May 6, 1969 T. M. SNOWDEN 3,442,114

BODY PANEL FLANGE BENDING AIR HAMMER ATTACHMENT

Filed Dec. 13, 1966

Fig. 1

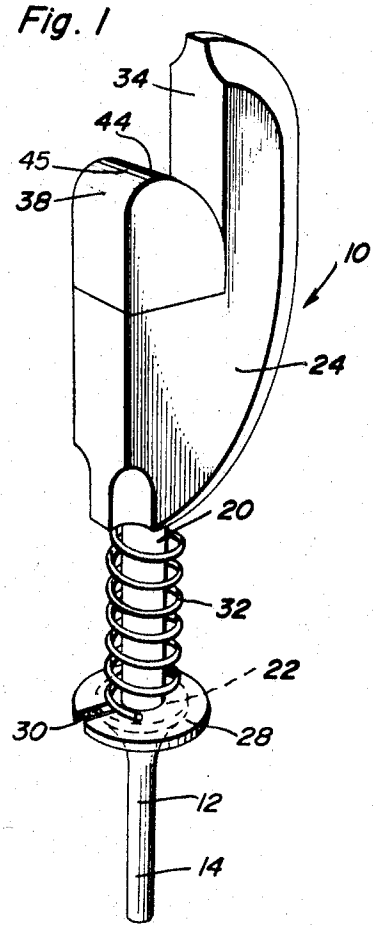


Fig. 2

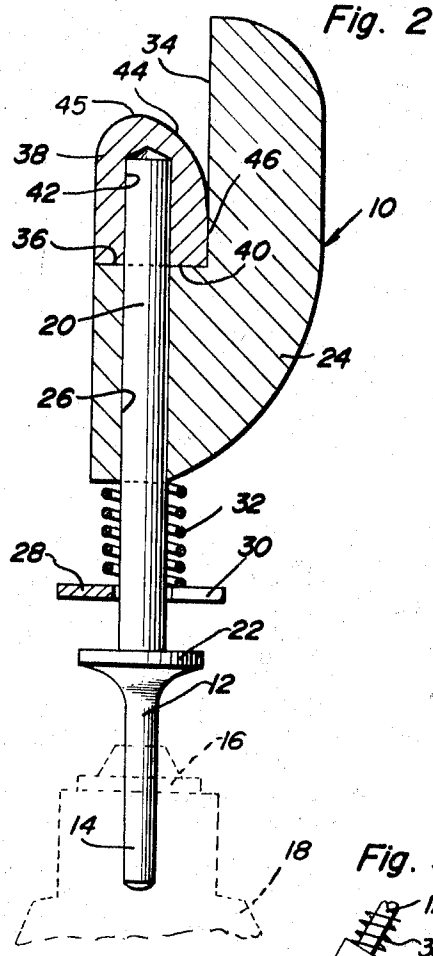


Fig. 3

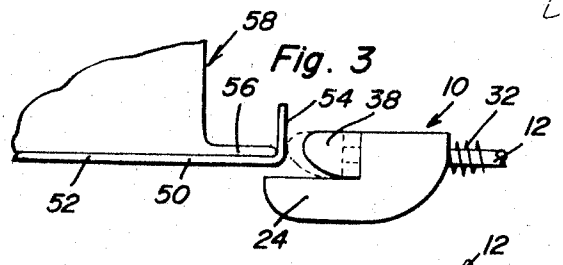


Fig. 4

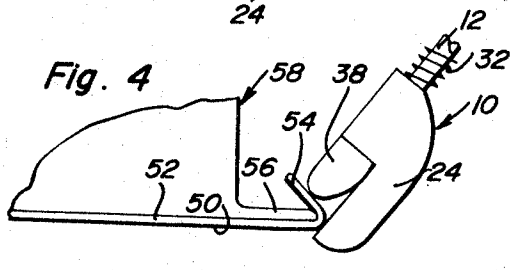
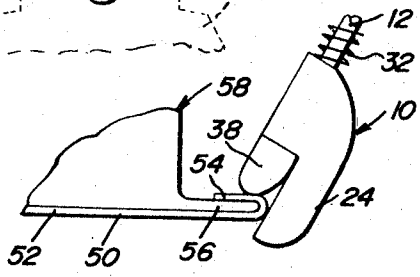


Fig. 5



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BODY PANEL FLANGE BENDING AIR HAMMER ATTACHMENT

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U.S. Cl. 72—465 2 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure pertains to an attachment for an air hammer including a reciprocating chuck from which the attachment is to be supported. The attachment is specifically designed to provide a guide for properly positioning the impact member of the attachment for impact with a body panel flange which is to be bent and simultaneously cause the impact member to impact with the flange in a manner crimping the flange over an associated body panel portion.

This invention relates to a novel and useful air hammer attachment and more specifically to an air hammer attachment designed to crimp a body panel flange over a portion of an adjacent body panel section while simultaneously providing means whereby the hammer attachment is guided relative to the work and the direction of impact of the impact member of the attachment may be varied by the operator of the associated air hammer as desired.

In many phases of sheet metal working it is often necesary to secure one section of sheet metal to another by crimping a flange portion of the first sheet metal section over a portion of the second sheet metal section. In one particular phase of sheet metal working, automotive body repairing, replaceable sheet metal sections such as outer door panels include peripheral edge portions which are crimped over and secured to other sheet metal sections of the door. When an outer door panel, either complete or a specific section thereof, is damaged to the extent that it may not be inexpensively repaired and yet the remainder of the door has incurred little or no damage, it is often least expensive and less troublesome to replace either the whole outer door panel or a predetermined section thereof in which the outer door panel has been damaged. In this instance, the whole or partial outer door panel may be removed from the remainder of the door by straightening crimped peripheral flange portions of the outer panel from engagement with adjacent portions of the remainder of the door and thereafter a corresponding new outer door panel or section thereof is placed in proper position relative to the remainder of the door and peripheral flange portions of the new panel or section thereof are crimped over adjacent portions of the remainder of the door so as to secure the new panel or portion thereof to the door.

The attachment of the instant invention is specifically designed to perform the function of evenly and precisely crimping the peripheral flange portions of a new body panel over adjacent portions of an associated body portion so as to secure the new sheet metal structure in its proper position. Of course, after such a peripheral flange crimping operation has been carried out, other means such as spot-welding, gas-welding or arc-welding may be utilized as further means to secure the new body panel in position.

The main object of this invention is to provide a body panel flange bending air hammer attachment operable in conjunction with a conventional air hammer to smoothly and evenly crimp body panel flange portions as desired.

Another object of this invention is to provide an attachment in accordance with the preceding object and constructed in a manner whereby the attachment may be readily most advantageously positioned relative to the body panel flange which is to be bent or crimped.

A final object of this invention to be specifically enumerated herein is to provide an attachment in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble-free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the attachment of the instant invention;

FIGURE 2 is a longitudinal sectional view of the attachment taken substantially upon a plane passing through the longitudinal center line thereof and with the chuck portion of a conventional air hammer illustrated in phantom lines supporting the shank portion of the attachment for longitudinal reciprocation; and

FIGURES 3–5 of the drawings are schematic views illustrating successive steps of use of the attachment in bending a peripheral flange portion of an outer door panel over an adjecent flange portion of the remainder of a vehicle body door.

Referring now more specifically to the drawings the numeral **10** generally designates the attachment of the instant invention. The attachment **10** includes an elongated shank **12** having one end portion **14** adapted for removable securement in the chuck portion **16** of a conventional air hammer **18**, the air hammer **18** being operable to longitudinally reciprocate the shank **12**.

The end portion **14** of the shank **12** is somewhat diametrically reduced relative to the opposite end portion **20** of the shank **12** and the latter includes a diametrically enlarged circumferential flange or abutment **22** on whose opposite sides the end portions **14** and **20** are disposed.

A slide **24** is provided and has a smooth bore **26** formed therethrough. The end portion **20** is slidably and rotatably received through the bore **26** and an abutment washer **28** is slidably disposed on the end portion **20** intermediate the slide **24** and the abutment **22**. The washer **28** is radially slotted as at **30** and a compression spring **32** is disposed about the end portion **20** between the slide **24** and the washer **28**.

The slide **24** includes an elongated longitudinally straight guide surface or face **34** disposed to one side of and generally paralleling the end portion **20**. The guide surface **34** is disposed substantially normal to a radius of the end portion **20** extending between the latter and the transverse center of the surface **34**. The guide surface **34** is formed on the end of the slide **20** remote from the abutment **22** and terminates at its end adjacent the abutment **22** in a right angulated abutment surface **36** through which the end portion of the bore **26** remote from the abutment **22** opens. The abutment surface **36** is disposed normal to the longitudinal axis of the bore **26** and the end portion **20** of the shank **12** has a body flange engaging head portion **38** mounted on the terminal end thereof which projects outwardly of the end of the bore **26** remote from the abutment **22**. The end of the head portion **38** adjacent the abutment **22** includes an end surface **40** which is abuttingly engageable with the abutment surface **36** in surface to surface contacting engagement therewith and the head portion **38** includes a blind bore **42** opening through and disposed normal to the surface

40 in which the terminal end portion of the end portion 20 is secured in any convenient manner such as by a minus clearance fit.

The head portion 38 includes a flange abutting surface 44 which includes one marginal portion disposed closely adjacent whose end adjacent surface 40 closely opposes and slidingly and guidingly engages face 34 and whose end remote from surface 40 curves away from face 34 and terminates in a rounded nose surface 45. The slidingly engaged portions of face 34 and surface 44 prevent rotation of the slide 24 about the longitudinal axis of the shank 12 relative to the head portion 38.

In operation, assuming that the end portion 14 is secured in the chuck 16 of the air hammer 18, the attachment 10 is first positioned as illustrated in FIGURE 3 of the drawings after which the air hammer 18 may be actuated and the guide surface 34 may be brought into contact with the outer surface 50 of the outer door panel 52 including a flange portion 54 which is to be crimped over an adjacent flange 56 of a vehicle door generally referred to by the reference numeral 58. As the flange portion 54 is partially crimped over the flange 56 in the manner illustrated in FIGURE 4 of the drawings, the air hammer 18 may be angularly displaced so as to angularly displace the attachment 10 to the position thereof illustrated in FIGURE 4 of the drawings. Thereafter continued operation of the air hammer 18 will further crimp the flange portion 54 over the flange 56 and the final crimping of the flange portion 54 may be carried out by further angularly displacing the attachment 10 during operation of the air hammer 18 to the position of the attachment 10 illustrated in FIGURE 5 of the drawings.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A flange bending attachment for an air hammer of the type including a reciprocal member, said attachment

including an elongated shank adapted at one end for securement to said reciprocal member with the longitudinal axis of said shank generally paralleling the path of reciprocal movement of said reciprocal member, a slide mounted on the other end portion of said shank for reciprocal movement therealong between limit positions and including an elongated generally planar abutment and guide face generally paralleling and adjacent said axis, a engaging portion carried by the other end portion of said shank for movement therewith relative to said slide outwardly of and along said abutment and guide face, means operatively connected between said slide and said shank yieldingly urging said slide toward its limit position away from said one end of said shank, said flange engaging portion including an elongated flange abutting surface extending lengthwise of said shank whose end adjacent said one end of said shank closely opposes and is disposed in guiding and sliding engagement with the corresponding end of said face and whose other end curves smoothly away from said face and terminates in a lengthwise arcuate rounded nose.

2. The combination of claim 1 wherein said slide and flange engaging portion include opposing abutment faces disposed generally normal to said shank and defining a limit of movement of said slide toward said other end of said shank.

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