United States Patent [19]

Reimer

[11] **3,748,628**

[45] **July 24, 1973**

[54] **PRINTED WIRING CABLE TERMINATION**

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[73] Assignee: **GTE Automatic Electric Laboratories Incorporated**, Northlake, Ill.

[22] Filed: **June 15, 1972**

[21] Appl. No.: **263,344**

[52] **U.S. Cl.**..... **339/17 F**, 339/103 M, 339/176 MF

[51] **Int. Cl.** **H01r 13/58**, H05k 1/07

[58] **Field of Search**..... 339/17, 18, 75 MP, 339/95, 99, 176 MF, 176 MP, 59, 60, 61, 103, 105, 107

[56] **References Cited**

UNITED STATES PATENTS

3,079,579	2/1963	Crimmins et al.	339/17 F X
2,854,502	9/1958	Richter	339/17 F X
3,432,794	3/1969	Churla	339/17 F
3,369,214	2/1968	Krumreich et al.	

FOREIGN PATENTS OR APPLICATIONS

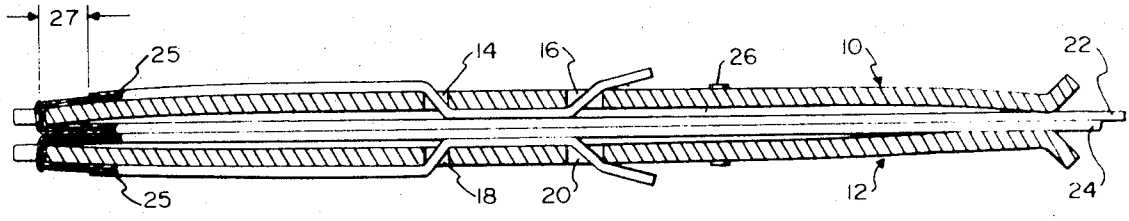
700,490	12/1953	Great Britain	339/17 F

Primary Examiner—Marvin A. Champion
Assistant Examiner—Terrell P. Lewis
Attorney—K. Mullerheim, Robert F. Van Epps et al.

[57] **ABSTRACT**

There is herein disclosed a termination card for printed wiring cables wherein the cables are routed through apertures in a pair of cards which are fastened together to provide both cable clamping and strain relief. Electrical coupling is provided by the cables themselves without any electrical connection to the termination card.

5 Claims, 2 Drawing Figures



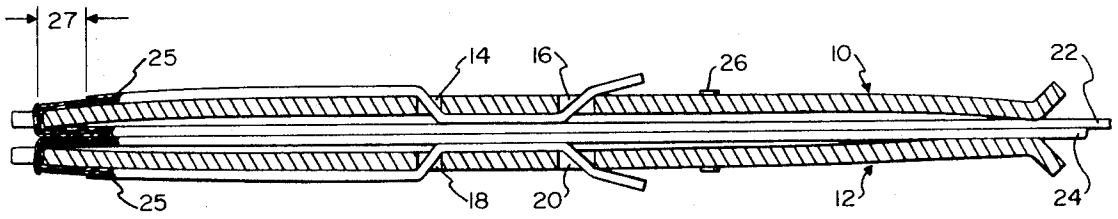

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FIG. 1

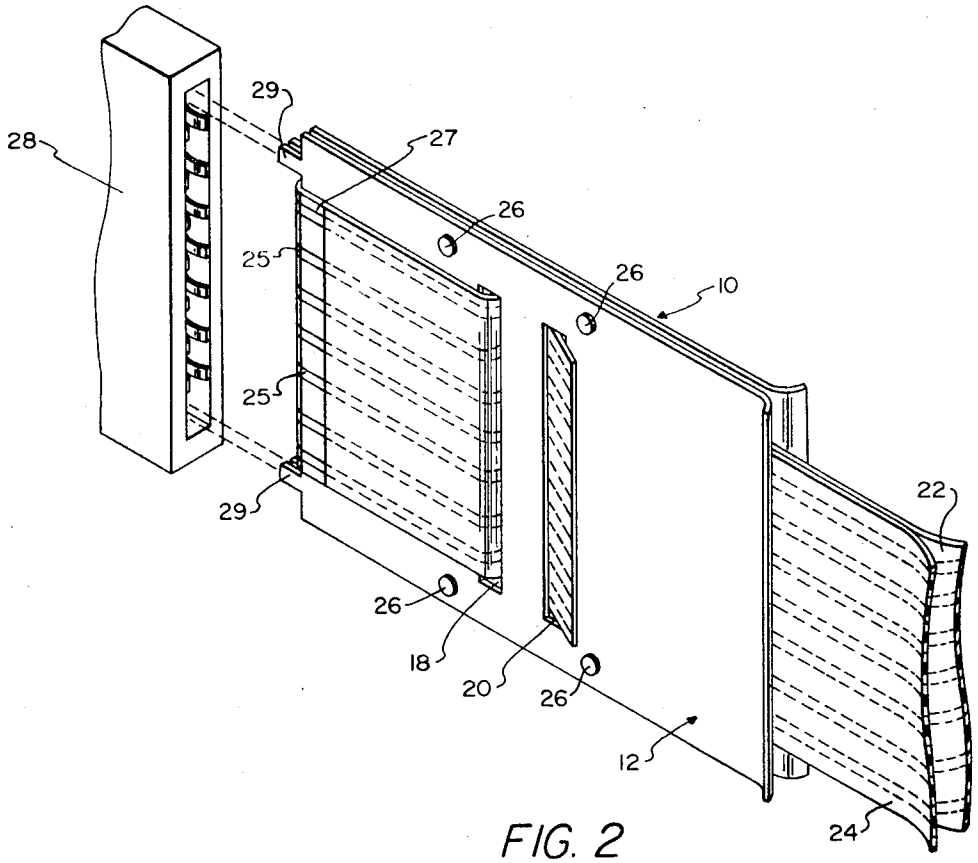

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FIG. 2

PRINTED WIRING CABLE TERMINATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to electrical cable termination devices and more particularly to a new and improved printed wiring cable termination card.

2. Description of the Prior Art

In most modern electronic systems it becomes necessary to interconnect a plurality of printed wiring card files. The interconnection technique most usually employed is to provide each file with plug-in printed wiring cards to which a cable, either of the conventional or printed type, is electrically terminated. These wiring cards thus become essentially a double sided connector plug. Illustrative of the prior art is a termination strip for electric cable described in U.S. Pat. No. 2,854,502 which issued to H. W. Richter on Sept. 30, 1958.

The difficulties encountered with the prior art cable termination strips are basically twofold. First it is necessary that each conductor of the wiring cable be individually connected to a corresponding electrical terminal on the termination strip. The requirement for printing of electrical terminals on the termination strip and the electrical connection requirement both add to the production time and expense. Secondly, in order to minimize cable wear it is generally necessary to provide additional cable clamping means such that the cable is not worked against the edges of the termination strip.

OBJECTS AND SUMMARY OF THE INVENTION

From the preceding description it will be understood that among the various objectives of the present invention are included the following:

the provision of a new and improved printed wiring cable termination card;

the provision of a device of the above-described character which is electrically inert;

the provision of a device of the above-described character having improved cable strain relief characteristics.

These and other objectives of the present invention are efficiently achieved by providing first and second substantially identical thin metal cards each having first and second parallel slots disposed transversely therein. A printed wiring cable is passed around the end of each card and routed back through the slots. The cards are then fastened together clamping the cables therebetween. To provide electrical coupling the insulation is removed from a portion of each printed cable proximate the end of the termination card around which each is passed.

The foregoing as well as other objects, features and advantages of the present invention will become more apparent from the following detailed description taken in conjunction with the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an edge view of a printed wiring cable termination constructed according to the principles of the present invention; and

FIG. 2 is an elevation view of the apparatus of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to FIG. 1 there are shown first and second cable termination cards **10** and **12**, each having first and second parallel slots **14** and **16** and **18** and **20** respectively disposed transversely therein. The termination cards **10** and **12** may conveniently be stamped from thin aluminum stock. A first printed wiring cable **22** is passed adjacent the inside surface of the first card **10**, around the end thereof, back and inwardly through slot **14** and out through slot **16**. In like fashion a second printed wiring cable **24** is passed adjacent the inside surface of the second termination card **12**, around the end thereof, back and inwardly through slot **16** and out through slot **18**.

Once the cables **22** and **24** are routed around and through the termination cards **10** and **12** respectively the cards are fastened securely together by any convenient means. Rivets **26** are illustrated, however, in applications where cable changes are anticipated, a threaded fastening means would be more desirable. The double cable thickness at the center of the assembly establishes a cable clamping zone along the axis of the cable such that the cable is not worked against any edge which would tend to wear through the insulation or conductors. Despite the double cable thickness at the center the terminated cable is a predetermined thickness at the edge of the cards around which the cables are routed such that it will properly engage a conventional printed wiring card connector. In order to effect the electrical connections to the cable conductors **25** a portion of the insulation is removed from each cable over a connector contact zone **27** at the end of the terminated cable. The necessity for separately terminating the conductors of each cable **22** and **24** to printed terminals on a printed wiring card is completely eliminated.

The edge view of FIG. 1 shows the embodiment of the present invention for terminating printed cable with insulation on both surfaces. It will be understood, however, that should it be desired to terminate printed cable which is insulated only on one surface the principles set forth above apply equally well with the addition of insulative material between the cables **22** and **24** and between each cable and the termination cards **10** and **12**.

FIG. 2 is an elevation view of the terminated printed wiring cable described with reference to FIG. 1 and wherein like reference numerals are used to identify like elements. This view illustrates the manner in which the cables **22** and **24** are routed around the ends of the termination cards **10** and **12** which are provided with locating tabs **26** which serve to accurately position the cables for insertion in a conventional printed wiring card connector **28**. It is further preferred that the edge of the cable termination cards opposite the connector **28** be flared outwardly to minimize cable wear by working against the edge and also to provide a surface which may more easily be grasped during insertion and removal of the cable from the connector **28**.

From the foregoing description it will be seen that the Applicant has provided a new and novel termination for printed wiring cable wherein the objectives set forth hereinabove are efficiently achieved. Since certain changes in the above-described construction will occur to those skilled in the art without departure from the

scope of the invention it is intended that all matter set forth in the description or shown in the appended drawings shall be interpreted as illustrative and not in a limiting sense.

Having described what is new and novel and desired to secure by Letters Patent, what is claimed is:

1. A printed wiring cable termination comprising

first and second rectangular termination cards each having first and second substantially parallel spaced slots disposed therethrough,

a flexible printed wiring cable disposed between said first and second termination cards, around one end of one of said first termination card, passing inwardly through a first of said transverse slots in said first termination card proximate the end about which said cable is disposed, passing between itself and said first termination card, and outwardly through the second of said transverse slots in said first termination card,

said printed wiring cable having at least a portion of each of the conductors thereof adjacent the end of said first termination card exposed, and

means for securing said termination cards together such as to clamp said cable therebetween in the space between said first and second transverse slots.

2. A printed wiring cable termination as recited in claim 1 further including

a second flexible printed wiring cable disposed between said first and second termination cards, around one end of said second termination card, passing inwardly through a first of said transverse slots in said second termination card proximate the end about which said second cable is disposed, passing between itself and said second termination card, and outwardly through the second of said transverse slots in said second termination card, and

said second printed wiring cable having at least a portion of each of the conductors thereof adjacent the end of said second termination card exposed.

3. A printed wiring cable termination as recited in claim 1 further including

each of said first and second termination cards having the edge thereof opposite that around whih said wiring cable is disposed outwardly flared away from said wiring cable.

4. A printed wiring cable termination as recited in claim 1 further including

each of said first and second termination cards having first and second longitudinally extending cable locating tabs formed in the edge thereof around which said wiring cable passes.

5. A printed wiring cable termination as recited in claim 2 wherein

said first and second termination cards are formed from a metallic stock, and further including

a layer of electrically insulating material disposed between each of said termination cards and said printed wiring cable, and a layer of electrically insulating material disposed between said printed wiring cables.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,748,628 Dated July 24, 1973

Inventor(s) Wm. A. Reimer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 13, after "end" delete -- of one --

Signed and sealed this 27th day of November 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents

H-1467

August 20, 1973

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.