# United States Patent [19]

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[11] **3,871,078**

[45] **Mar. 18, 1975**


[54] **WIRE INSULATION STRIPPER**


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[22] Filed: **Mar. 12, 1973**

[21] Appl. No.: **340,024**

[52] **U.S. Cl.** ..... **30/90.1**

[51] **Int. Cl.** ..... **H02g 1/12**

[58] **Field of Search** ..... 7/5.4, 5.6; 30/90.1; 81/9.5 R



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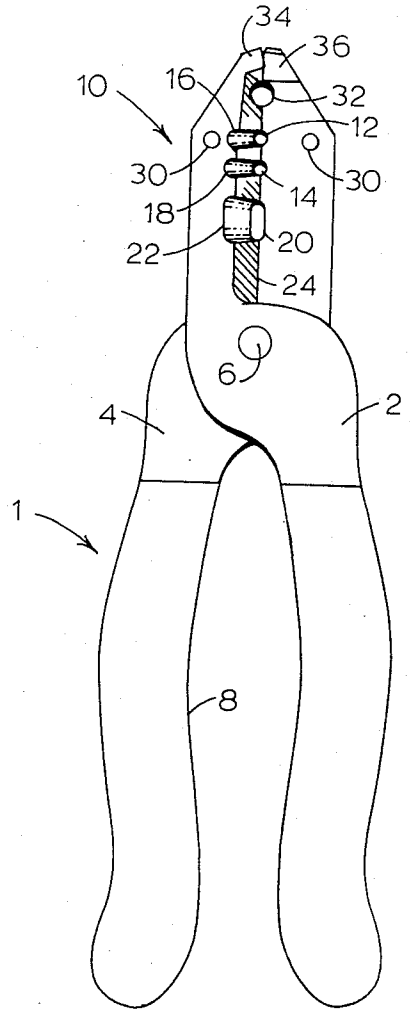
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[57] **ABSTRACT**

A wire insulation stripper hand tool has first and second opposed scissors-connected elements. The jaws are beveled outward and rearward, forming knife-like edges which slightly overlap. Complementary recesses in the jaws form a plurality of circles and an elongated curved-end opening when the jaws are overlapped. The recesses have beveled and sharpened edges similar to the remainder of the jaws. The outermost opening has straight walls and is used for gripping and bending. Tips of the jaws are ground rearward from a line extended along the knife edges, and the tips are bent inward to form abutments to prevent excessive overlapping travel of the jaws and to maintain the complementary recessed openings at desired sizes. Straight walled holes in the jaws remote from the edges are used for gripping and bending wires. Handles are curved outward from the hinge pin and then are curved inward and then outward to facilitate gripping and to prevent slipping in the palm of a hand.


**6 Claims, 3 Drawing Figures**



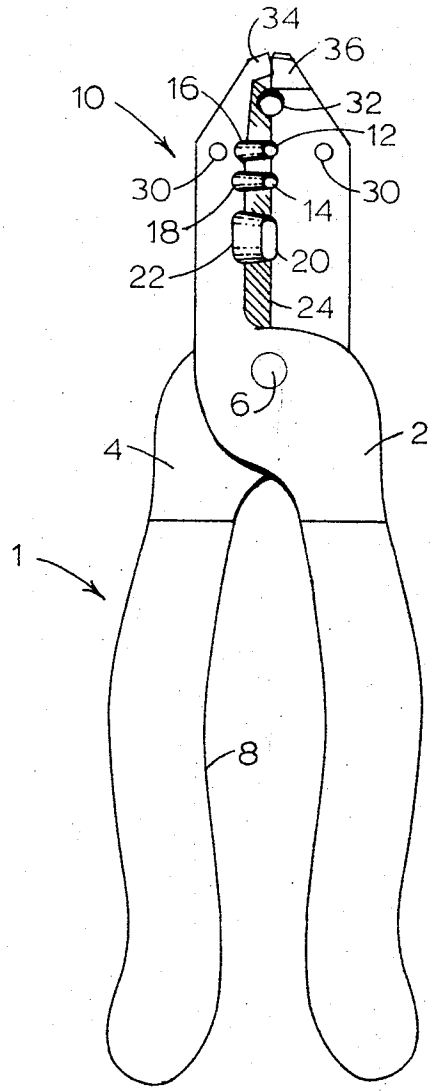



FIG. 1

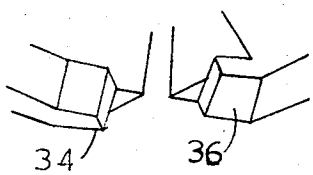



FIG. 2

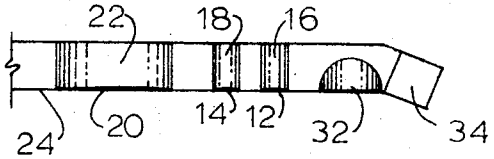



FIG. 3

# WIRE INSULATION STRIPPER

## BACKGROUND OF THE INVENTION

The use of specialized hand tools by electricians to cut wires, to hold and bend wires and to strip insulation from wires is well known. Heretofore, no tools have been known which perform stripping, cutting and bending functions. No such tool has been provided in a simple, economical, flat and easy-to-carry construction.

No previously known hand tool has provided for the removal of an outer sheath from a double encased wire and for the stripping of insulation from two similar wires at the same time. Wires which are insulated separately and then are encased in an outer sheath are widely used by electricians. One conventional form of such wire is known as Romex No. 14-2. In making connections with the wire, an electrician must first cut the wire to a desired length and then must remove the outer sheath before separately stripping the two wires. Such a job usually requires several steps. For example, an electrician may hold a wire in one hand, select a diagonal cutter from his tool pouch, cut the wire to the desired length, return the diagonal cutter to the pouch, select a knife, open the knife and slit the outer insulation, close the knife and return it, find a pair of long-nose pliers and pull the severed sheath portion from the end of the insulated wires, return the long-nose pliers, select a wire stripper, clamp the stripper on one wire and cut and pull the insulation and then clamp and cut the insulation on the other wire and pull the insulation from the wire, return the stripper to the tool receptable, find the needle-nose pliers and bend the ends of the wires in the desired shape for connection and then return the needle-nose pliers to the receptacle before making the connection. Some of the steps may be eliminated by using one or more of the tools for secondary purposes for which the tools are not intended and are not designed and for which the particular tools may be inefficient.

## SUMMARY OF THE INVENTION

The present invention provides a single tool to eliminate multiple steps of preparing wires for electrical connections. A single tool is provided to perform all of the cutting, removing, stripping and bending steps. The wire is inserted between the open jaws of the tool. One squeezing of the handle severs the wire at the desired length. The jaws are then slightly opened while the sheathed wire is advanced through the jaws and is slightly moved outward with respect to the hinge. The handles are again squeezed, causing the severing of the sheath, and the wire is pulled through the opening in the jaws, removing the severed portion of the sheath. The jaws are slightly open, and the exposed double insulated wires are moved between the jaws and are moved slightly outward into the twin recessed and beveled openings. The handles are squeezed, cutting through the insulation, and the wire is pulled from the jaws, stripping the insulation from the wires. The wires are then reinserted in the straight walled holes and are bent in the desired radii for making connection. All of the operations are completed by gripping and releasing a single hand tool and by reciprocating the wire in advancement and withdrawal through the concurrently opened and closed hand tool while successively moving the wire outward in steps.



In a preferred embodiment of the invention, the hand tool is made of two similar elements joined in opposition by a hinge pin. Each element is substantially flat and is formed in a plane. Handle portions are curved outward, then inward, then outward from the hinge pin to promote ease of gripping. The jaws are beveled outward and rearward from inward edges to form knife-like overlapping portions and knife-like edges of recessed portions. The inner, overlapping, beveled edges of the jaws form a cutter portion. An elongated, beveled edge and curved-end recess in each jaw edge cooperates with an opposing recess in the opposite jaw to form an outer sheath slicer and remover. A plurality of semicircular, beveled wall recesses positioned outward from the elongated recess cooperate with the opposing recesses to slice insulation from one or more coated wires simultaneously and to strip the insulation from the plurality of wires. In one embodiment, two semicircular recesses are formed in each jaw.

A large semicircular recess with straight walls is positioned outward from the stripping semicircular recesses in each jaw edge. The straight walled recess may be used for gripping and bending wires. The outer tips of the jaws are bent inward, and flat faces of the tips are positioned rearward from extended lines of the sharp edges to provide abutments for controlling the amounts of overlapping of the knife-like jaw edges. Holes in the outer areas of the jaws provide for insertion and bending of insulated or stripped wires.

Broad objectives of the invention are accomplished by providing a wire insulation stripper hand tool with integrally connected jaws and handles hinged by a pin and with at least one of the jaws having beveled cutting edges and having beveled recess edges for stripping insulation.

Another object of the invention is accomplished by providing wire insulation stripper hand tool apparatus with integrally connected jaws and handles joined in scissors like relationship and with opposing overlapping edges of the jaws being beveled outward and rearward in knife-like fashion and with edges of elongated recesses and plural semicircular recesses being beveled for stripping sheaths from multiple wire assemblies and for stripping insulation from individual wires.

These and other objects and features of the invention are apparent in the disclosure, which includes the drawings and specification, which is the foregoing and ongoing description, together with the claims.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an assembled elevational view of the wire insulation stripper hand tool apparatus of the present invention.

FIG. **2** is a detail of the overlapping jaws and abutments.

FIG. **3** is a detail of the jaw faces.

## DETAILED DESCRIPTION OF THE DRAWINGS

With reference to FIG. **1**, a wire cutting and stripping tool is generally indicated by the numeral **1**. The tool is formed of two similar elements **2** and **4**, which are joined by a hinge pin **6**. Handles **8** of the elements are curved outward, then inward and outward, to form a convenient grip for the palm of a hand. The jaw portions of the elements are generally referred to by the numeral **10**. Opposed semicircular recesses **12** and **14** together form circular openings for the stripping of in-

sulation from wires. Beveled, curved, semicircular channels **16** and **18** extend outward and rearward from semicircular openings **12** and **14** for forming sharp knife edges at the semicircular recesses.

Elongated, curved-end recesses **20** in each blade have bevels **22** which extend outward and rearward to form knife-like edges on the elongated recesses **20.** After a wire is cut to a desired length, the wire is placed in recesses **20,** and the jaws are closed to sever the outer sheath which binds two insulated wires together and which further insulates the wires. Pulling on the wire then draws the severed portion of the sheath from the cut end of the wire. The individually insulated wires from which the sheath has been removed are then placed side by side in semicircular openings **12** and **14.** Closing the jaws cuts the insulation with the knife edges of the semicircular openings, and pulling the wires strips the insulation from the wires. In a preferred embodiment of the invention, when the jaws are closed, the distance between opposed edges of recess **20** is approximately twice the diameter of the circular openings formed by the semicircular recesses **12** and **14** when the jaws are closed.

Beveled edges **24** provide a cutter to cut off the end of wires before they are stripped. The knife-like, beveled edges **24** overlap a short distance to provide a complete cutting action, even for small wires and difficult insulation.

Holes **30,** which are remote from edges of the jaws, are used to hold wires while they are being bent. Larger hole **32,** formed by complementary semicircular recesses in the jaw edges, is used to grip and hold larger diameter wire, such as beveled sheathed wires. Walls of holes **30** and **32** are straight and perpendicular to the axes of the holes to prevent scoring and to provide sharp bends when desired. Abutments **34** and **36** are bent inward from the planes of the jaws to contact each other with flat faces and to prevent overtravel of the overlapping edge portions, while maintaining the desired sizes of openings **12, 14** and **20.**

With the exception of the abutments **34** and **36,** and the area immediately around opening **32,** the entire edge surfaces of the jaws, including the surfaces around openings **12, 14** and **20,** are beveled to form sharp, knife-like edges. As the jaws are closed on the wire which are to be stripped or from which sheaths are to be removed, the sharp edges which encircle the wire score the insulation and slice the insulation. As an example, when insulated wires are placed in openings **12** and **14,** the closing of the jaws first makes separated cuts by slicing lateral lines in the insulation. The continued closing of the jaws finally forces the insulation against the bottoms of the recesses, completing the encircling cuts in the insulations.

In FIG. **2,** hole **32** has been omitted to schematically show the relationship of the abutment to the limiting of travel of the overlapping knife-like edges.

In FIG. **3,** the curved portions of the edges have been shaded, and the flat beveled edges between the curved portions have been left unshaded for contrast.

While the invention has been described with reference to a specific embodiment, it will be obvious to those skilled in the art that modifications of the invention may be made without departing from the spirit and scope of the invention. The scope of the invention is defined in the following claims.

I claim:

**1.** A wire stripper hand tool apparatus comprising a first integrally connected flat jaw and handle element and a second integrally connected flat jaw and handle element of substantially uniform thickness and pin means joining the two elements at complementary points between the jaw and handles in a scissors-like arrangement, the jaws closely overlapping in side-by-side arrangement as in the form of scissors, each jaw having an inward facing and complementary elongated concave depression with curved ends and a straight central portion in opposed surfaces of the jaw, and the jaw further having paired opposed semicircular complementary depressions, at least one of the jaws has a sloping surface extending outward from the elongated depressions and the semi-circular depressions, thereby forming sharp edges at the elongated concave depression and the semicircular depressions, and further comprising complementary oppositely inward bent abutment means on the jaws remote from the pin means for preventing overtravel of the jaws when overlapping, thereby preventing closing of the openings in the jaws, whereby the jaws cut and strip an outer sheath and subsequently cut and strip paired insulated wires within the sheath simultaneously.

**2.** The stripper apparatus of claim **1** wherein at least one of the jaws further comprises a diagonally sloped surface extending away from a mating edge portion of the jaw, thereby forming an elongated cutting surface.

**3.** The apparatus of claim **1** further comprising additional semicircular concave openings at opposed edge surfaces of the jaws with substantially flat surfaces.

**4.** The apparatus of claim **1** further comprising a circular hole through at least one of the jaws remote from mating surfaces of the jaws.

**5.** The stripper hand tool apparatus of claim **1** wherein the entire overlapping surfaces of the jaws and concave surfaces leading away from the openings are beveled in directions outward and rearward, thereby forming sharp overlapping edges for cutting purposes.

**6.** The insulator stripping and cutting hand tool of claim **1** wherein the integral handles and cutting and stripping blade-like jaws are similarly formed and are reversed and joined in back-to-back positions by the pin means, the handles curving outward and then inward and then outward in directions away from the pin means for creating a comfortable positive grip which resists slipping in the hand in any direction, and the blade-like jaw means comprising flat, partially overlapping adjacent surfaces which are uniformly beveled in directions away from each other and rearward with respect to touching edges of the jaws, thereby providing sharp cutting edges.

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