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Kennedy

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[54] **ELECTRICAL TERMINAL**

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[52] **U.S. Cl.** .....**339/258 R**

[51] **Int. Cl.** **H01r 13/12**

[58] **Field of Search**.....339/256, 258, 259, 176

[56] **References Cited**

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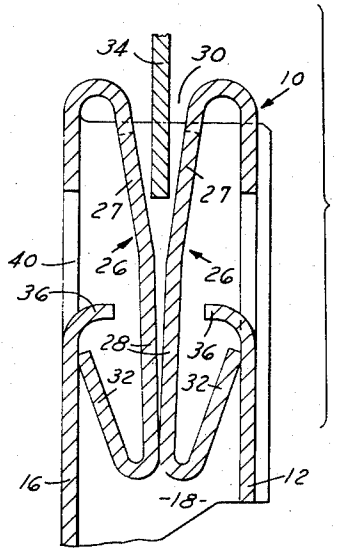
[57] **ABSTRACT**

A female electrical terminal for receiving a blade terminal is disclosed. The main elements forming the female terminal are first, second, third and fourth walls which are joined together into an integral unit at edges between the first and the second, the second and the third, and the third and the fourth walls. A cooperable lock device is formed, in part, on a free end of the first wall and, in part, on a free end of the fourth wall. The cooperable lock device locks the walls into a closed configuration to define therein an interior volume in which the first and the third walls are in facing relationship and the second and the fourth walls are in a facing relationship. Individual ones of a pair of terminal elements are formed integrally from respective ones of a pair of facing walls. Each of the terminal elements is folded back from its point of attachment to the wall into the interior volume of the terminal to form a main blade terminal contacting portion which is resiliently deflectable when engaged by an inserted blade terminal.

9 Claims, 4 Drawing Figures



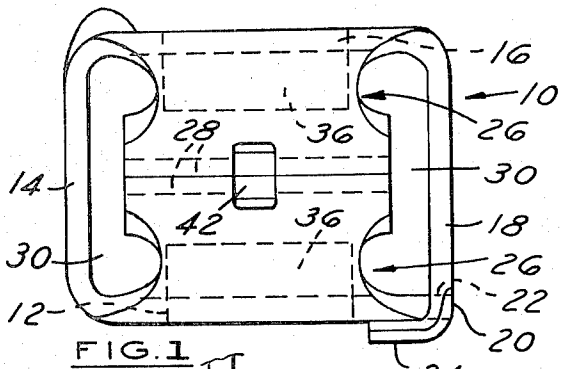


FIG. 1

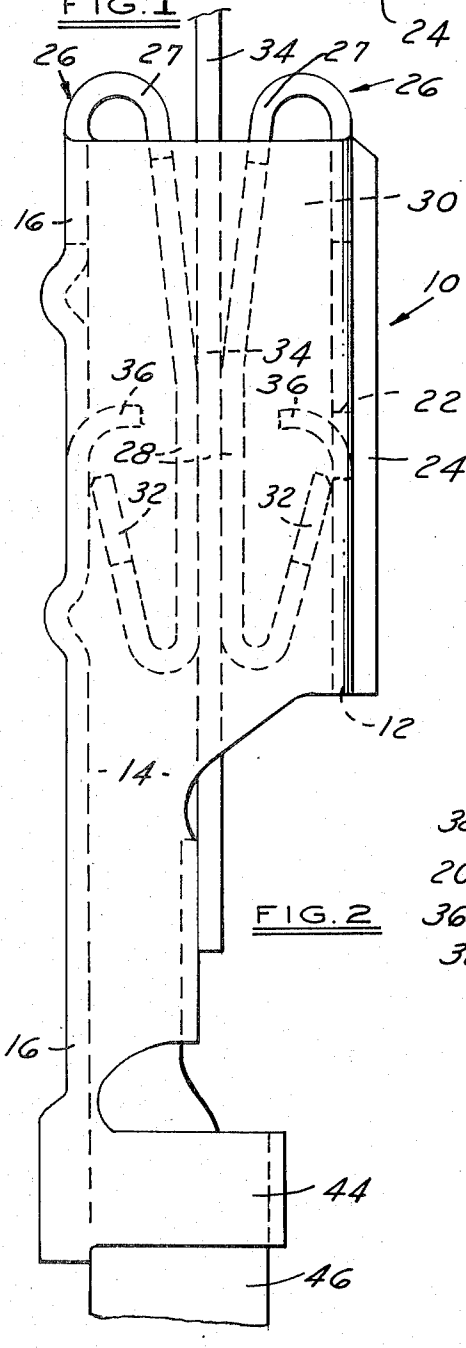


FIG. 2

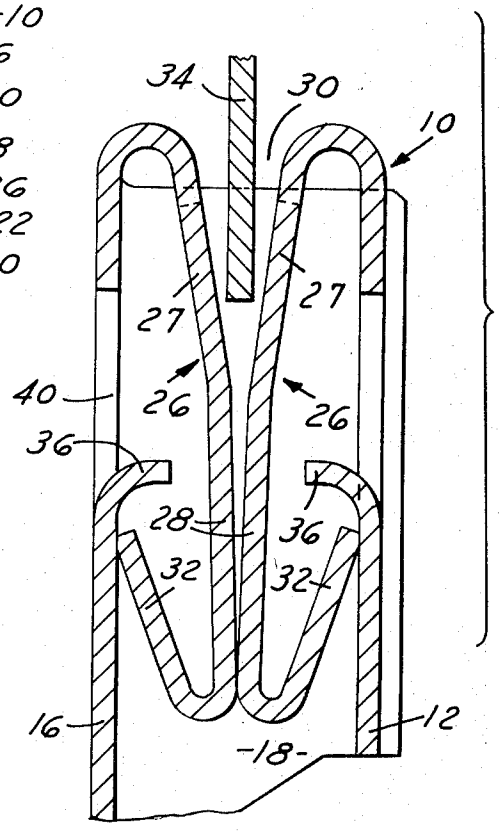


FIG. 3

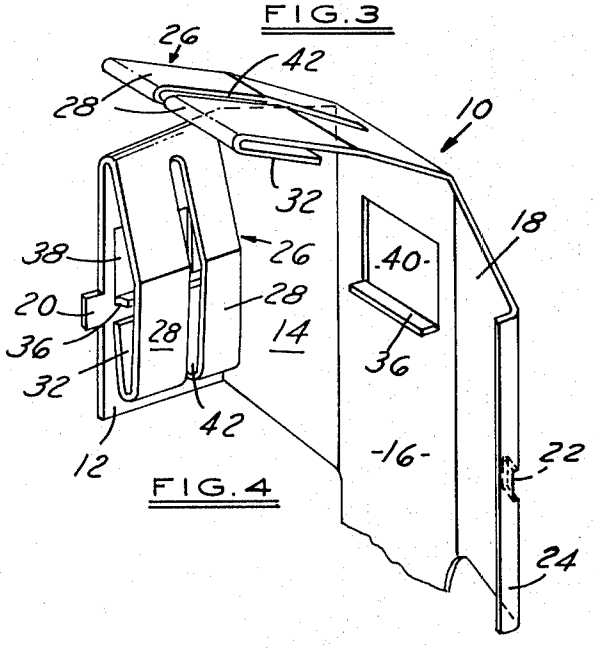


FIG. 4

ELECTRICAL TERMINAL

BACKGROUND OF THE INVENTION

The prior art teaches many electrical terminal constructions for electric terminals of a female type which accept a blade terminal therein. Many of the electrical terminals of this general type are designed to be mounted in an assembly operation along with other similar terminals in a terminal block thereby to form an electrical connector.

It is a general purpose of this invention to provide a female electrical terminal which is designed to be stronger than known prior art female terminals. The construction features of the female terminal of this invention are such that the terminal may be inserted into a terminal block to form an electrical connector without fear that the internal, operative portions of the terminal will be damaged by such a connector assembly operation. The female terminal of this invention also is designed so that it may receive a blade electrical terminal therein in such a manner that a uniform, positive gripping pressure is applied to the blade terminal by the internal operative portions of the female terminal.

SUMMARY OF THE INVENTION

This invention relates to an electrical terminal and, more particularly, to a female electrical terminal for receiving a blade terminal therein.

In accordance with the teachings of this invention, a female electrical terminal for receiving a blade terminal therein includes the following general structure. First, second, third and fourth walls are provided to define upper and lower walls and a pair of side walls for the electrical terminal. The walls are integrally joined along edges between the first and the second wall, between the second and third wall, and between the third and the fourth wall. A cooperable lock device is formed, in part, on a free end of the first wall and, in part, on a free end of the fourth wall. This lock device locks the four walls into a closed configuration defining an interior volume in which both the upper and the lower walls and the side walls are in facing relationship. Individual ones of a pair of terminal elements are formed integrally from each of a pair of facing walls. Each terminal element is folded from its point of attachment to its associated wall into the interior volume of the terminal to form a main blade terminal contacting portion. This contacting portion is resiliently deflectable when engaged by a blade terminal inserted into the interior volume of the electrical terminal.

In accordance with more detailed aspects, the female terminal of this invention may also include the following structural features. Each of the pair of terminal elements may have an additional portion which is folded back between the main terminal contacting portion thereof and the wall from which it is integrally formed. This folded back portion of the terminal element can be brought into engagement with its associated wall to give added flexibility and spring action to the terminal element when a blade terminal is inserted into the interior volume of the female terminal. The female terminal of the invention may also be formed so as to have a stop element which limits the resilient travel of the main blade terminal contacting portion of the terminal element. Also, each of the terminal elements may be bifurcated along a major portion of their length so as to provide uniform gripping pressure on the blade terminal brought into contact therewith.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view of an electrical terminal constructed in accordance with the teachings of this invention.

FIG. 2 is a side elevation view of the left hand side of the electrical terminal shown in FIG. 1.

FIG. 3 is a cross section view showing some of the internal structure of the terminal.

FIG. 4 is a perspective view showing the electrical terminal in an unfolded condition wherein the various details of the structure are shown.

DESCRIPTION OF THE PREFERRED EMBODIMENT

CONSTRUCTION

The female electrical terminal of this invention is generally identified by the numeral **10** in the drawings. The electrical terminal has a first wall **12**, a second wall **14**, a third wall **16**, and a fourth wall **18** (FIG. 4). All of these walls are formed as an integral unit by being joined together along edges thereof between the first and the second walls, between the second and the third walls, and between the third and the fourth walls.

A cooperable locking device is formed integrally with the terminal **10**. This device includes a tab **20** extending from a free end of the first wall **12** and an opening **22** in a lip portion **24** formed on the free end of the fourth wall **18** (FIG. 4). When the tab **20** is snapped into the opening **22**, the electrical terminal has its four walls formed into a closed rectangular configuration whereby the first and the third walls **12** and **16** respectively define a pair of facing upper and lower walls (FIG. 1) and the second and the fourth walls **14** and **18** define a pair of facing side walls.

Electrical terminal elements, generally identified by the numeral **26**, are formed integrally with and extend from the upper wall **16** and the lower wall **12**. Each terminal element is of the same general configuration. As may best be understood by reference to FIGS. **3** and **4**, each element is folded back from its point of attachment to its associated wall to form both a closed entry portion **27** and a main terminal contacting portion **28** within an interior volume **30** of the terminal **10**.

Each of the electrical terminals **26** may also have a folded back portion **32** (FIG. 3) having a free end which engages the associated wall from which the terminal element is integrally formed. This engagement gives added flexibility and spring action to the terminal elements **26** when a blade terminal **34** (FIG. 2) is inserted therebetween. The folded back portion **32** acts to provide a spring force on the inserted terminal **34** along the entire length of the main terminal contacting portions **28** thereby giving a uniform contact pressure along the entire length of the blade terminal.

A stop element **36** is formed as a lip turned up from an opening **38** in the first wall **12** and an opening **40** in the third wall **16**. The stop elements **36** may be formed integrally with the formation of the walls and the electrical terminals as, for example, in a sequential stamping operation wherein suitable electrically conductive material is formed into the terminal **10**. The stop ele-

ments are provided for limiting the resilient travel of the main terminal contacting portions 28 of the terminal elements 26 within the interior volume 30 of the terminal.

As may best be seen in FIGS. 1 and 4, the terminal elements 26 are bifurcated by a slot 42 along a major portion of their lengths. This bifurcation of the terminal elements allows a uniform gripping pressure to be applied by the terminal contacting portions 28 thereof on the blade terminal 34 when inserted therebetween.

As seen in FIG. 2, a lower portion of the third wall 16 of the terminal 10 is formed to have wire gripping elements 44 thereon. This wire gripping elements engage and make electrical contact with electrical wires 46 from a suitable electrical lead. The termination of the terminal to the wires 46 is accomplished in a standard manner.

OPERATION

The female terminal 10 of this invention is designed to receive the blade terminal 34 therein as is illustrated in FIG. 2. The blade terminal 34 is inserted between opposed terminal elements 26 to engage initially the closed entry portions 27 and then the terminal contacting portions 28 of the elements. Because the closed entry portions 27 are spaced apart along their initial portions a distance greater than the thickness of the inserted blade terminal, the blade terminal is easily captured in the terminal 10 and the final insertion pressure does not have to be high. The engaged portions of the elements are deflected within the interior volume 30 of the terminal 10. The deflection of the terminal elements builds up a spring force between the folded back portions 32 of the elements and their associated engaged walls. By such action, a positive gripping pressure is applied to the blade terminal 34 by the main contacting portions 28 of the terminal elements 26 to insure good electrical contact therewith. The bifurcation of the terminal elements permits a uniform side-to-side contact pressure to be exerted on the inserted blade terminal. Also, since the four walls of the terminal 10 are locked together into an integral unit, rigidity is provided to the entire structure and repeated insertion and removal of the blade terminal 34 from the terminal elements 26 does not cause substantial changes in the electrical characteristics of the electrical junction formed therebetween.

The construction of an electrical terminal of the female type has been disclosed herein. Modifications of the terminal's construction which do not depart from the spirit and scope of this invention will be obvious to those skilled in the art in view of this disclosure. It is intended that all such constructions be included within the terms of the appended claims.

What I claim is:

1. An electrical terminal for receiving a blade terminal, which electrical terminal comprises:

first, second, third and fourth wall means for defining upper and lower walls and a pair of side walls for the electrical terminal, said wall means being joined along edges between said first and said second wall means, between said second and said third wall means, and between said third and said fourth wall means;

cooperable lock means formed in part on a free end of said first wall means and in part on a free end of said fourth wall means for locking said wall means into a closed configuration defining an interior volume wherein said upper and said lower walls are in facing relationship and side walls are in facing relationship;

terminal means extending from each of a facing pair of said wall means into said interior volume of said wall means, said terminal means for making electrical contact with a blade terminal inserted into said interior volume.

2. An electrical terminal for reception of a blade terminal, which electrical terminal comprises:

first, second, third and fourth integrally formed wall means for defining upper, lower and a pair of side walls for the electrical terminal, said side wall means being joined along edges between said first and second wall means, said second and third wall means, and said third and said fourth wall means;

cooperable lock means formed in part on a free end of said first wall means and in part on a free end of said fourth wall means for locking all of said wall means into a fixed structure with an interior volume defined between facing upper and lower wall means and facing side wall means;

a pair of terminal elements formed individually on and integrally with each of a pair of facing wall means, each of said terminal elements being folded from its point of attachment to said wall means into said interior volume between said wall means to form a main terminal contacting portion which is resiliently deflectable when engaged by the blade terminal when inserted into said interior volume.

3. An electrical terminal as defined in claim 2 wherein: each of said pair of terminal elements have a portion thereof which is folded back between said main terminal contacting portion of said terminal element and said wall defining means from which it is integrally formed.

4. The electrical terminal as defined in claim 3 wherein: each of said folded back end portions of each of said terminal elements engages its said associated side wall means to give added flexibility and spring action to said terminal elements when a blade terminal is inserted into said interior volume of said terminal.

5. The electrical terminal as defined in claim 4 wherein: integral stop means are provided on each of said associated wall means having a terminal element formed therefrom, said stop means for limiting the resilient travel of said main terminal contacting portions of said terminal elements within said interior volume of said terminal.

6. The electrical terminal as defined in claim 5 wherein: said stop means is in the form of a lip formed integrally with and turned up from said associated wall means into said interior volume of said terminal.

7. The electrical terminal as defined in claim 6 wherein: each of said terminal elements is bifurcated along at least a major portion of its length to provide uniform gripping pressure on a blade terminal inserted therebetween.

8. The electrical terminal as defined in claim 2 wherein: said cooperable lock means includes a tab ex-

tending from the free end of said first wall means and a receiving opening formed in said fourth wall means, said tab being snapped into said opening to lock said wall means into said terminal.

9. The electrical terminal as defined in claim 2 wherein: each of said pair of terminal elements have a closed entry portion prior to said main terminal contacting portions thereof.

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