be connected is inserted to be connected to a corresponding one of said first and second connecting portions of said contact to a full-locking position for clamping and fixing said contact.

2. A connector according to claim 1, wherein said pair of housings have the same shape, and each of said housings has a recess portion 11 for installing said contact therein, and engaging means engaged with the opposite housing to form the pre- and full-locking positions.

3. A connector according to claim 2, wherein said engaging means of said contact has a pair of retainer blocks 12 and 13 at two sides of each of said housings, one retainer block 12 having engaging projections 12A and 12B formed at different positions, and the other retainer block 13 having a hook 13A locked with the engaging projections of the opposite housing.

4. A connector according to any one of Claims 1 to 3, wherein each of said housings has an L-shaped block 14 for defining a position when said member to be connected is inserted in said housing at the first locking position.

5. A connector according to any one of Claims 1 to 4, wherein said first connecting portion of said contact forms an urging portion 23 for allowing a pin-like connecting end 101 to be inserted therethrough.

6. A contact according to any one of Claims 1 to 5, wherein said second connecting portion of said contact has clamping means having a leaf spring 24 for clamping a flat connecting end 201 of said second member to be connected.

7. A contact according to claim 6, wherein said clamping means has a guide tip 25 for guiding the connecting end of said second connected portion at its distal end.

8. A connector according to any one of Claims 1 to 7, wherein said first and second connecting portions of said connector are coupled by a coupling portion 26, said coupling portion has at least one groove 26A extending therealong, and each of said housings has a

projection 15 corresponding to said groove.

9. A connector according to any one of Claims 1 to 8, wherein said second member to be connected has a connecting end having an edge 201A inclined toward two side portions, and each of said housings has a recess portion

16, having an inclined inner wall corresponding to said inclined edge of said connecting end, for receiving said connecting end of said second member to be connected.

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FIG. 1

