

[54] SHEET METAL CRIMPING ATTACHMENT
FOR IMPACT GUN

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29/58

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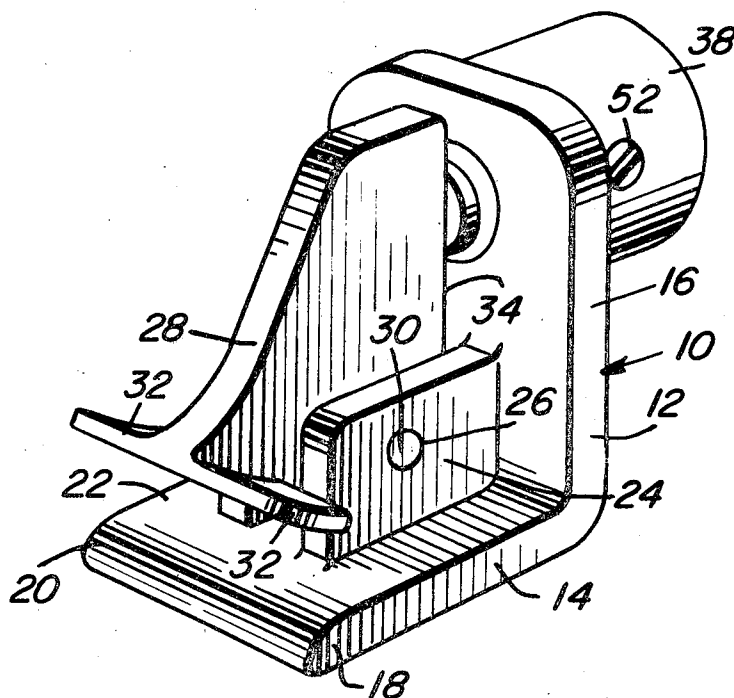
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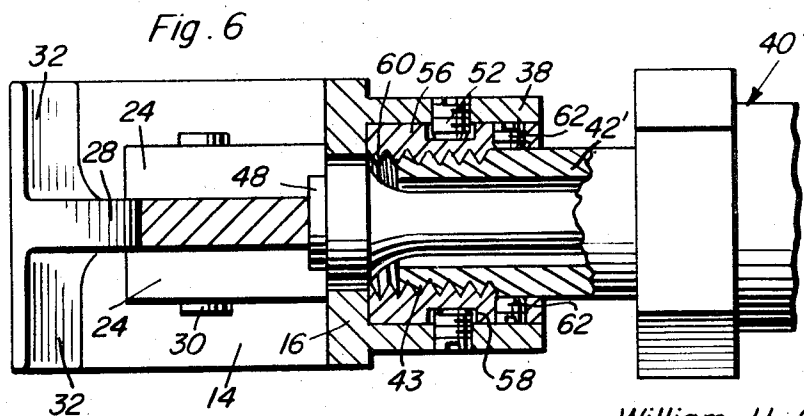
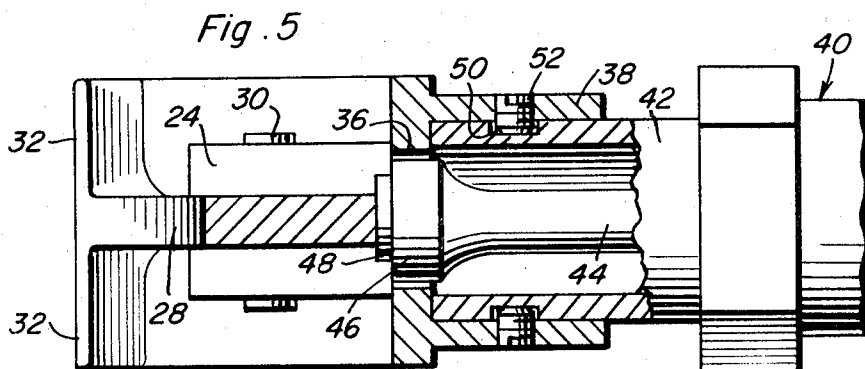
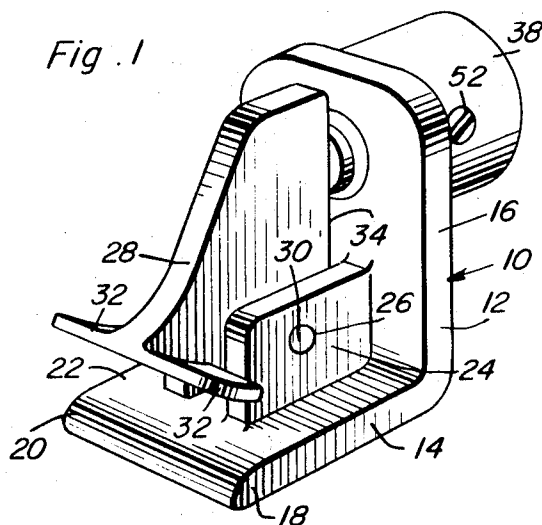
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[57] ABSTRACT

A support base defining a generally planar abutment surface and having an abutment member pivotally supported therefrom for oscillation relative to the base. The abutment member includes an arcuate surface extending about the axis of oscillation of the abutment member and including adjacent longitudinally spaced portions spaced progressively further from the axis of oscillation of the abutment member and progressively moveable into closer proximity with the abutment surface of the base in response to pivotal movement of the abutment member in one direction so that a clamping or crimping force may be directed upon a workpiece disposed between the abutment member's arcuate surface and the abutment surface of the base when the base is supported from the housing of an impact gun having its reciprocal impact member disposed for engagement with the abutment member.

7 Claims, 6 Drawing Figures

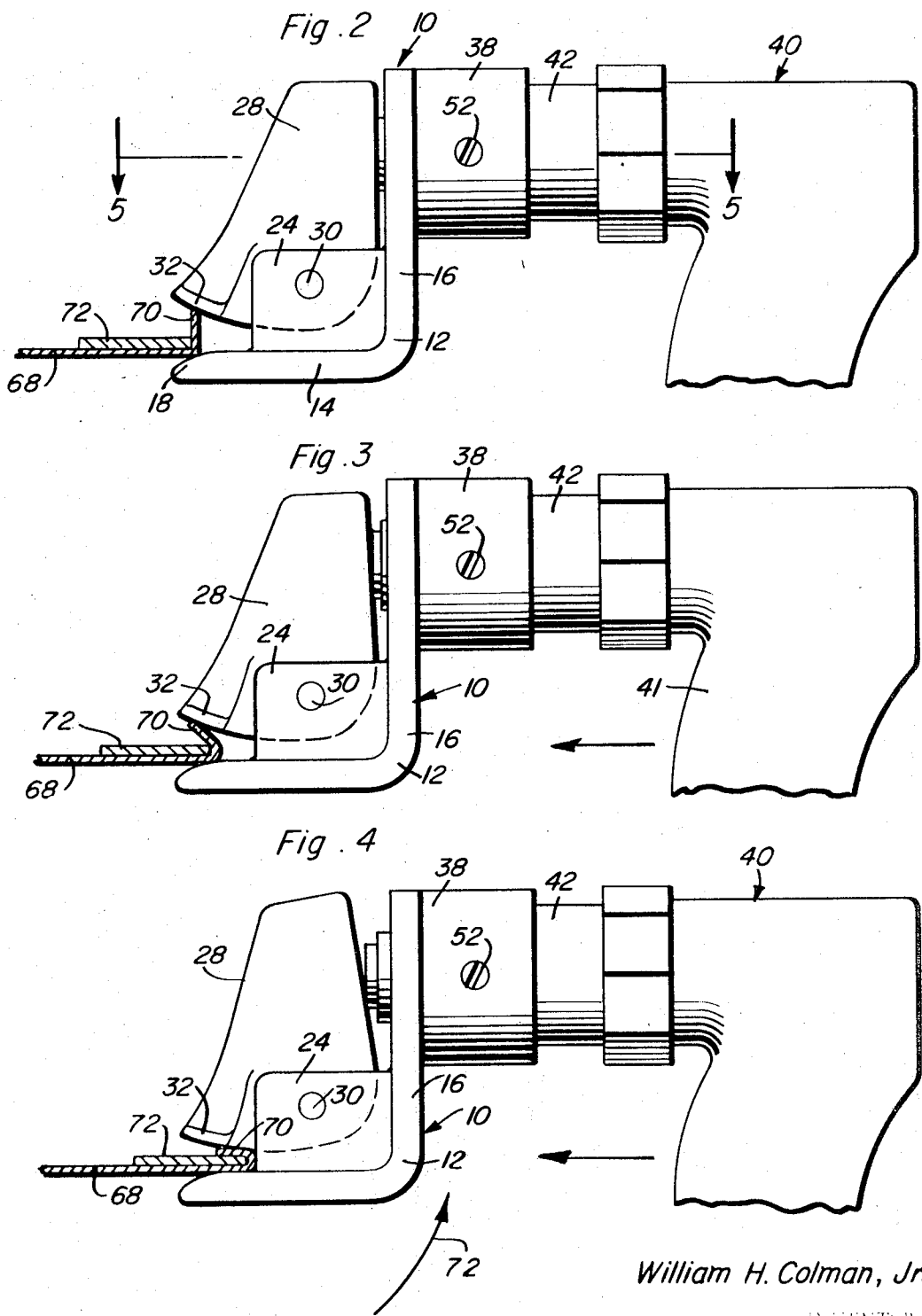




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SHEET METAL CRIMPING ATTACHMENT FOR IMPACT GUN

The attachment of the instant invention has been specifically designed for use in conjunction with an impact gun of the type utilized in body and fender repair work and includes a mounting portion specifically designed for support from the housing of an associated impact gun. With the attachment applied to an impact gun, the attachment may be utilized to crimp the edges of a replacement body panel over adjacent marginal portions of a vehicle body member to which the replacement panel is being secured.

In many instances vehicle body damage is repaired by cutting a damaged section of a body panel from the vehicle and applying a repair panel section over the damaged area. As an example, some vehicle doors are provided with horizontal trim strips spaced intermediate the upper and lower marginal portions of the door. If a lower portion of the outer body panel of the door is damaged and the damaged area is confined to the zone below such a horizontal trim strip, the lower damaged portion of the outer door panel may be removed by cutting the panel in the area disposed beneath the trim strip after the latter has been removed. Then, a repair panel section may be applied to the lower portion of the door and secured to the remaining original portion of the outer door panel along a line which will be covered by the trim strip when it is reapplied to the door.

When this type of body repair is carried out, the repair panel section has its edge portions initially crimped over the corresponding marginal edges of the door and thereafter the crimped marginal portions of the repair panel are spot welded to the door.

The attachment of the instant invention has been specifically designed to perform the aforementioned crimping action of the replacement body panel section in order to secure the latter over the area of the damaged door from which the damaged body panel section has been removed.

It is accordingly the main object of this invention to provide an attachment for an impact gun that will be operable to efficiently crimp the marginal edges of a body repair panel over the corresponding marginal portions of an associated body section.

Another object of this invention is to provide a crimping attachment constructed in a manner whereby it may be readily supported from and actuated by conventional impact guns utilized in conjunction with body repair work.

Still another object of this invention is to provide a crimping 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:

FIG. 1 is a perspective view of the crimping attachment;

FIG. 2 is a side elevational view of the crimping attachment as applied to an impact gun and with the crimping attachment positioned relative to a repair body panel section just prior to crimping one marginal edge portion of the repair body panel section;

FIG. 3 is a side elevational view similar to FIG. 2 illustrating the manner in which the attachment is utilized to crimp the repair body panel;

FIG. 4 is a side elevational view similar to FIGS. 2 and 3 but with the crimping attachment positioned to complete a repair panel crimping operation;

FIG. 5 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 5—5 of FIG. 2; and,

FIG. 6 is a fragmentary horizontal sectional view similar to FIG. 5 but illustrating a slightly modified form of attachment as applied to a slightly modified form of impact gun.

Referring now more specifically to the drawings the numeral 10 generally designates the sheet metal crimping attachment of the instant invention. The attachment 10 defines a body or base 12 including a generally horizontal base flange 14 terminating at its rear edge portion in an upwardly directed upstanding mounting flange 16. The forward edge portion 18 of the base flange 14 is radiused as at 20 and the upper surface 22 of the base flange 14 defines an abutment surface.

A pair of parallel upstanding mounting and bracing plates 24 are secured to the front surface of the mounting flange 16 and the upper surface 22 the base flange 14 and thereby brace the flanges 14 and 16 relative to each other. In addition, the plates 24 are provided with registered horizontal transverse bores 26 and an abutment member 28 is pivotally supported between the plates 24 by means of a pivot pin 30 secured through the abutment member 28 and the bores 26.

The abutment member 28 includes a pair of opposite side outwardly projecting horizontal and slightly arcuate flanges 32 which oppose the upper surface 22 and the rear portion of the abutment member 28 includes an upstanding edge 34 while the mounting flange 16 has a bore 36 formed therethrough and includes a rearwardly projecting mounting sleeve 38 concentric with the bore 36.

Any conventional form of impact gun is referred to in general by the reference numeral 40 and includes a forward sleeve portion 42 through which an impact piston or member 44 is reciprocal. The forward end of the impact member 44 includes a head 46 for guided reciprocation in the bore 36 and the forward face of the head 46 includes an impact element 48 disposed for impact with the edge 34 of the abutment member 28.

The sleeve portion 42 is provided with an external circumferentially extending groove 50 and the mounting sleeve 38 includes a pair of diametric set screws 52 whose inner ends project into the groove 50 and thereby support the attachment 10 for rotation relative to the sleeve portion 42 but against axial shifting relative to the sleeve portion 42.

With attention now invited more specifically to FIG. 6 of the drawings, there may be seen a modified form of impact gun referred to in general by the reference numeral 40' and whose sleeve portion 42' is externally threaded as at 43. An adaptor sleeve 56 is provided and includes an outer circumferential groove 58 corresponding to the groove 50 and the adaptor sleeve 56 is therefor secured within the mounting sleeve 38 by means of the

set screws 52. The adaptor sleeve 56 is internally threaded as at 60 and is threaded onto the forward end of the sleeve portion 42'. In addition, the adaptor sleeve 56 includes a pair of diametrically opposite set screws 62 by which the adaptor sleeve 56 is secured against rotation relative to the sleeve portion 42'. Of course, different impact guns may include sleeve portions of different configurations corresponding to the sleeve portions 42 and 42' and suitable adaptor sleeves corresponding to the adaptor sleeve 56 may be utilized so as to adapt the mounting sleeve 38 for mounting on substantially any sleeve portion of an impact gun.

In operation, and with attention now invited more specifically to FIGS. 2 through 4 of the drawings, the numeral 68 designates a repair panel section including a right angled anchor flange 70 extending along one marginal edge of the panel section 68. In order to apply the repair panel section 68 to the vehicle body assembly 72, the anchor flange 70 is crimped over the corresponding edge portion of the assembly 72 in the manner progressively illustrated in FIGS. 2 through 4. The attachment 10 carried by the impact gun 40 is applied to the anchor flange 70 in the manner illustrated in FIG. 2 of the drawings. Then, a forward thrust is applied to the handle 41 of the gun 40 as the latter is actuated and impact of the impact member 44 with the abutment member 28 causes the latter to swing in a clockwise direction as viewed in FIGS. 3 and 4 of the drawings so as to progressively crimp the anchor flange 70 over the corresponding marginal edge of the assembly 72.

After the flange 70 has been almost completely crimped over the corresponding edge of the assembly 72, the gun 40 and attachment 10 are rotated slightly in the direction indicated by the arrow 72 in FIG. 4. In this manner, the anchor flange 70 is firmly seated against the reverse side of the corresponding marginal edge of the assembly 72 and may thereafter, if desired, be spot or tack welded to the assembly 72.

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.

What is claimed as new is as follows:

1. In combination, a base defining a first abutment surface having a first marginal edge, a cam abutment member supported from said base for oscillation about an axis generally paralleling said edge, spaced from said surface and spaced inwardly from said edge, said cam member including a second slightly arcuate convex abutment surface spaced from, opposing and generally paralleling said first abutment surface, curving about said axis and including portions spaced angularly therealong in one direction toward said edge spaced increasing distances from said axis, said base including a mounting portion spaced outwardly of said axis from

said base first abutment surface and having an opening formed therethrough extending generally normal to said axis and generally paralleling said first abutment surface, said cam member including a portion registered with one end of said opening for impact thereon by an impact member reciprocated through said opening.

2. The combination of claim 1 wherein said mounting portion comprises a mounting flange generally paralleling said marginal edge and projecting outwardly from said first abutment surface.

3. The combination of claim 2 wherein said base includes a pair of generally parallel plates secured between said flange and said first abutment surface adjacent to junction between said flange and said first abutment surface disposed generally normal to said marginal edge, said cam member being disposed between said plates and oscillatively supported therefrom.

4. The combination of claim 1 wherein the junction between said marginal edge and said first abutment surface is convexly radiused.

5. In combination, a base defining a first abutment surface having a first marginal edge, a cam abutment member supported from said base for oscillation about an axis generally paralleling said edge and spaced outwardly of said surface, said cam member including a second arcuate convex abutment surface curving about said axis with portions of said arcuate abutment surface spaced angularly therealong in one direction being spaced increasing distances from said axis, said base including a mounting portion spaced outwardly of said axis from said base first abutment surface and having an opening formed therethrough extending generally normal to said axis and generally paralleling said first abutment surface, said cam member including a portion registered with one end of said opening for impact thereon by an impact member reciprocated through said opening, said mounting portion comprising a mounting flange generally paralleling said marginal edge and projecting outwardly from said first abutment surface, said base including a pair of generally parallel plates secured between said flange and said first abutment surface adjacent to junction between said flange and said first abutment surface disposed generally normal to said marginal edge, said cam member being disposed between said plates and oscillatively supported therefrom, including a mounting sleeve secured to said flange about said opening and projecting outwardly of the side of said flange remote from said marginal edge, said mounting flange being adapted to be supported from the sleeve portion of an impact gun through which the impact member of the gun is reciprocal.

6. The combination of claim 5 including an adaptor sleeve rotatively supported within said mounting sleeve and including means adapted for stationary support from the sleeve portion of said impact gun.

7. The combination of claim 6 wherein the junction between said marginal edge and said first abutment surface is convexly radiused.

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