United States Patent [19]

Hecht

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[54] **ADAPTOR**

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[52] **U.S. Cl.** ..... **339/156 A**, 339/195 M, 339/276 A

[51] **Int. Cl.** **H01r 5/08**, H01r 13/50

[58] **Field of Search** ..... 339/17, 156 R, 156 A, 339/157 R, 176 M, 176 MF, 176 MP, 195, 221 M, 276 A

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Assistant Examiner—Lawrence J. Staab
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[57] **ABSTRACT**

An adaptor for use with a high contact density connector to permit use of wire wrap posts in conjunction with the connector, the adaptor being defined by support means characterized by a generally planar member having a plurality of spaced openings extending therethrough with wire wrap posts being supported in the planar member and disposed in the openings thereof, said wire wrap posts being engageable with the terminal tails of the contacts of the connector and thereafter soldered thereto.

1 Claim, 5 Drawing Figures

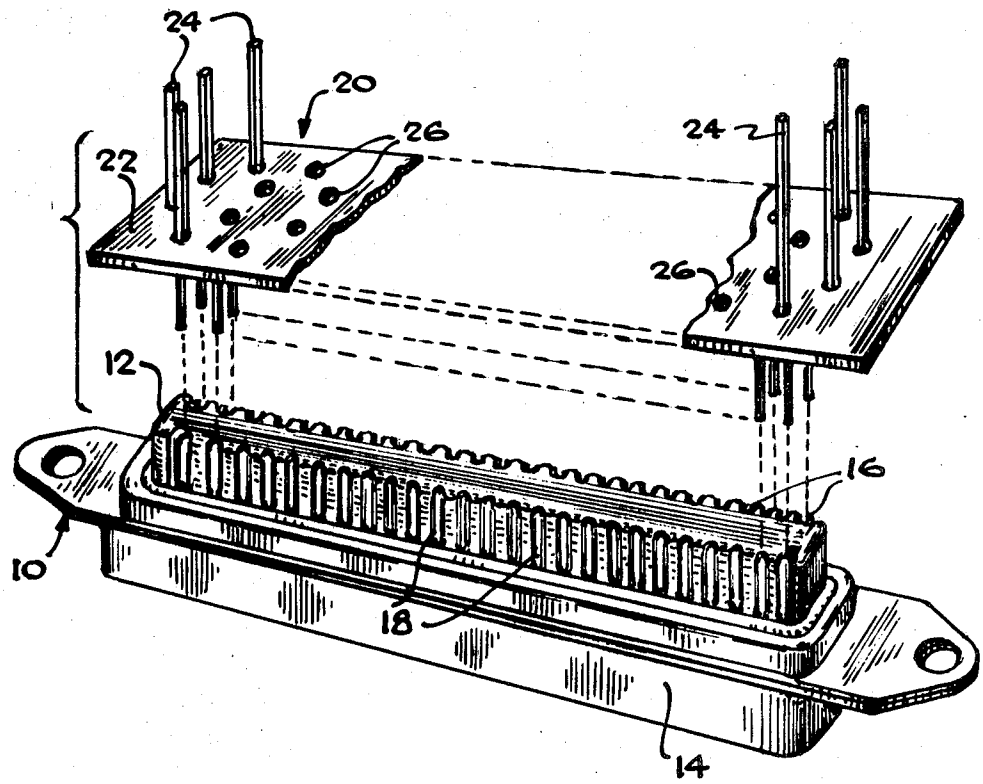


FIG. 1

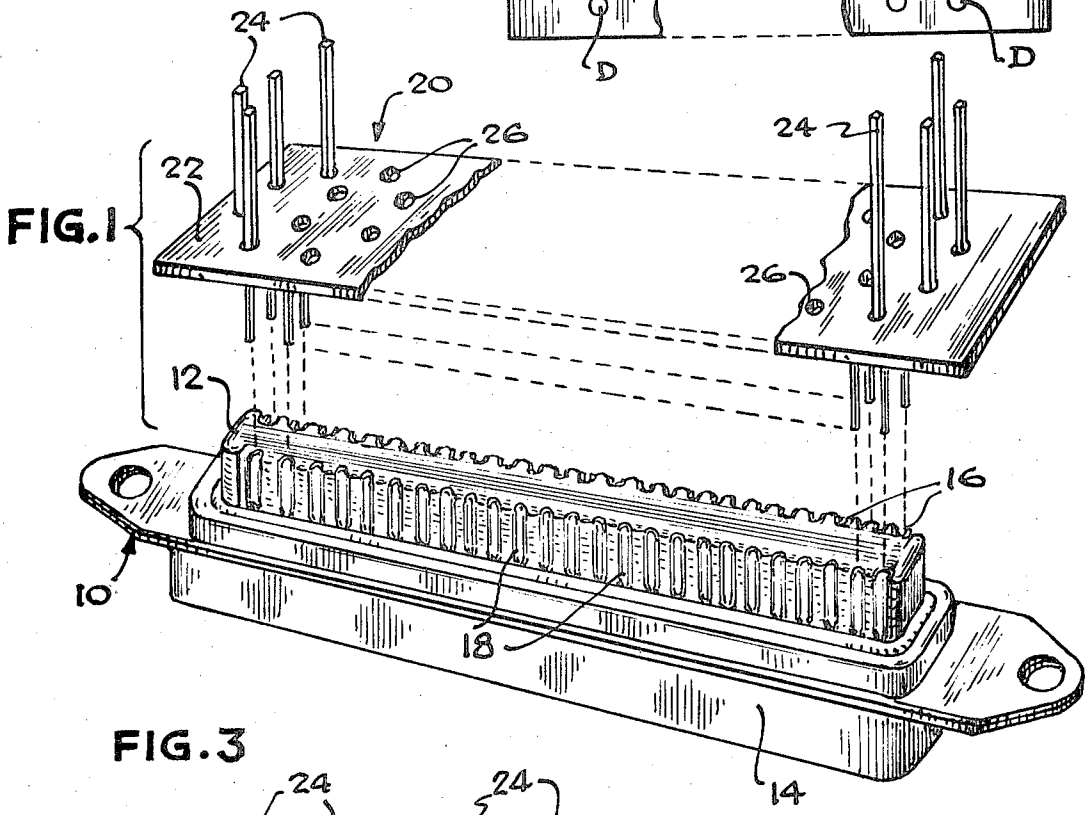


FIG. 2

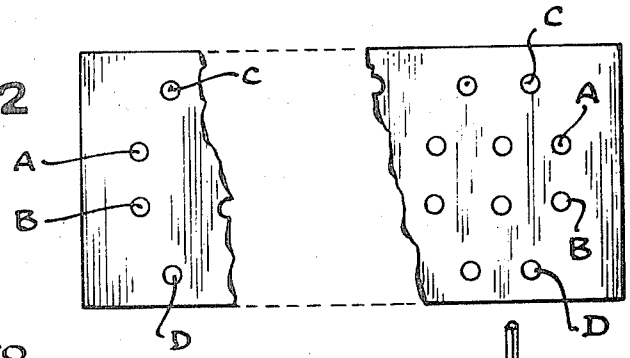


FIG. 3

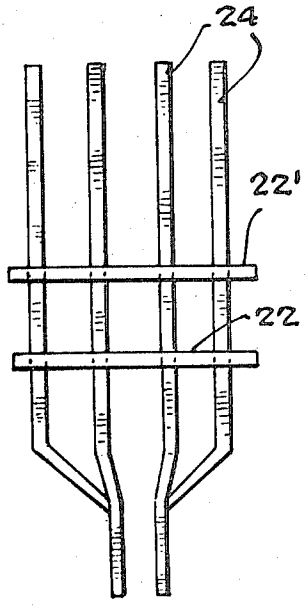


FIG. 4

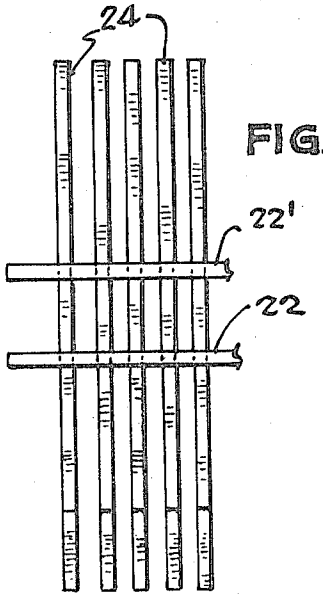
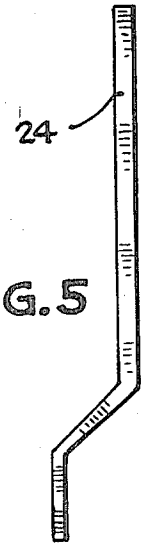


FIG. 5



ADAPTOR

DISCLOSURE

The present invention relates to an adaptor for use with high contact density connectors and more specifically it relates to an adaptor which will permit the use of conventional wire wrap equipment to connect leads to the contacts of an electrical connector.

It is generally recognized that the connector art is replete with elements and sub-elements of connector units and assemblies to define mechanical and electrical connection between various circuit elements. The art has, of course, developed with technological developments in the field of electronics and specifically with regard to provision of circuit elements in a variety of forms and configurations. One form commonly utilized in defining electrical circuits is the high contact density connector associated with ribbon like contact circuit means carried by support members of insulating material.

Electrical connectors of the type generally illustrated herein may be provided with any pre-determined number of contact terminals. The type specifically illustrated for purposes of disclosure of the inventive concept set forth herein contains a plurality of terminals being placed along either side of the insulating body of the connector in parallel, spaced-apart relation.

The electrical connectors of the type illustrated herein commonly are electrically joined to circuit elements by application of a wire to the mating terminals of the connector and soldering of the wire to the terminal to define a secure mechanical and electrical interconnection. It can readily be seen that wire application and soldering is difficult with the relatively high density of the contact terminals. Also, it is difficult to apply more than one wire to any single terminal.

The adaptor of the present invention is provided to define a means for eliminating wiring of the individual terminals and to provide for flexibility and use of the connector and the associated circuits. To this extent an adaptor is provided to define a means for modifying the wiring and soldering concept to adapt it for use with wire wrap techniques which, of course, facilitate assembly, repair and modification.

The particular electrical connector schematically illustrated herein and set forth for purposes of the present disclosure is designed with the terminal elements on 85 mil centers, for example, with the terminal elements being formed of electrically conductive material substantially 8 mils in thickness. With conventional techniques, wires are simply applied to the terminals and then soldered to secure them to the terminals. This means that, with the connector illustrated, wires must be soldered to the terminal elements of the contacts of the connector to define the mechanical and electrical inter-connection between circuits desired with the connector assembly set forth herein. This is a difficult and cumbersome operation and, moreover, does not provide for flexibility in use of the circuit.

The adaptor element defined herein avoids the need for individual wiring of the terminals and permits use of wire wrap techniques.

It is, accordingly, a general object of the present invention to provide an adaptor for use with high density contact element connectors to provide for use of wire wrap techniques in joining the contact terminals to the circuit elements.

Other objects reside in the provision of an adaptor means to improve and simplify repair of a circuit or modification of a circuit and to provide an adaptor component which is inexpensive to manufacture, repair and use and which is readily adapted for use with connector elements.

The novel features which are believed to be characteristic of the invention are set forth with particularity in the appended claims.

The invention itself, however, together with further objects and advantages thereof will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of the adaptor of the present invention illustrated in conjunction with a high contact density connector;

FIG. 2 is a fragmentary top plan view of the support means associated with the adaptor;

FIG. 3 is an end view of the adaptor assembly of FIG. 1 showing the support means and wire wrap posts, in combination;

FIG. 4 is a fragmentary side elevation of the adaptor of FIG. 1; and

FIG. 5 is an elevation of one wire wrap post of the type associated with the adaptor disclosed herein showing the forming of the adaptor post in the finished assembly.

Referring more particularly now to the drawings, a multi contact connector typical of the type with which the adaptor of the present invention may be employed is schematically illustrated at 10 in FIG. 1. The connector 10 is defined by an insulating body 12 disposed and secured within a protective shield or cover 14 which may be of formed aluminum, or other suitable material.

In the connector 10 specifically illustrated herein, the insulating body 12 is provided with a plurality of spaced apart recesses 16 along each side thereof, as illustrated. Terminal elements 18 are adapted to be received within the recesses 16. The terminal portions 18 extending within the insulating body, as shown, are generally defined in a U-shaped configuration, although any other suitable form or shape may be employed.

As noted above, the conventional technique for securing the connector 10 to related circuit elements is to apply an electrical lead to each of the terminals 18 and then solder the leads to the terminals to secure them with respect to the terminals 18. This, of course, would require a lead to be separately positioned on each of the terminals 18 and maintained in position with respect to the terminals until they are soldered to secure them.

The adaptor disclosed herein provieds a simple means to avoid wiring of the individual terminals by modifying the concept to adapt it for use with wire - wrap techniques which readily facilitate assembly of the related circuit elements to the connector 10 and permit much easier access for maintenance and repair, as required.

The adaptor is illustrated generally at 20 in FIG. 1 and is comprised of a support member 22 to which a plurality of wire wrap posts 24 are secured.

The support member 22 is provided with a plurality of spaced-apart openings 26 extending therethrough. Preferably, these openings are generally round although any other suitable opening configuration may

be employed. The support member **22** is electrically non-conductive so that the wire wrap posts **24** disposed therein are suitably insulated with respect to each other.

It should be noted that conventional wire - wrap techniques require the use of a wire wrap tool which has a terminal portion adapted to be telescopically received over the wire wrap post and to literally wrap a wire lead in a spiral about the post in a secure manner so that the wire may be captured on the post after removal of the tool. The wire wrap tool and techniques employed therewith are common in the art and form no part of the inventive concept disclosed herein. It should be noted also that the wire wrap tool has a physical dimension which requires that the wire wrap posts be spaced apart a distance which is sufficiently great to permit insertion of the wire wrap tool about the adjacent post without interference between posts.

As noted above, the connector **10,** is by way of example, provided with terminals **18** which are spaced on **85** mil centers. Application of straight wire wrap posts to the terminals **18** on the **85** mil centers would not provide sufficient clearance for the wire wrap tool to be telescopically received about the post terminals to wrap the wire leads thereabout. Accordingly, it is necessary to provide some means in the use of the adaptor which will permit conventional wire wrap techniques.

The adaptor of the present invention employs the staggered configuration which will provide the necessary spacing for use of the wire wrap tool. For example, the paired openings A – B are in relatively close-spaced relation while the paired openings C – D are spaced apart a greater distance than the pair A –B. The distance defined between the centers of the openings A – B – C – D may be 0.176 inches or 0.125 inches depending upon whether the wire wrap posts are 0.045 inches or 0.025 inches square, respectively. Staggering of the wire wrap posts in this manner will provide clearance for the wire wrap tool. It should be noted that any suitable dimensions may be selected in the manufacture of a connector of the type disclosed herein. This would, of course, require appropriate modification of the dimensional characteristics specifically noted here by way of example.

In assembly of the adaptor **20** the straight portions of the wire wrap posts are pressed into the insulative support member **22** and extend through the openings thereof. The wire wrap posts **24** generally are square to provide corners for frictional engagement between the wire leads wrapped thereabout and the post and thereby permit the leads to be captured by the slightly smaller diameter, generally round openings **26** in the insulating support member **22** thereby providing means for securing the posts **24** to the board **22** without additional means for locking the posts to the support member **22.**

As schematically illustrated in FIGS. **3** and **5,** the portion of each of the wire wrap posts **24** extending below the support member **22** (as viewed in FIGS. **1** and **3**) is formed inwardly toward the longitudinally defined center of the support member **22** to bring that portion of the post to a position where it will register the terminals **18** of the connector **10.** Accordingly, as viewed in FIGS. **3** and **5** of the drawings, the lower portions of the posts inserted in the opening A – B are bent slightly inward to move them in spaced apart relation in a pattern which will register with the spaced apart relation of the terminals **18** located on opposite sides of the insulating member **12.** The posts inserted in the openings C – D of the board **22** are formed inwardly a greater amount to bring the terminal insertion portions thereof into the same spaced apart relation as the posts inserted in the openings A – B.

The terminal insertion portions of the wire wrap posts **24** (below the support member **22** is viewed in FIGS. **1** and **3**) will be on **85** mil centers (e.g.) on each side of the array and therefore in aligned relation with the terminals **18** in planar array on each side of the insulating body **12.** However, the formed characteristic of the wire wrap posts will place the upper portion thereof (above the member **22**) on 0.176 or 0.125 centers (e.g.) as required depending upon the physical dimension of the posts **24** empolyed in the adaptor, as noted above.

In some instances it may be helpful to employ a second support member **22'** (FIG. **3**) to define a more rigid adaptor assembly and to prevent mis-alignment of the upper portion of the wire wrap posts **24.** The double support member assembly **22 – 22'** will, of course, define a more rigid structure and provide means for securely mounting the wire wrap posts **24.**

When the adaptor assembly **20** is applied to the connector **10** so that the lower portions of the wire wrap posts **24** are engaged with the terminals **18,** conventional wave soldering techniques may be employed to mechanically and electrically secure the lower elements of the wire wrap posts **24** to the terminals **18.**

The advantage of using the adaptor set forth herein over conventional wiring techniques is that the much faster and more flexible wire wrap techniques may be employed with the connector assembly. The wire wrap technique, of course, is also more flexible in that more than one lead may be secured to a wire wrap post to utilize different circuit functions, as required. It can readily be appreciated that it would be difficult to secure more than one wire to the terminal **18** to achieve the same circuit flexibility — although it is recognized that other circuit techniques may be employed with some difficulty. Also, if the circuit is modified in some manner it will not be necessary to unsolder a wire from the terminal **18** but, rather, it is necessary only to unwrap the wire from the post **24** associated with the modified circuit function. In addition to the above, if repair of the circuit is necessary it may readily be accomplished by unwrapping the wire from the post and making the appropriate repairs without having to unsolder and resolder a lead to the terminal **18.**

While a specific embodiment of the present invention has been shown and described it will, of course, be understood that other modifications and alternative constructions may be used without departing from the true spirit and scope of this invention. It is therefore intended by the appended claims to cover all such modifications and alternative constructions as fall within the true spirit and scope.

What we desire to secure by United States Letters Patent is:

1. An adaptor for a high density multi-contact connector to permit use of conventional wire wrap equipment in connecting leads to the connector, said connector having spaced-apart contacts on opposed sides thereof, the contacts on one side being in opposed relation to the contacts on the other side so as to provide pairs of opposed contacts, said adaptor comprising:

support means having pairs of openings in predetermined spaced relation extending longitudinally thereof, alternate pairs of openings being spaced apart a distance greater than its adjacent pair of openings, a plurality of wire wrap posts secured to the support and extending through the openings therein, said posts being secured to the support means by interengagement with the walls of the openings therein, the portion of said posts on one side of said support means being substantially straight, the portions of said posts on the other side being formed inwardly toward the longitudinally defined center of the support means, the pairs of posts having wider spacing being former inwardly at a greater angle than the pairs of posts of lesser spacing, said inwardly formedpost elements bring the said post portions into position wherein each pair registers with a pair of opposed contacts on the sides of said connector.

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