United States Patent

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[54] **CRIMPING TOOL**
6 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **140/106,** 72/463
[51] **Int. Cl.** **B21f 1/00**
[50] **Field of Search** 140/106, 123; 72/409, 463; 81/416

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ABSTRACT: A plierlike tool for crimping the pigtail leads of electronic components has a protuberance in the active face of one plier jaw and a matching groove in the active face of the other plier jaw. A hole is drilled through the pivotal connection between the two jaws, to accommodate a long pigtail lead being crimped.

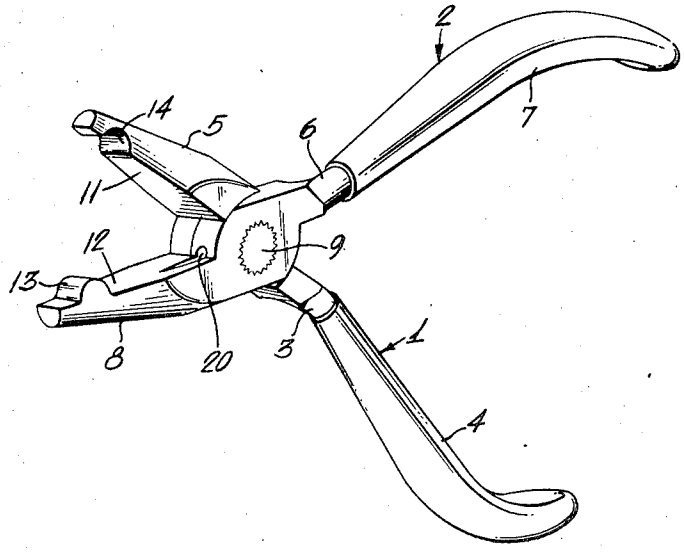


FIG. 1.

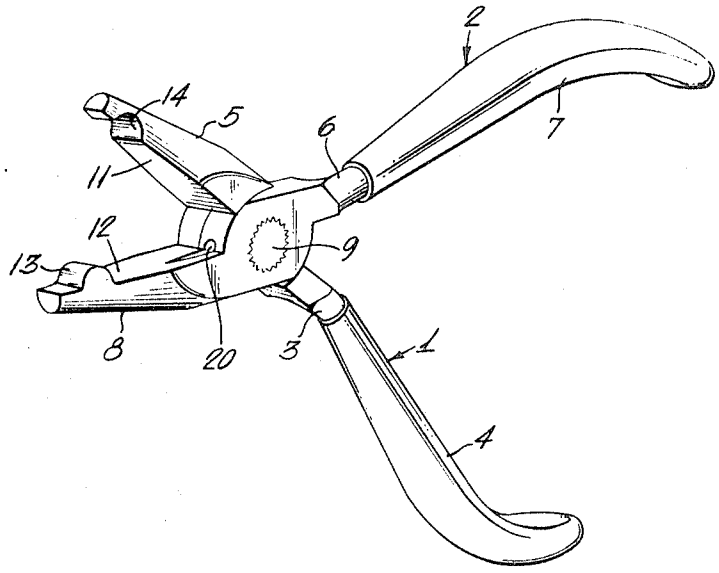


FIG. 3.

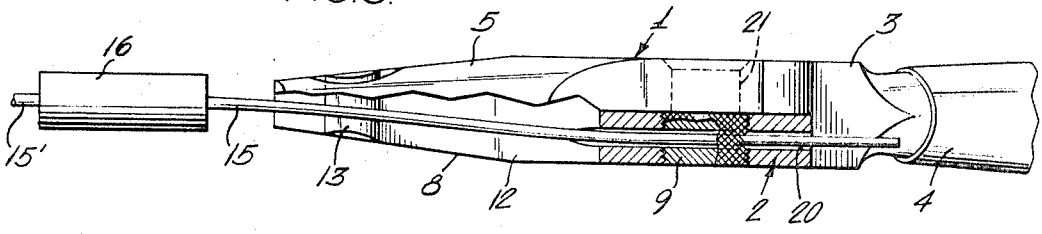


FIG. 2.

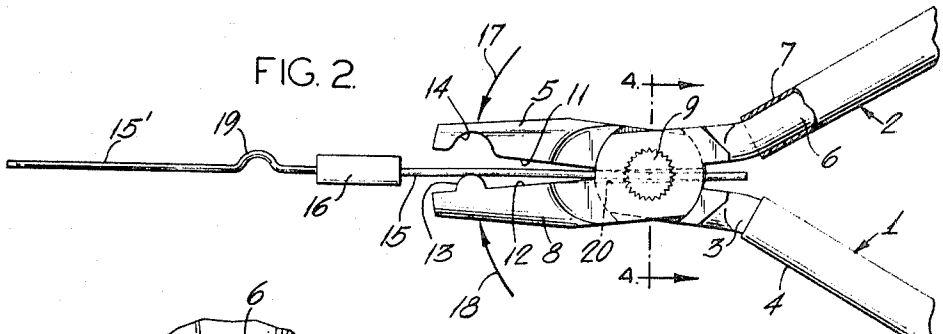
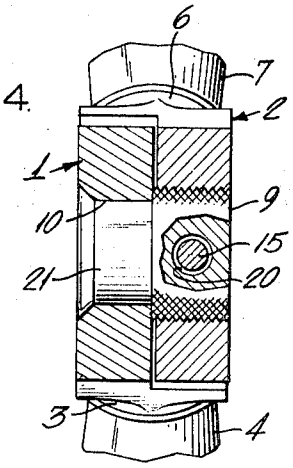


FIG. 4.



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CRIMPING TOOL

This invention relates to a device or tool for crimping wires, such as the pigtail electrical leads of electronic components (resistors, capacitors, etc.).

In the electronics art, particularly in connection with the wiring of electronic components such as resistors into printed circuit boards, there has arisen a need for some sort of strain relief for the body of the component, to prevent damage to such body upon movement of the soldered (connected) ends of the pigtail leads, or upon movement of the body itself. One convenient way of providing this strain relief is to crimp the pigtail leads of the component at a location between the end of each such lead and the body of the component, thereby providing a certain degree of flexibility or "give" in the (crimped) lead.

An object of this invention is to provide a novel crimping tool.

Another object is to provide a simple and inexpensive tool for crimping the pigtail leads of electronic components.

The objects of this invention are accomplished, briefly, in the following manner: A pair of rigid elongated members each having a handle portion and a jaw portion are pivotally connected together to form a plierlike tool having opposed coacting jaws, one of the jaws having a protuberance formed in its face and the other having a matching groove formed in its face. A hole is drilled in one of the members extending through the joint between the two members, to accommodate a long pigtail lead. A detailed description of the invention follows, taken in conjunction with the accompanying drawing, wherein:

FIG. 1 is a pictorial view illustrating the crimping tool of this invention, the jaws being shown open;

FIG. 2 is a side view of the tool, illustrating the tool being used for crimping a wire (pigtail lead);

FIG. 3 is a top or plan view of the FIG. 2 arrangement, partly broken away and drawn on an enlarged scale; and

FIG. 4 is a sectional view taken on line 4—4 of FIG. 2 and drawn on an enlarged scale.

Referring now to the drawing, the device to be described is based upon or modeled upon a rather well-known type of pliers, which are modified in design and construction to produce the crimping tool of the invention. Such pliers may be long-nosed electrician's pliers which are rather blunt at the ends and of rather small overall length. The tool of the invention utilizes two rigid elongated members denoted generally by numerals 1 and 2, respectively. Member 1 has a handle portion 3 at one end, covered by a conventional sleeve 4 of electrical insulating material, and a jaw portion 5 at its other end. Similarly, member 2 has a handle portion 6 at one end, covered by a conventional sleeve 7 of electrical insulating material, and a jaw portion 8 at its other end.

The members 1 and 2 are pivotally connected together between their jaw portions and their handle portions to provide a plierlike tool with a pair of opposed coacting jaws formed by the jaw portions 5 and 8 of the respective members. To provide this pivotal connection, the base portion of a pin 9 is rigidly secured in a suitable opening in member 2, at a location between its jaw portion 8 and its handle portion 6, and the outwardly projecting portion 21 of this pin is pivotally mounted within a bore 10 provided in member 1, at a location between its jaw portion 5 and its handle portion 3. The pivotal connection described is one which is quite conventionally used to couple two members together to form a pair of pliers. Since the pin 9 is rigidly secured to member 2 with its jaw portion 8, the latter may be thought of as being the "dead" jaw of the plierlike tool.

When the members 1 and 2 are pivotally connected together as above described, a plierlike hand tool is formed, with the jaws 5 and 8 in opposed relation but adapted to coact with each other when the tool is manually operated to bring the active face 11 of jaw 5 into juxtaposition with the active face 12 of jaw 8. The active faces of the jaws 5 and 8 are mainly planar, but such active faces have certain relief features formed therein for effecting a crimping action, as will be described.

The active face 12 of jaw 8 has formed herein, near its outer end, a protuberance 13 which is preferably of substantially semicylindrical outer configuration and which extends across the entire width of the face 12; the axis of the cylinder is substantially parallel to the plane of the active face 12 and may, in fact, lie in such plane.

The active face 11 of jaw 5 has formed therein, near its outer end, a groove 14 which is preferably of substantially semicylindrical shape or cross section and which extends across the entire width of the face 11; the axis of the cylinder is substantially parallel to the plane of the active face 11 and may, in fact, lie in such plane. The protuberance 13 and the groove 14 extend parallel to the pin 9, or substantially at right angles to the side edges of the jaws 5 and 8; the protuberance 13 and the groove 14 are aligned such that the protuberance matches, fits into, or mates with the groove when the jaws of the tool are closed.

It may be seen that when a wire, for example one of the pigtail electrical leads 15 of an electronic component such as a resistor having a body 16, is placed between the active faces of jaws 5 and 8 in a direction wherein such wire extends at substantially 90° to the axes of protuberance 13 and groove 14, then manual operation of the tool (by means of its handles) to move the jaws 5 and 8 toward each other (that is, in the directions indicated by arrows 17 and 18 in FIG. 2) and into engagement will (due to the dielike action of protuberance 13, moving into groove 14) result in crimping the wire, as indicated at 19 in the other pigtail lead 15' in FIG. 2. This crimp 19, of course, resulted from a previous operation of the tool, wherein wire 15' was positioned between the active faces of the jaws 5 and 8. The crimp 19 provides strain relief for the resistor body 16.

The tool of this invention is capable of putting a crimp in pigtail leads 15 or 15' as close to the body 16 as desired, without the necessity of cutting these leads; in other words, they can be left uncut while the crimping is being done. The means which enables this to be accomplished will now be described A hole 20, having a diameter such as to accommodate therein the wire 15 or 15' to be crimped, is drilled in member 2, this hole extending in a direction substantially parallel to the plane of the active face 12 of jaw 8 and extending through pin 9 (see FIG. 4) and also through the material surrounding this pin at the above-described pivotal connection; thus, hole 20 extends entirely through the pivotal connection between members 1 and 2, opening at one end into the space between jaws 5 and 8, substantially tangent to face 12 of jaw 8 (see FIG. 1), and at its other end into the space between handles 3 and 6, substantially tangent to the inner face of handle 6 (see FIG. 2).

As illustrated in FIGS. 2 and 3, the pigtail lead or wire 15 to be crimped may be fed into and through hole 20 to the extent desired (to properly position the crimp, along the length of the wire) before the jaws 5 and 8 are closed to effect the crimping. Thus, the crimping tool of this invention is applicable to pigtail leads of any length. It may be noted that, because the hole 20 is provided at the "dead" jaw 8, and is drilled through member 2 and through the portion of pin 9 which is fixed to member 2, the hole 20, and the pigtail lead which may be positioned in this hole, do not interfere in any way with the pivotal movement of jaws 5 and 8.

I claim:

1. A device for crimping wires for strain-relief purposes, comprising a pair of rigid elongated members each having a handle portion at one end and a jaw portion at its other end; and a pin rigidly secured to one of said members, said pin passing rotatably through a bore provided in the other of said members, thereby to pivotally connect said members together between their jaw portions and their handle portions to provide a plierlike tool with a pair of opposed coacting jaws formed by the jaw portions of the respective members, one of said jaws having a protuberance formed in its active face and

the other of said jaws having a matching groove formed in its active face; said one member having therein a hole extending in a direction substantially parallel to the plane of the active face of the jaw provided by said one member, said hole extending through said pin and entirely through the pivotal connection between said members and having a diameter such as to accommodate therein the wire to be crimped.

2. Device as defined in claim 1, wherein said pin is rigidly secured to the member which has said protuberance in its jaw portion.

3. Device as defined in claim 1, wherein said protuberance extends across the entire width of the active face of said one jaw and is of substantially semicylindrical outer configuration, the axis of the cylinder being substantially parallel to the plane of the active face of said one jaw.

4. Device as defined in claim 1, wherein said groove extends across the entire width of the active face of said other jaw and is of substantially semicylindrical shape, the axis of the cylinder being substantially parallel to the plane of the active face of said other jaw.

5. Device as defined in claim 1 wherein said pin is rigidly secured to the member which has said protuberance in its jaw portion, and wherein said protuberance extends across the entire width of the active face of said one jaw and is of substantially semicylindrical outer configuration, the axis of the cylinder being substantially parallel to the plane of the active face of said one jaw.

6. Device as defined in claim 1, wherein said protuberance extends across the entire width of the active face of said one jaw and is of substantially semicylindrical outer configuration, the axis of the cylinder being substantially parallel to the plane of the active face of said one jaw, and wherein said groove extends across the entire width of the active face of said other jaw and is of substantially semicylindrical shape, the axis of the cylinder being substantially parallel to the plane of the active face of said other jaw.

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