

[54] **CRIMPING DEVICE**

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[51] Int. Cl. **B21d 9/08**

[58] Field of Search. 72/402, 410, 399;
29/203 D

[56]

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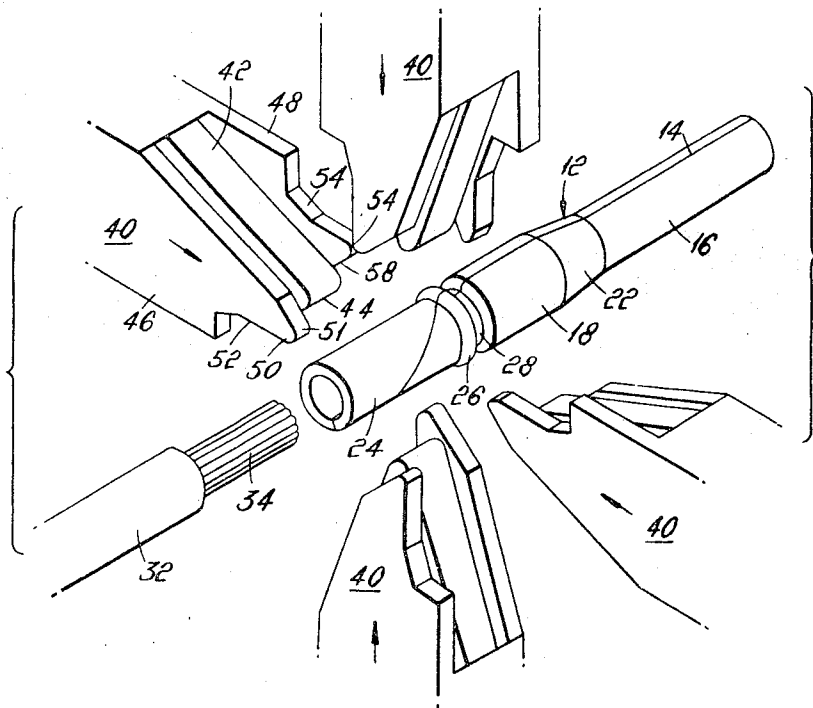
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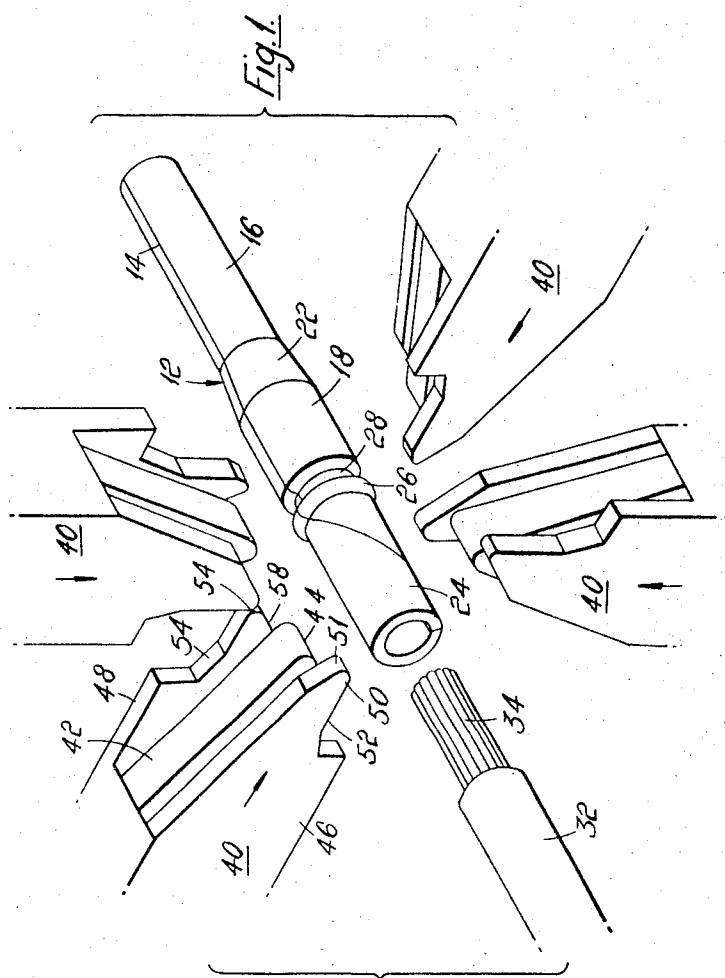
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ABSTRACT

Crimping indentors are provided to secure a wire to a roll formed contact having a terminal portion with a spiral seam therealong. Each crimping indentor is formed with a crimping end portion and a pair of positioning members.

3 Claims, 8 Drawing Figures





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Fig. 2

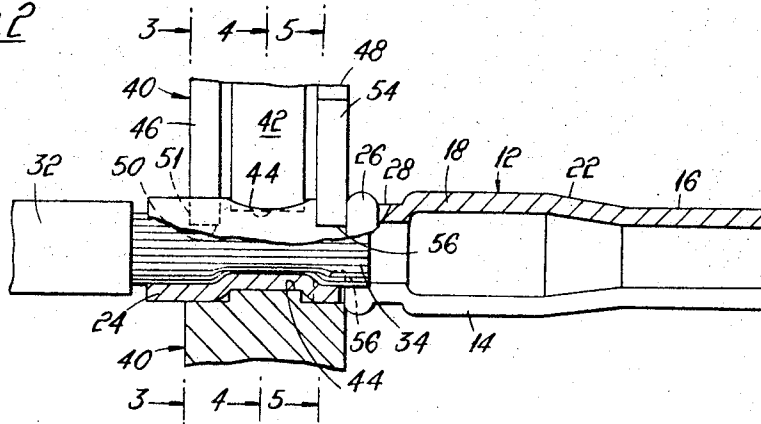


Fig. 3.

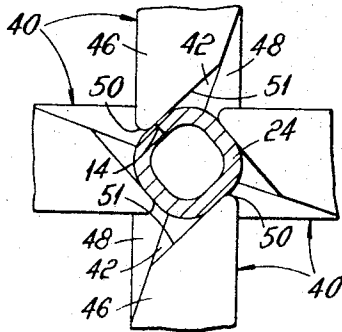


Fig. 4.

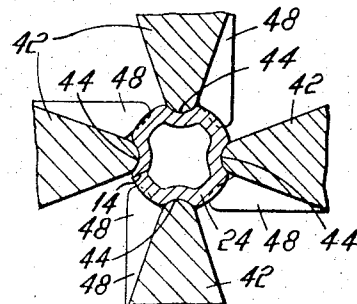
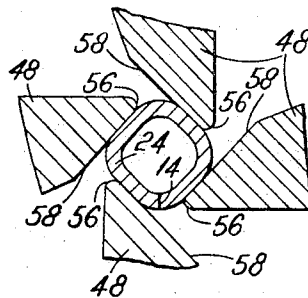


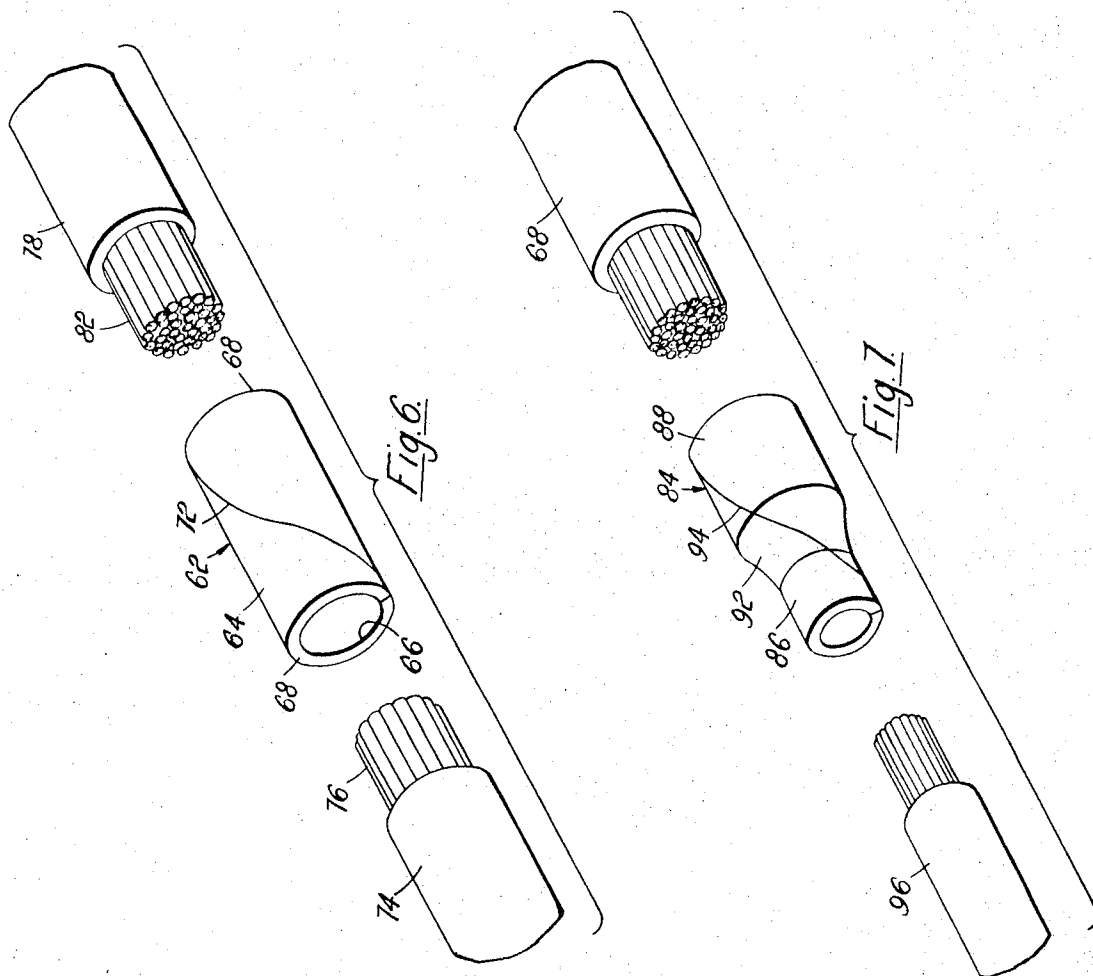
Fig. 5.



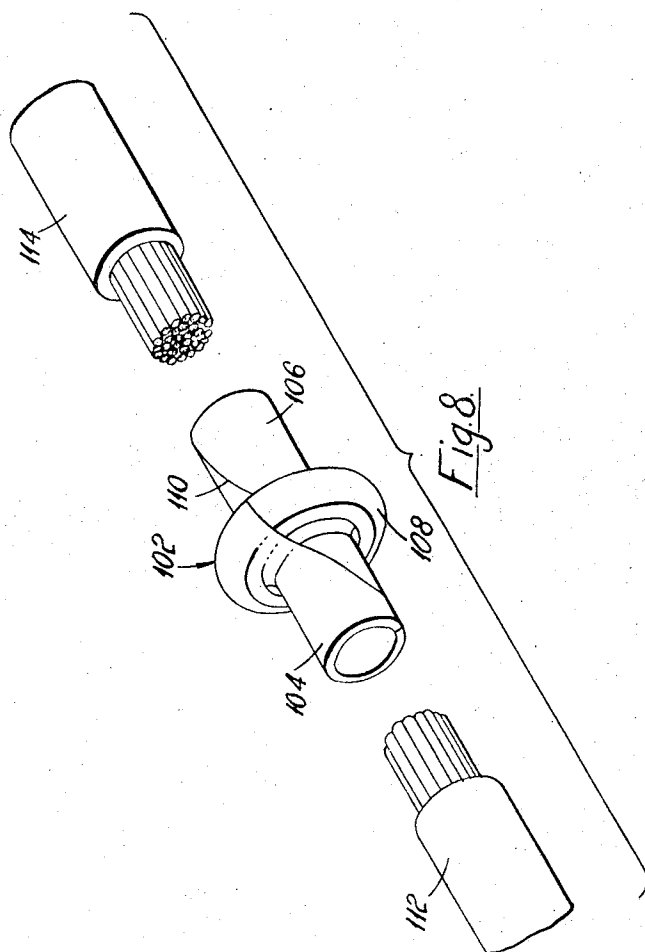
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CRIMPING DEVICE

This application is a division of copending application, Ser. No. 845,835 filed on July 29, 1969, for "Roll Formed Contact and Crimping Device Therefor, now U.S. Pat. No. 3,626,363."

The invention relates in general to crimp roll formed contacts and a crimping device therefor, and more particularly, to a contact having a split seam along the crimp barrel for confining a wire within a crimp termination.

BACKGROUND OF THE INVENTION

In conventional crimped contacts, a roll formed contact utilizing a straight split seam is fused together by means of soldering or welding or some other method to provide a solid crimp barrel. Thus, growth of splaying of the seam edges when crimping the bared wire of a conductor to the contact is prevented. Such an operation normally utilizes flat faced indentors in a conventional crimp tool. Before the crimping operation has commenced, however, the additional step of fusing the seam of the roll formed contact must be performed on the contact. Further, during the crimping operation, unless the fusing operation has been correctly performed, the chance of breaking or fracturing the seam is greatly increased thus causing an unreliable joint between the conductor and the crimp barrel of the contact.

In order to overcome the attendant disadvantages of prior art roll formed contacts, the present invention eliminates the need for fusing roll formed crimp contacts. The configuration of the seam along the crimp barrel is such that during the crimping operation, the seam in the roll formed crimp barrel of the contact tends to close rather than splay outwardly, thus confining the material in the crimp termination. Further, the crimping indentors utilized in the crimping tool may be readily installed in a conventional crimping tool thus eliminating the necessity of providing a new crimping tool. Moreover, orientation of the seam with respect to the crimping indentors is not required.

The advantages of this invention, both as to its construction and mode of operation will be readily appreciated as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like referenced numerals designate like parts throughout the figures. BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a perspective view of the novel roll formed contact and crimping indentors for crimping a wire to the contact;

FIG. 2 illustrates an axial view, partly in section, of the contact of FIG. 1, with the indentors abutting the contact;

FIG. 3 is a sectional side view of the contact and indentors of FIG. 2 taken along the lines 3—3 of FIG. 2;

FIG. 4 is a sectional side view of the contact and indentors of FIG. 2 taken along the lines 4—4 of FIG. 2;

FIG. 5 is a sectional side view of the contact and indentors of FIG. 2 taken along the lines 5—5 of FIG. 2;

FIG. 6 depicts an alternative embodiment of the contact of FIG. 1;

FIG. 7 shows a still further embodiment of the contact; and

FIG. 8 illustrates another embodiment of the contact.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown a roll formed contact 12 which is manufactured by stamping the contact material and then roll forming it with the resultant seam 14 present in the contact. The contact is formed of a front socket portion 16 for mating with a conventional pin contact (not shown). The contact further contains an enlarged central section 18 which is joined to the socket portion 16 by means of a tapered transitional section 22. The contact further contains a rear cylindrical terminal portion 24 which is joined to a flange section 26 at the front end thereof. Interconnecting the central portions 18 and the flange 26 is a short section of reduced diameter connecting section 28. The seam 14 extends along the axis of the contact from the front end of the socket portion 16 to the rear end of the flange section 26. In the terminal portion 24 of the contact, however, the seam is spiral shaped at a predetermined angle.

In conventional socket contacts, the contact seam is normally straight along the entire axis of the contact and is fused together by means of soldering, welding or other conventional methods of providing a solid contact member. Thus, when the wires of a conductor are inserted into the terminal portion of the contact, the terminal portion forms a solid crimp barrel which prevents growth or splaying of the seam edges when crimping in conductors using flat-face indentors in conventional crimping tools.

In the embodiment of FIG. 1, however, the seam 14 is not fused together and a conductor 32 having exposed wires 34 is inserted into the crimp barrel 24 in preparation for the crimping operation. Alternatively, the conductive wires could be made of a solid conductor. The crimping operation is performed by a plurality of identical indentors 40. The indentors 40 can be installed in a conventional crimp tool. Each of the indentors comprises a central substantially triangular section 42 whose front end narrows to the apex of the triangle 44. The front end 44 normally is curved rather than terminating in a sharp point. Mounted on either side of the triangular section 42 are a first positioning section 46 and a second positioning section 48. The positioning section 46 contains a somewhat triangular tip 50 which extends slightly beyond the tip 44 of the section 42 and contains a contact positioning portion 51 adjacent the tip 50 on one end surface, and a jaw portion 52 on the other end surface which provides clearance between adjacent indentors during the crimping operation. The positioning section 48 is identical to the section 46 but secured to the triangular portion 42 in a mirrored image position relative to the section 46 so that a jaw portion 54 of the member 48 faces in opposite direction as the jaw portion 52, and a triangular tip portion 56 adjacent the contacting positioning portion 58 of the section 48 faces slightly upwardly, whereas the tip portion 50 of the section 46 faces slightly downwardly.

After the wires 34 have been inserted into the terminal portion 24, the crimping tool is contracted so that the tips 44 of each indenter comes into contact with the outer surface of the terminal portion 24 as shown in FIG. 2, thus, securing the termination portion 24 to the wires 34. Without the contact positioning portions 51 and 58 of the indenter and a non-fused seam in

the terminal portion 24, the terminal portion 24 would splay along the seam edge. However, the portions 51 and 58 of each of the indentors tend to close the contact as can be seen in FIGS. 3 and 5. Thus, the contact may be crimped without fusing of the contact and growth or splaying of the seam edges does not occur.

With four indentors utilized, as shown, a seam of approximately 140° spiral, has been found to be sufficient so that orientation of the seam is not required with respect to the indentors. It should be understood, of course, that more or less than four indentors could be utilized without determining the orientation of the seam while simultaneously decreasing or increasing the seam spiral angle, respectively.

Further, while the contact has been depicted as a socket contact, it should be understood that the invention is applicable to pin contacts as well.

Moreover, while a spiral seam has been depicted in the terminal portion 24, it should be understood that any angular designed seam could be utilized along the terminal portion.

Referring now to FIG. 6, there is shown an alternative embodiment of the invention wherein a contact is formed of a cylindrical sleeve 62 having an outer surface 64 and an inner surface 66, and end walls 68. The sleeve further contains a spiral seam 72, a first conductor 74 having exposed wires 76, and a second conductor 78 having exposed wires 82, which may be inserted into the open ends of the sleeve 62 and crimped thereto by means of the crimping indenter depicted in FIG. 1. The sleeve 62 thus forms a simple effective wire splice.

Referring now to FIG. 7, there is shown a further alternative embodiment of the invention wherein a cylindrical sleeve 84 contains a reduced diameter rear portion 86 and an enlarged diameter front portion 88 which are interjoined by a tapered transitional portion 92. The sleeve further contains a seam 94. Thus, the sleeve of FIG. 7 can be used to join a conductor 96 having a small diameter to a conductor 98 having a large diameter.

In FIG. 8, there is shown a still further embodiment of the invention, wherein a sleeve 102 contains a front cylindrical portion 104 and a rear cylindrical portion 106, which are interjoined by a shoulder 108, and contains a seam 110. Moreover, it should be understood, of course, that in the embodiment of FIG. 8, the portions 104 and 106 could be of different diameters, dependent upon the diameters of the conductors 112, 114.

It should be further understood that the embodiments of FIGS. 6, 7 and 8 could be used as a splice to connect two wire conductors, or alternatively, could be used to join a wire conductor to a terminal lug.

We claim:

1. For a crimping tool, the combination comprising: a plurality of crimping indentors extending toward each other in a generally common plane; each said indenter including a central section and a pair of positioning sections; said central section of each indenter terminating in a crimping end portion for securing a seamed terminal member to a wire conductor; said pair of positioning sections of each indenter being fixed relative to each other and mounted on opposite sides of said central section in parallel relationship; and said positioning sections of each indenter having tip portions formed with oppositely facing contact positioning surfaces for preventing a seam of a terminal member from splaying along the seam edge during a crimping process.
2. The combination of claim 1 wherein: said tip portions of each indenter are of generally triangular configuration and are inclined in opposite directions relative to the crimping end portion of said central section.
3. The combination of claim 1 wherein: said positioning section of each said indenter extends beyond the crimping end portion of said central section.

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