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S. TONCHEN

3,332,272

INDENTER TOOL FOR TUBING

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FIG. 1

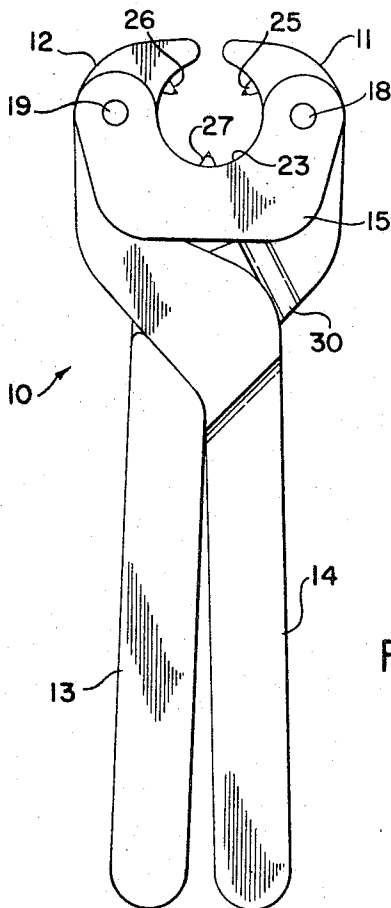


FIG. 2

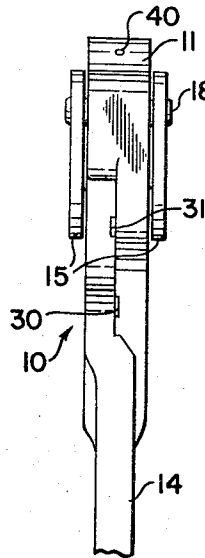


FIG. 3

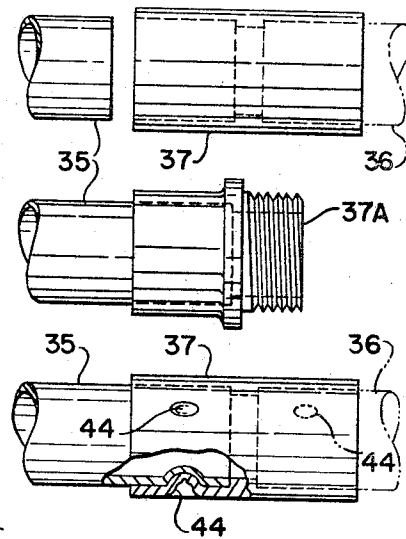


FIG. 4

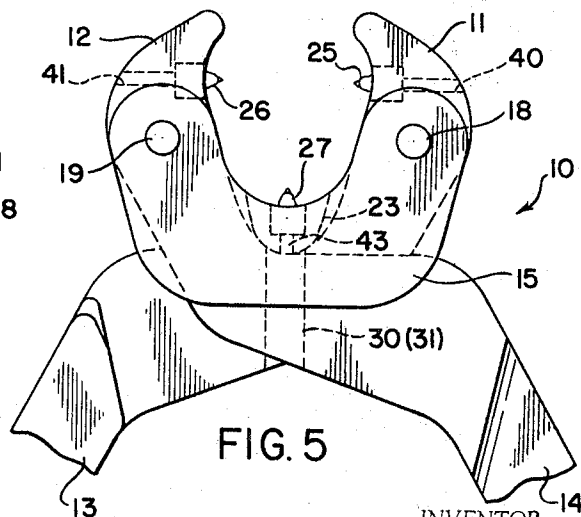
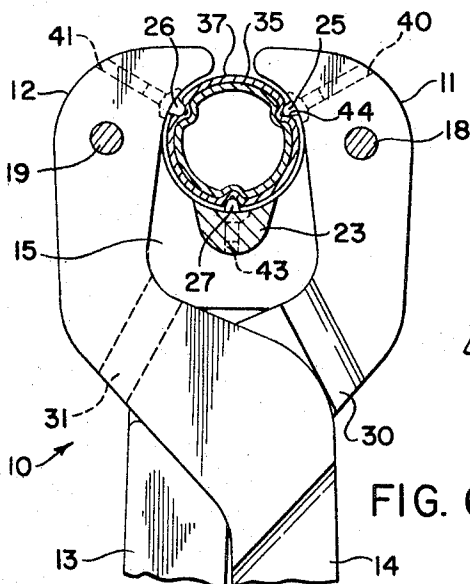
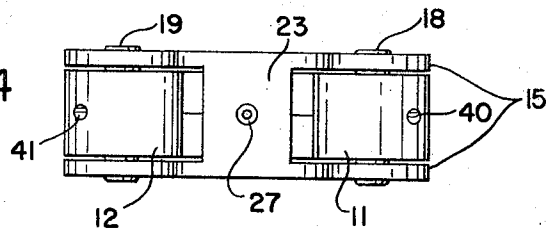


FIG. 5

INVENTOR.
STEPHEN TONCHEN

BY *Thomas S. Mayner*

ATTORNEY

1

3,332,272

INDENTER TOOL FOR TUBING

Stephen Tonchen, Kewanee, Ill., assignor to Midland-Ross Corporation, Cleveland, Ohio, a corporation of Ohio

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6 Claims. (Cl. 72—410)

This invention relates to a tool whose particular application is in the electrical circuit installation industry. More particularly, the invention relates to a plier-like manually actuated indenter tool adapted by an indentation of one cylindrical conduit while over another to therethrough provide for a firm connection.

Tubular metallic sections are generally used as conduits for electrical wiring and, where lengthy installations are made, these are joined by a union or sleeve-like connector and/or coupling, or by the insertion of one end of a conduit into an enlarged end of another section. The tubing sections are secured to each other by desirably, quickly and simply crimping the section connectors or unions. This is readily effected by a plier-like tool having within its jaws inwardly protruding pins or lugs which, upon a closure of the tool, travel radially inwardly into the connector surface tightly locking the connections through their indentation. The present invention is an improvement over existing similar tools in that it provides pliers having means to impress a connection at at least three points substantially equally spaced and generally radially operational. The three points of indentation in a single manual operation securely tie the connector union or sleeve to a conduit with a single handling of a single indenting operation.

Ordinarily, where less than three equispaced indenters are utilized the operator has to swing the pliers about the circumference of the connector and, through judgment, select an equidistant position from the first pair of indentations. It has been found that a single three spaced indentation is more quickly effected and that it is generally more than the full equivalent in strength of four or more indentations.

The tool is designed to form three indentations, simultaneously and equally spaced around the fitting, with one squeeze of the indenter tool. Tests have proved that the pressure applied to three equally spaced points around the fitting eliminates distortion of tubing shape and does not disturb the fixed penetration which the tool forms in the combined parts.

The customary two point indenter tool, which requires two to three pair of indentations, tends to deform the fitting by offsetting the initial pair of indentations, distorting the fitting initially in one direction and, then, through further indentation, distorting the fitting in an opposite direction.

The particular type of plier-like indenter of this invention is uniquely constructed and assembled so as to provide equispaced indentations. Generally, the plier comprises opposing jaws supported in bifurcated ends of a yoke and, where in each jaw and in the yoke base, there is an indenter pin. The yoke portion of the pliers provides a floating support onto which, generally, the connector tube is laid, the handles upon being squeezed immediately centrally position the conduit impressing therein three indentations to secure the connection. The construction and the advantages of such plier-like indenter will be readily apparent from the following description and the illustrated embodiment as shown in the accompanying drawing, where:

FIGURE 1 is a plan view of the novel plier-like indenter tool embodying the herein mentioned principles;

FIGURE 2 is a side view of the head portion of FIGURE 1;

2

FIGURE 3 represents fragmental sections of a conduit connection being effected by the indenter of FIGURE 1; FIGURE 4 is a top view of FIGURE 1;

FIGURE 5 is an enlarged fragmentary portion of FIGURE 1, showing in the open position the location of the indenter pins or lugs; and

FIGURE 6 is a detail, in partial section, of the indenter as it closes upon a conduit.

The indenter pliers 10 of FIGURE 1 is shown to be a combination of a pair of sturdy jaw-like members 11 and 12 attached to operational extending members or handles 13 and 14. Each jaw 11, 12 is positioned in one bifurcated end of the yoke 15 and is supported by and pivots about pins 18 and 19 respectively. The pins, also, are positioned in and extend through bifurcated ends of the yoke 15.

This is more clearly shown in FIGURE 2 where the plier-indenter 10 has the jaw 12 member positioned between the bifurcated sides of the yoke 15. The yoke member 15 also has a transverse and arcuate base portion 23 (see FIGURES 5 and 6) making a generally U-shaped yoke element having open ends, between which openings there are positioned the plier jaws 11 and 12. The yoke 15 and the jaws 11, 12 are so constructed that when closed, they form with the yoke base a nearly full circle, the diameter being about that of the tubing to be interconnected. As stated herein, each jaw 11, 12 and the yoke base have an indenter pin or element. The conduit indenting elements 25, 26 and 27 have enlarged cylindrical bases or flared midsections with rod-like base extensions and are positioned in accessible recesses provided for them in the jaw members 11 and 12 and in the yoke 15 base. Each indenter pin or element 25, 26, 27 can be reached for replacement through provided for openings or passages (FIGURES 4 and 5) in the jaws 11, 12 and in the body portion of the yoke member 15 as well. Thus, as shown in FIGURE 5, the indenter element 25 can be knocked out through the opening 40 in the jaw 11, indenter 26 can be knocked out through opening 41 of jaw 12, and indenter 27 can be removed for replacement through an opening 43 provided in the yoke body portion 23 accessible, however, only when channels 30, 31 are combined.

In FIGURE 4, the upper two openings 40, 41 are shown being positioned in recesses provided for them in each jaw 11, 12 or in the upper two-thirds of a circle formed when the pliers is closed. The third indenter element 27 is positioned in the yoke body portion 23 or the middle when viewed from the top. As herein stated, accessibility to the indenter element 27 is had through channels 30, 31 when superimposed and when each arm or the handle portions 13, 14 are spread. When the pliers are opened fully as shown in FIGURE 5, the channel portions 30, 31 line up in the handles or arms 13, 14 to coincide to form a common opening or passage through which a knockout pin can be inserted into the opening 43 for the removal of the indenter pin 27.

A metal conduit through which electrical wires are strung can be quickly joined together through the use of the tool being described. As shown in FIGURE 3, a conduit 35 may be joined to a sleeve or coupling connection 37, or inserted into socket 37A or an enlarged receiving end of the flange portion of a conduit 36 and locked therein by a single use of the indenter tool being brought to bear about the sleeve or flange 37, 37A. A single manual squeezing of the plier indenter will secure the connection in one operation in three places about the circumference. The indentation effected is as shown at 44 in FIGURE 3; both tubular sections 35, 36 are joined in continuity by creasing inwardly the union or coupling connector 37 into the tubes 35, 36 to thus make a locking connection at points 44 of indentation.

The result of indentation 44 and effectiveness is more clearly shown in FIGURE 6. When the plier handles 13, 14 are brought together about the coupling connector 37 positioned about two inside abutting tubing sections 35, 36, the squeezing brings the jaw portions 11, 12 toward each other bearing the connector sleeves 37 downwardly against the indenter pin 27 centering it thereover and also against pins 25, 26. The coupling or connector sleeve 37 and the tubing ends are impressed with three indentations 44 effecting a firm connection. When the jaws are brought together, there is a readjustment about the base pin, the jaws readily pivoting about pins 18 and 19 to effect equalization of forces taking place to locate the connector evenly within the jaws for substantially equal pressure on all indenting pins.

What is claimed is:

1. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and jaw portions, means linkingly interconnecting said plier arms within the area of the jaw portions, and indenting lugs in each of said jaw portions and within the base of said jaws being adapted upon actuation of the plier arms to simultaneously indent a conduit placed within the jaws at at least three points in its circumference.

2. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and arcuate jaw portions, a yoke having bifurcated ends and an arcuate intermediate portion, said jaw portions being positioned in the yoke end bifurcations, pivot pins extending through the yoke ends and the jaw portions positioned therein, said yoke along with said jaws adapted upon closing to encircle a conduit when placed therebetween, and conduit indenting lugs positioned in each jaw and in the yoke.

3. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and arcuate jaw portions, a yoke having bifurcated ends and an arcuate intermediate portion, said jaw portions being positioned in the yoke end bifurcations, pivot pins extending through the yoke ends and the jaw portions positioned therein, said yoke along with said jaws adapted upon closing to encircle a conduit when placed therebetween, and at least three conduit indenting lugs positioned generally equidistant from the other in each jaw and in the yoke.

4. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and arcuate jaw portions, a yoke having bifurcated ends and an arcuate intermediate base portion, said jaw portions being positioned in the yoke end bifurcation, pivot pins extending through

the yoke ends and the jaw portions positioned therein, said yoke along with said jaws adapted upon closing to encircle a conduit when placed therebetween, conduit indenting lugs positioned in each jaw and in the yoke base and outside access passages in each jaw and the yoke base to the lugs for subsequent replacement thereof.

5. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and jaw portions, the one joined to the other through a crossing shoulder portion, each shoulder portion having a channel, said channels upon full plier opening coinciding to make an access passage to a lug positioned in the base of the plier jaws, a yoke having open ends with an intermediate arcuate base portion, pivot pins extending through the yoke ends and the jaws positioned therein, said jaws and said base yoke portion being adapted to substantially encircle a conduit when placed therebetween, conduit indenting lugs positioned in each jaw and in the yoke base, and outside access passages in each jaw and in the yoke base to the said lugs for their replacement, one of said passages being the shoulder formed channel.

6. A plier-like indenter tool comprising, a pair of opposing plier arms having arm and jaw portions, the arm joined to the jaw through a crossing shoulder portion, each shoulder portion having a channel, said channels upon full plier opening coinciding to make an access passage to reach a lug positioned in the base of the plier jaws, a yoke having open ends with an intermediate arcuate base portion, said jaw portions being positioned in the open yoke ends, pivot pins extending through the yoke ends and the jaws positioned therein, said jaws and said base yoke portion being adapted to substantially encircle a conduit when placed therein, conduit indenting lugs positioned in each jaw and in the yoke base, outside access passages in each jaw and in the yoke base to the lugs for their removal, and the said shoulder formed channel opening providing the access to the passage in the base portion of the yoke.

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RICHARD J. HERBST, *Primary Examiner.*

R. D. GREFE, *Assistant Examiner.*