Sept. 8, 1970 J. C. RAY 3,526,945

HAND CRIMPER

Filed March 7, 1968

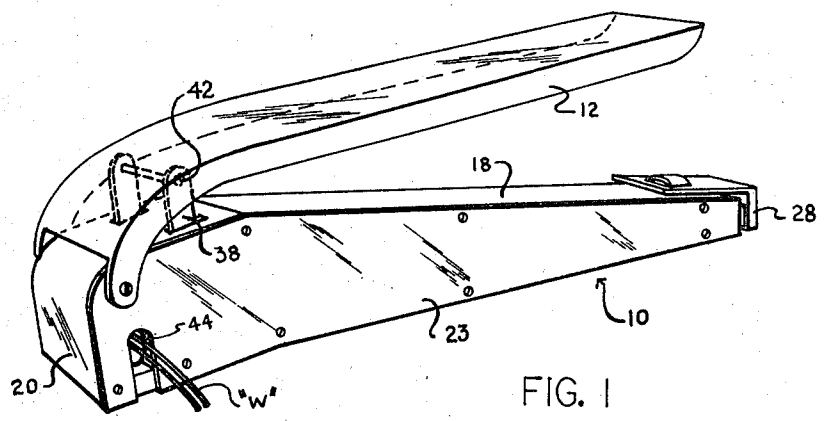


FIG. 1

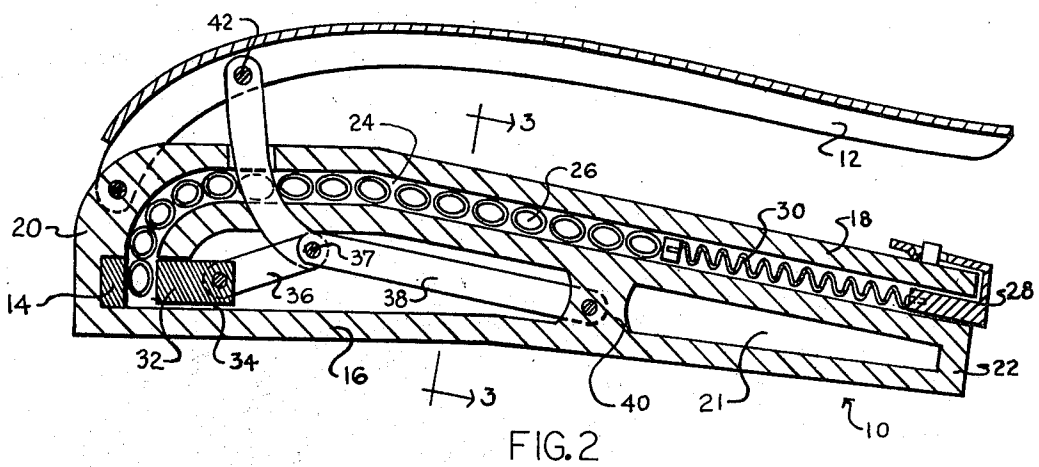


FIG. 2

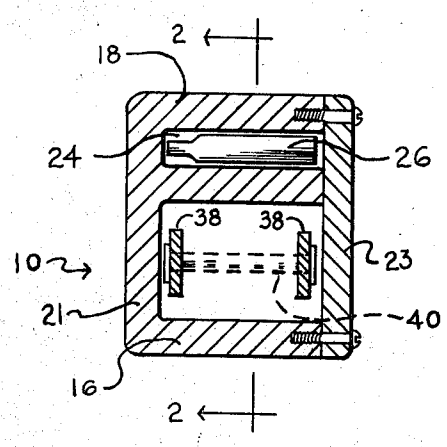


FIG. 3

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HAND CRIMPER

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U.S. Cl. 29—212 3 Claims

ABSTRACT OF THE DISCLOSURE

Connectors for communication wires are crimped one at a time by hand crimper which moves the hammer against the anvil by a toggle mechanism. For strength and simplicity of construction, the anvil and the bottom of the toggle are connected in a unified loop construction in a handle that contains a magazine of connectors.

CROSS-REFERENCE TO RELATED APPLICATIONS

Applicant has filed several previous United States patent applications including Ser. No. 525,506, filed Feb. 7, 1966, Group 320, however, he makes no claim of priority at this time.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to crimpers for connectors for electrical conductors, particularly communication wires.

Description of prior art

Machines to crimp connectors are known to the art, e.g., Phelps et al., U.S. Pat. 1,836,497, shows a massive machine for performing this function. Likewise hand crimpers have been known, such as Miller, U.S. Pat. No. 2,549,838. Also, reference is made to the hand crimpers of the nature of the Over, U.S. Pat. No. 3,328,871, and Reem et al., U.S. Pat. No. 3,328,872.

The Miller patent shows a plier-like instrument with a supply of connectors with in a cavity in one of the handles.

Over and Reem et al., illustrate something of a toggle arrangement for forcing the die or hammer against the anvil.

Vinson, U.S. Pat. No. 2,612,932, and Byrem, U.S. Pat. No. 2,722,146, also show hand crimpers for performing similar functions.

SUMMARY OF THE INVENTION

According to this invention, a lightweight tool is provided, which, by toggle arrangement plus a lever, moves the hammer against the anvil. A magazine of connectors is contained within a cavity within the handle of the tool. By the unique construction of having the anvil connected into a loop so that the hammer moves within the loop, a very strong construction is provided, yet the total weight of the tool is kept very light.

An object of this invention is to provide a hand tool to crimp connectors onto wires.

Other objects of this invention are to achieve the above with a device that is sturdy, lightweight, compact, durable, simple, safe, versatile, reliable and efficient, yet inexpensive and easy to manufacture, operate and maintain.

Further objects are to achieve the above with a tool that is safe, rapid, inexpensive and does not require skilled people to adjust, operate, and maintain.

The specific nature of the invention, as well as other objects, uses, and advantages thereof, will clearly appear from the following description and from the accompanying drawing, the different views of which are not necessarily to the same scale.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a tool according to this invention.

FIG. 2 is a longitudinal sectional view of the tool taken on line 2—2 of FIG. 3.

FIG. 3 is a cross-sectional view of the tool taken on line 3—3 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A tool, according to this invention, includes elongated hollow handle **10** and operating lever **12** pivoted thereto. To maintain lightweight construction, the handle is made of a lightweight metal alloy such as aluminum. To withstand the pressure necessary to properly crimp the connector, anvil **14** made of steel or similar hard metal is inserted into the handle.

The handle **10** is basically in the shape of an elongated loop, with strip of metal **16** extending down one side and strip of metal **18** extending down the other side. These two metal strips **16** and **18** are connected by head **20** and foot **22** and pieces **16**, **18**, **20**, and **22**, are an integral casting together with back plate **21**. Front plate **23** is attached by screws, as illustrated.

The leg or strip of metal **18** has cavity **24** formed therein, forming a container or magazine for a stick of connectors **26**. (Connectors **26** are according to the disclosure of Graff et al., U.S. Pat. 3,064,072, which are commercially on the market.) This cavity **24** has a curve so that the connectors are fed to the anvil **14**. Door **28** in the foot **22** of the handle **10** opens into the cavity **24** so that the stick of connectors **26** may be fed into the cavity **24**. Spring **30** in cavity **24** is attached to the door **28** and feeds the connectors **26** to the anvil **14**.

The connectors **26** are crimped upon a wire by the movement of hammer **32**. The hammer is made of steel or other hard metal and is mounted within slot **34** formed between the legs or strips of metal **16** and **18** adjacent to the anvil **14**. Hammer toggle arm **36** is pivoted to the hammer and to long toggle arm **38**. The long toggle arm **38** and the hammer toggle arm **36** are pivoted together by pivot **37** at about the middle of the long toggle arm **38**. The foot end of the long toggle arm **38** is pivoted to ear **40**, which is formed in the handle and which interconnects the legs **16** and **18**. Therefore, it may be seen that when the toggle is closed (i.e., when the pivot between the arms **36** and **38** move in line with the hammer **32** and the ear **40**) there is extreme pressure extended, forcing the hammer **32** against the anvil **14**. Likewise there will be a great deal of pressure forcing the anvil **14** and the ear **40** apart. However, inasmuch as the anvil and ear are connected together with the leg of metal **16** on one side and **18** on the other side and the back **21** on the third side, a very strong construction results. The legs **16** and **18** are in tension and have no bending moment on either of them. Therefore, a very rigid construction results without thick sections of metal, resulting in a lightweight tool that can be easily carried by the operator.

The head end of the long toggle arm **38** is pivoted by pin **42** to the operating lever **12**. Front plate **23** has aperture **44** therein to expose the connector **26** at the anvil **14**. The connector **26** will be positioned at the anvil by the action of spring **30**.

In operation, the tool is grasped in one hand and wires W held in the other hand. The operator inserts the wires into the connector **26** which is positioned at the anvil **14**. He then squeezes operating lever **12** toward the handle

10 causing the long toggle arm 38 to move inward, moving the pivot 37 in line between the ear 40 and the anvil 14 thus crimping the connector 26. After the connector is crimped, the operator pulls upon the wires within the connector thus removing that connector from the crimper. The spring 30 forces another connector into position. When the supply of connectors 26 is exhausted from the cavity 24, the door 28 is opened and another stick of connectors 26 is inserted within the cavity 24.

Thus it may be seen that I have provided a lightweight, efficient tool to crimp connectors.

It will be apparent that the embodiment shown is only exemplary and that various modifications can be made in operation, construction, materials, and arrangement within the scope of the invention as defined in the appended claims.

I claim as my invention:

1. A hand crimper for crimping a connector onto communication wires comprising:

(a) an elongated handle adapted to contain a plurality of connectors,

(b) an anvil at one end of the handle,

(c) a hammer mounted for movement toward and away from the anvil,

(d) an operating linkage interconnecting the hammer and handle for forcing the hammer toward the anvil, and

(e) a lever pivoted to the handle and connected to the linkage for operating the linkage,

(f) said handle formed in the shape of a loop so that said anvil at one end of the handle has structural support on two sides thereof,

(g) said linkage extending within said loop for greater strength, and to force the hammer toward the anvil to crimp a tubular connector on a wire.

2. The invention as defined in claim 1 with the additional limitation of

(h) said handle having an elongated cavity therein,

(j) said cavity terminating at said anvil,

(k) a spring in the cavity,

(m) said cavity forming means for containing a plurality of connectors.

3. The invention as defined in claim 1 with the additional limitation of said linkage including

(h) a hammer toggle arm pivoted to the hammer, and

(j) a long toggle arm pivoted to the handle and pivoted to the hammer toggle arm and pivoted to the lever.

References Cited

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U.S. Cl. X.R.

29—203