

[54] **ELECTRICAL CONNECTING DEVICE FOR INSULATED WIRES**

[75] Inventor: **Grey Manning Gurley**, Seminole, Fla.

[73] Assignee: **AMP Incorporated**, Harrisburg, Pa.

[22] Filed: **July 16, 1971**

[21] Appl. No.: **163,200**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 807,300, March 14, 1969, Pat. No. 3,593,403.

[52] U.S. Cl. **339/36, 339/97 P**

[51] Int. Cl. **H01r 13/44, H01r 9/08**

[58] Field of Search **339/36, 95-99, 339/205; 174/88 R, 88 S, 95, 97**

[56] **References Cited**

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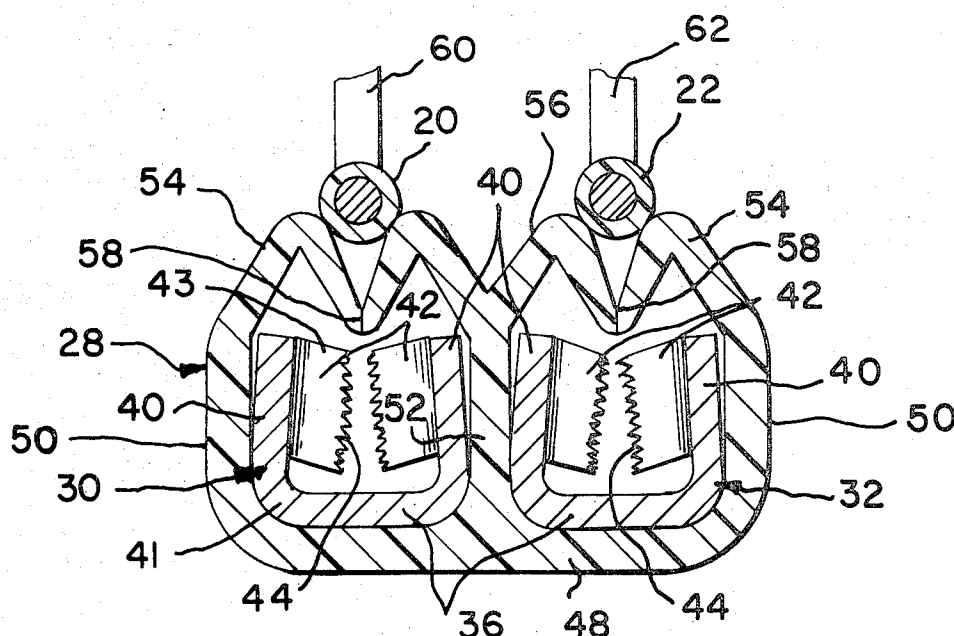
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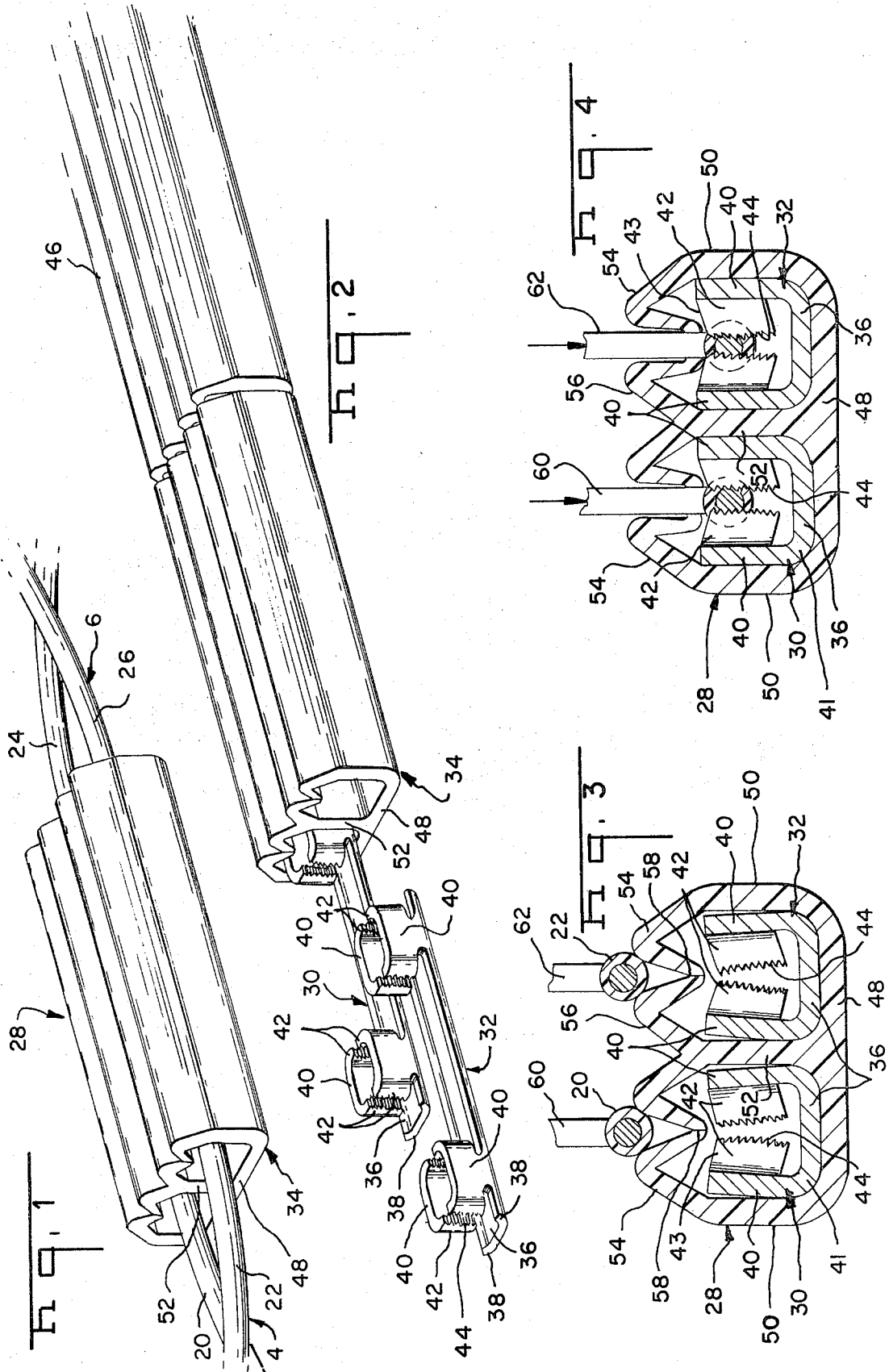
Primary Examiner—Joseph H. McGlynn
Attorney—William J. Keating, Gerald K. Kita, John R. Flanagan and Alan B. Osborne

[57] **ABSTRACT**

Insulated electrical connector comprises a metallic connecting device having opposed U-shaped sections integral with each other. The opposed edges of the U-shaped sections comprise wire receiving slots. The metallic connecting device is contained in a plastic housing open at one end and having an axial slit in alignment with the slots. An electrical and mechanical connection to a wire is made by passing the wire laterally of its axis through the slit and inserting the wire into the slots.

5 Claims, 4 Drawing Figures





ELECTRICAL CONNECTING DEVICE FOR INSULATED WIRES

This application is a Continuation In Part of application Ser. No. 807,300 filed Mar. 14, 1969 and issued July 20, 1971 as U. S. Pat. No. 3,593,403. U. S. Pat. No. 3,593,403 is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

A commonly used type of electrical connective device comprises a metallic member having a wire receiving slot into which the wire is pushed when the connecting device is connected to the wire. Some of these slot-type connecting devices are adapted to penetrate wire insulation so that it is unnecessary to strip the insulation from the wire end prior to forming the electrical connection.

In accordance with one aspect of the instant invention, there is provided an improved slot-type electrical connecting device which can be manufactured in small sizes and which additionally is extremely small in size with relation to the size of the wire to which the electrical connection is being made. Connecting devices of the preferred type as described in U.S. Pat. No. 3,593,403 can be used under a variety of circumstances, the disclosed embodiment of the invention being in the form of a device for electrically connecting two wires which extend axially towards each other and/or two pairs of wires which extend towards each other.

In accordance with a further aspect of the invention, I provide a one-piece insulating housing for slot-type connectors in the form of a tubular plastic member which is open at one end and which has a slit extending inwardly from the open end, the slit being in alignment with the slots in connecting device. The physical properties of the insulating housing are such that when a wire is passed therethrough, the portions of the housing adjacent to the slit will be opened to admit the wire but will return to their normal positions after the wiring has been inserted into the slots of the connecting device so that the completed connection is entirely surrounded by insulated plastic material.

It is thus an object of the invention to provide an improved connecting device. A further object is to provide an improved insulated electrical connecting device. A further object is to provide an insulated connecting device which is small in size relative to the size of the wires to which connections are made. A further object is to provide an improved connector for connecting the wires of two pairs of wires to each other in two separate electrical connections.

These and other objects of the invention are achieved in preferred embodiments thereof which are briefly described in the foregoing abstract, and which are described in detail in the specification which follows and in the specification of U.S. Pat. No. 3,593,403 and which are shown in the accompanying drawing.

FIG. 1 is a perspective view of a completed connection between two pairs of wires 4, 6.

FIG. 2 is a perspective view of an extrusion 46 from which the housing 28 is formed and showing metallic connecting devices 30, 32 in accordance with the invention which are contained in the housing.

FIG. 3 is a transverse sectional view of a connecting

device in accordance with the invention illustrating the manner in which wires are aligned with the connecting devices in the housing prior to insertion.

FIG. 4 is a view similar to FIG. 3 but showing the positions of the parts after completion of the inserting operation.

A metallic connecting device 30 or 32 and the insulating housings 34 for such connecting devices are fully described at column 2, line 57 et seq. of U.S. Pat. No. 3,593,403. In the claims which follow, the complete assembly, comprising the metallic parts 30 or 32 and the housing 34, is recited as an insulated connector. A metallic part, 30 or 32, is recited as a connecting device. It should also be noted that the ears 40 are set forth as U-shaped members having a bight, sides, and opposed edges which are spaced apart to define wire-receiving slots.

I claim:

1. A stamped and formed connecting device for forming electrical and mechanical connections with a wire comprising:

a substantially flat web having spaced-apart side edges, a pair of U-shaped members, each of said members having a bight and sides, said U-shaped members being in opposed facing relationship on one side of said web with said bight of each of said members being integral with one of said side edges of said web and with the axes of said U-shaped members extending substantially normally of said web, the corresponding edges of said sides of said U-shaped members being opposed and spaced apart by a distance which is less than the diameter of said wire, said corresponding edges constituting the edges of aligned wire-receiving slots whereby, upon positioning said wire with its axis extending in alignment with said wire-receiving slots and upon movement of said wire laterally of its axis towards said web and into said slots, said wire is electrically and mechanically connected to said connecting device.

2. A connecting device as set forth in claim 1 wherein said opposed edges of said U-shaped members have serrations.

3. A connecting device as set forth in claim 2 wherein said serrations on each of said edges comprise a plurality of teeth, each of said teeth having one side extending away from its respective edge and sloping towards said web, and each tooth having another side which extends substantially perpendicularly of its respective edge.

4. A connecting device as set forth in claim 3 including a tubular housing of polymeric insulating material completely surrounding said connecting device, said housing being open at one end thereof and having an axial slit on one side, said slit being in alignment with said aligned slots to permit passage of said wire into said housing and into said slots.

5. A connecting device as set forth in claim 3 including a second pair of U-shaped members on said web which are spaced from, said pair of U-shaped members, said connecting device being adapted to connect two wires which extend axially towards each other.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : B1 3,760,331
DATED : June 2, 1987
INVENTOR(S) : Grey M. Gurley

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

Claim 6, line 14, after "edges" add --of said sides of said U-shaped members being opposed and spaced apart a distance which is less than the diameter of said wire, said corresponding edges--.

**Signed and Sealed this
Fifth Day of April, 1988**

Attest:

Attesting Officer

DONALD J. QUIGG

Commissioner of Patents and Trademarks

REEXAMINATION CERTIFICATE (696th)
United States Patent [19] [11] **B1 3,760,331**
Gurley [45] **Certificate Issued** **Jun. 2, 1987**

[54] **ELECTRICAL CONNECTING DEVICE FOR INSULATED WIRES**

[75] **Inventor:** Grey M. Gurley, Seminole, Fla.

[73] **Assignee:** AMP Incorporated, Harrisburg, Pa.

Reexamination Request:
No. 90/000,766, Apr. 26, 1985

Reexamination Certificate for:

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Issued: Sep. 18, 1973
Appl. No.: 163,200
Filed: Jul. 16, 1971

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 807,300, Mar. 14, 1969, Pat. No. 3,593,403.

[51] **Int. Cl.⁴** **H01R 4/24**

[52] **U.S. Cl.** **339/36; 339/97 P**

[58] **Field of Search** 339/36, 95-99, 339/205; 174/88 R, 88 S, 95, 97

[56] **References Cited**

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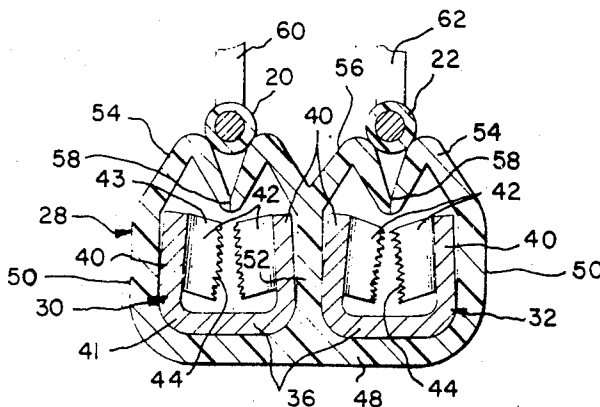
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Primary Examiner—Joseph H. McGlynn

[57] **ABSTRACT**

Insulated electrical connector comprises a metallic connecting device having opposed U-shaped sections integral with each other. The opposed edges of the U-shaped sections comprise wire receiving slots. The metallic connecting device is contained in a plastic housing open at one end and having an axial slit in alignment with the slots. An electrical and mechanical connection to a wire is made by passing the wire laterally of its axis through the slit and inserting the wire into the slots.



REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS
INDICATED BELOW.

Matter enclosed in heavy brackets **[]** appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS
BEEN DETERMINED THAT:

The patentability of claims 1-5 is confirmed.

New claims 6 and 7 are added and determined to be patentable.

6. A stamped and formed connecting device for forming electrical and mechanical connections with a wire comprising:

a substantially flat web having spaced-apart side edges, a pair of U-shaped members, each of said members having a bight and sides, said U-shaped members being in opposed facing relationship on one side of said web with each of said members being integral with one of said side edges of said web only at said bight, and with the axes of said U-shaped members extending substantially normally of said web, the corresponding edges of said sides of said U-shaped members being opposed and spaced apart a distance which is less than the diameter of said wire, said corresponding edges constituting the edges of aligned wire-receiving slots whereby,

upon positioning said wire with its axis extending in alignment with said wire-receiving slots and upon movement of said wire laterally of its axis towards said web and into said slots, said U-shaped members are resiliently deflected and said wire is electrically and mechanically connected to said connecting device.

7. The connecting device as defined in claim 6 wherein said U-shaped members are of substantially the same thickness as said web.

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