Sept. 1, 1964 J. H. MAILLOUX 3,146,820

TUBING ROLLING TOOL

Filed July 30, 1962

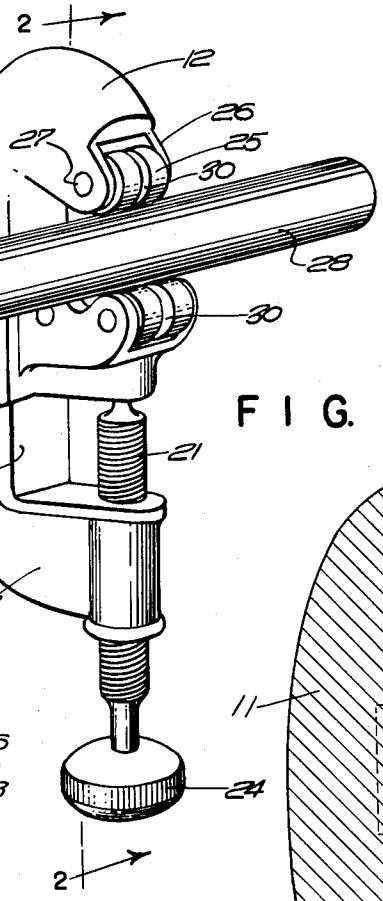

FIG. 1

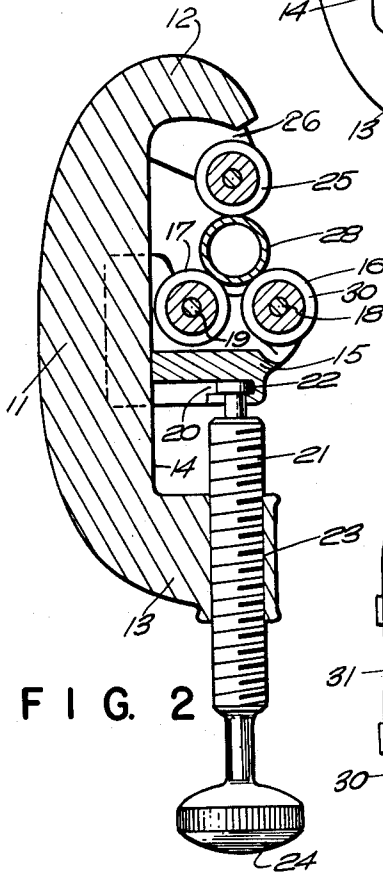

FIG. 2

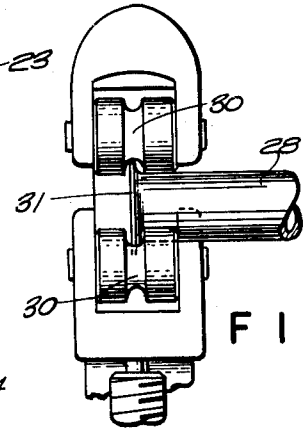

FIG. 3

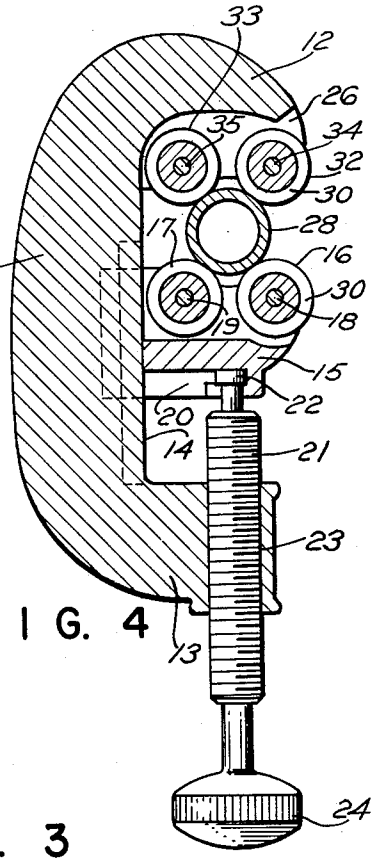

FIG. 4

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United States Patent Office 3,146,820 Patented Sept. 1, 1964

3,146,820

TUBING ROLLING TOOL

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Filed July 30, 1962, Ser. No. 213,478
3 Claims. (Cl. 153—54)

This invention relates to a tool for rolling tubing, such for instance as copper tubing as is used in the trade.

This application is a continuation-in-part of my co-pending application, Serial Number 14,607, filed March 14, 1960.

In the use of soft copper tubing, it is frequently desirable to bend the tubing so as to dispose it for connecting different locations without the use of angle fittings. In the bending of such soft tubing, some special tools are often needed to prevent collapsing of the tubing on itself. However, if the ubing is hardened at the locations of the bend of the tubing, the tubing then resists such collapsing during bending and is maintained in substantially uniform interior and exterior cross section. Also in the use of tubing, flaring of the tubing is often done for providing a fitting at the end, and in this flaring the tubing may become distorted or out of round, and it is desired that the tubing be rerounded. Also when the flaring is performed, sometimes the flaring is made too large and it is difficult to reduce the flaring.

One of the objects of this invention is to provide a device which will round the tubing intermediate its ends for hardening the tubing for bending so as to resist collapsing.

Another object of the invention is to provide a device which will serve either intermediate the ends of a tubing or back of its flare to reround the tubing so that a ferrule or other part may slide more freely over the tubing.

A still further object of the invention is to provide a device which although performing the above said objects will also be suitable for reducing the flare on a tubing should the tubing be provided with a flare too large in diameter.

A still further object of the invention is to provide a hand device which will be of extremely simple construction and one which may be easily carried about for performing the objects above mentioned.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIG. 1 is a perspective view of the rolling tool constructed in accordance with this invention shown as engaging a piece of tubing;

FIG. 2 is a central section on line 2—2 of FIG. 1;

FIG. 3 is a fragmental end view illustrating the flared end of the tubing as engaged in the groove in the rolls of the device; and

FIG. 4 is a central section similar to FIG. 2 of a modified form of the device.

In proceeding with this invention, I have provided a generally C-shaped frame with the arms and central portion of the frame in generally co-planar relation and have mounted a carriage movably on the central portion of the frame, which carriage will carry a pair of rolls, and I have provided in one of the arms a cooperating roller or rollers to engage the tube. An actuating means for the carriage consisting of a screw which passes through the other arm of the device is used for applying pressure on the tube and adjusting the carriage for various size tubing. Each of the rollers is grooved centrally, all of the grooves being in substantially the same plane at right angles to the axis of the rollers, so that a flare on the end of a tube may be reduced by engagement at the grooves and applying pressure while rotating the tool about the tubing.

With reference to the drawings, the frame **10** is shown as generally C-shaped with a central portion **11** connecting arms **12** and **13**. The central portion is provided with a slideway **14** in substantially single plane with undercut edges, and a carriage **15** is slidably mounted upon this slideway **14** with inturned edges to embrace the slideway and maintain the carriage in sliding relation.

The carriage is provided with a pair of rollers **16** and **17** on pivot pins **18** and **19**, the axes of which pivot pins are at right angles or perpendicular to the general plane of the two arms **12** and **13** and the central portion **11** connecting them. This carriage is provided with a T-slot **20** and a screw **21** having a T-head **22** enters this slot and is threadedly mounted through the threaded bore **23** of the arm **13**. A handle **24** serves for adjusting the carriage along the slide **14**.

In one form of the invention a roller **25** is mounted on the arm **12** at the bifurcated portion **26** thereof by means of a pivot pin or axle **27**. This pin also has its axis parallel to axes of the rolls **16** and **17** and thus at right angles or perpendicular to the general plane of the central portion and arms of the frame.

In another form of the invention, a pair of rollers **32** and **33** are mounted in the bifurcated portion **26** of arm **12** as shown in FIG. 4 by means of pivot pins or axles **34** and **35**. These pins or axles also have their axes parallel to the axes of the rolls **16** and **17** and thus at right angles or perpendicular to the general plane of the central portion of the arms of the frame.

By the arrangement shown in FIGS. 1 and 2, a tube **28** may be positioned at any point intermediate its ends partially between roll **16** and **17**, and the carriage moved so engagement is had with roll **25**. By the arrangement shown in FIG. 4, the tube **28** may be positioned at any point intermediate its ends partially between the rolls **16** and **17** and the rolls **32** and **33**. With the tube so positioned in either arrangement by revolving the tool about the axis of tube **28** as a center, these rolls will roll about tube, and by applying pressure gradually through the movement of the handle **24**, the tube may be ironed or rolled so as to harden its outer surface, presenting it in a condition so it will resist collapsing if bent at an angle to its longitudinal axis. The same rolling action will reround the tube if it has become slightly out of round, thus enabling a ferrule or any part through which the tube is slid to be moved along the tube. This is of especial advantage where flaring has been done by driving a flaring tool into the end of a tubing but not driven in squarely in line with the axis of the tubing.

The arrangement shown in FIG. 4 was found to be a little more stable than the arrangement shown in FIG. 2 in preventing twisting of the tool as it is rotated about the tubing.

The rolls **16**, **17** and **25** or **32** and **33** are provided with grooves **30** to receive the flared end **31** of a tube, such as **28** (see FIG. 3). The grooves are in the same plane in all of the rolls so that the edge of the flare will be engaged at several equally angular points in substantially a single plane when it is positioned in the grooves **30**. The grooves will be sufficiently shallow so the flare **30** will engage the bottom of the groove before the other parts of the roll engage the body portion of the tubing **28**, and thus by pressure on this flare portion as the tool is rotated about the axis of the tubing, the flare will be reduced, bringing it back to the size desired by a number of rotations of the tool with the pressure being increased as the flare is reduced.

I claim:

1. A hand tool for rolling tubing comprising a C-shaped frame having two arms and a central portion between in generally co-planar relation, a carriage movably related to said central portion for movement between said arms,

a screw in one of said arms for moving said carriage toward and from the other arm, and smooth rollers on said other arm and on said carriage, two rollers on one part and at least one on the other, said rollers presenting opposite smooth cylindrical surfaces having a line contact with the work parallel to their axes, said surfaces having circumferential grooves, said grooves being arcuate and in a single plane at right angles to their axes to engage the flared end of a tube for reducing the diameter of the flare.

2. A hand tool for rolling tubing as in claim 1 wherein a single roller is carried by said arm and two rollers are carried by said carriage spaced to receive partly between them the flare of a tubing to be rolled.

3. A hand tool for rolling tubing as in claim 1 wherein two rollers are carreid by said arm and two rollers are

carried by said carriage spaced to receive partly between them the flare of a tubing to be rolled.

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