

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 December 2007 (13.12.2007)

PCT

(10) International Publication Number
WO 2007/143748 A2

(51) International Patent Classification: **Not classified**

(21) International Application Number:
PCT/US2007/070826

(22) International Filing Date: 11 June 2007 (11.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/812,281 9 June 2006 (09.06.2006) US
11/810,254 5 June 2007 (05.06.2007) US

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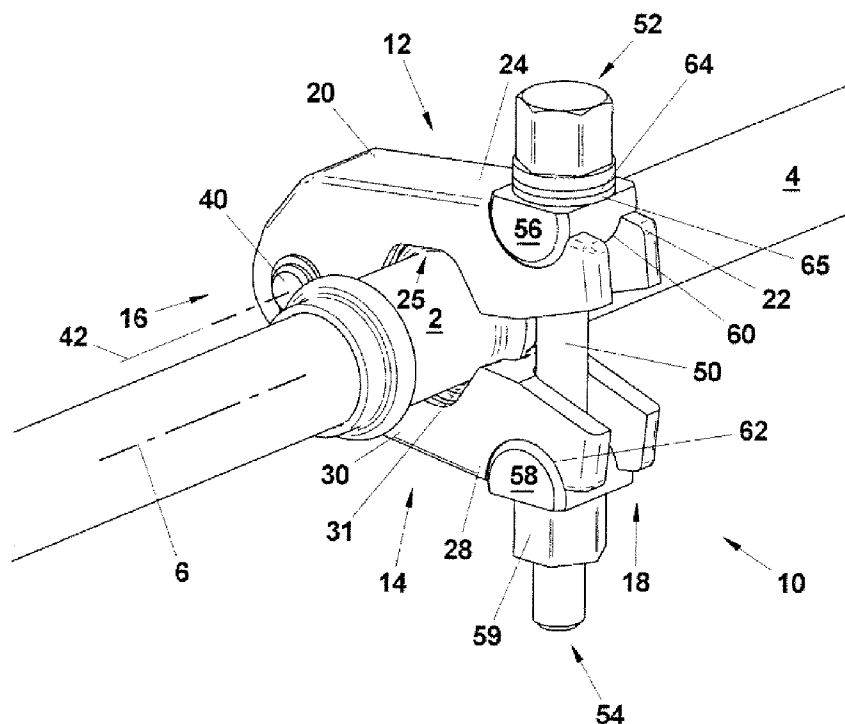
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: **MANUAL CRIMP / PRESS TOOL**



(57) Abstract: A crimp or press tool is provided that includes two pivotally connected jaw members that can be selectively drawn toward one another in order to crimp or otherwise press a fitting onto a pipe or other workpiece. The tool uses a tightening assembly that enables the application of oppositely directed rotational forces to thereby prevent or at least significantly reduce the potential for imparting undesirable torque moments into the pipe or workpiece.

WO 2007/143748 A2



Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

5 TITLE

[0001] MANUAL CRIMP / PRESS TOOL

CROSS REFERENCES TO RELATED APPLICATIONS

[0002] The present application claims priority of U.S. provisional application Serial
10 No. 60/812,281 filed on June 9, 2006. Application No. 60/812,281 is incorporated herein
by reference in its entirety.

BACKGROUND OF THE INVENTION

[0003] The present invention relates to manual tools for use with fittings, joints and
15 couplings for pipes and tubes and, more particularly, to a manual crimp/press tool for use
in applying fittings onto hollow tubes or pipes by pressing, crimping, or otherwise
swaging the fittings onto open ends of the tube. The tools of the present invention are
particularly useful and find application in connection with crimp/press fittings
commercially available from a variety of sources. However, it is to be appreciated that the
20 subject tools can be adapted for use with other types of fittings and in other applications
beyond the hollow tubes or pipes described herein without departing from the spirit and
scope of the description below.

[0004] One disadvantage of prior art manual crimp tools is that they impart
undesirable and sometimes destructive torque into the target system during use as the
25 fittings are connected onto the pipes or tubes of the system. These prior art tools utilize
upper and lower hinged jaw members having, on one end, a hinge member enabling
pivotal movement of the jaw members relative to each other and, on the other end, a bolt
or other form of threaded member adapted to rotate freely in one of the jaw members
while the other of the jaw members is drawn together by rotating the bolt member.
30 Typically, the bolt includes a nut head or the like adapted to provide an interface for
connecting with an associated tightening tool such as a wrench. As the wrench is used to
tighten the bolt, a torque force is imparted into the tool which is in turn transferred into the
target tube or pipe through the fitting. The workpiece itself thus provides the reactive
force opposite the applied force. The undesirable opposing torque moments tend to cock
35 the fitting relative to the tube and, ultimately, stress the tube at the work area. Obviously,
it is desirable for the fitting to be crimped onto the tube while in alignment therewith and,

5 thus, cocking is highly undesirable. In addition, stress imparted into the workpiece including the tube, pipe, and other components can cause other damage to the system.

[0005] Therefore, there is a need for a manual crimp/press tool for connecting fittings onto tubes or pipes without introducing unnecessary and undesirable torque moments into the workpieces.

10 [0006] In U.S. patent application publication No. US 2003/0230132, an embodiment of a crimping apparatus is depicted in Figures 23, 24A, and 24B that provides for the application of two opposing torques. The opposing torque forces are applied to the apparatus in such a manner that an undesirable torque moment or other stress is avoided and not introduced into the workpiece. Although this embodiment offers a significant
15 advance in the art, still further improvements would be beneficial.

SUMMARY

[0007] In a first aspect, the present invention provides a manual crimp or press tool comprising a first jaw member having a hinge region, a tightening region, and a pressing
20 surface extending therebetween. The first jaw member includes in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defines a receiving slot between the first and second projections. The first jaw member defines in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the first jaw member. The receiving slot is accessible along a distal
25 end of the first jaw member and at the concave arcuate surface. The tool also comprises a second jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween. The second jaw member is pivotally attached at the hinge region of the second jaw member, to the hinge region of the first jaw member. The first and second jaw members are oriented such that the pressing surface of the first jaw member
30 faces the pressing surface of the second jaw member. The tool also comprises a trunion defining an outer surface that includes a partially cylindrical region and an aperture extending through the trunion and accessible at the cylindrical region. The trunion is disposed in the concave arcuate surface defined in the first jaw member. The tool also comprises a tightening assembly including (i) an elongate threaded tightening member
35 disposed within the receiving slot defined in the first jaw member. The tightening member extends through the aperture defined in the trunion. The tightening assembly also includes

- 5 (ii) a threaded engagement member threadedly engaging the tightening member along the tightening region of the second jaw member.

[0008] In another aspect, the present invention provides a manual crimp or press tool comprising a first jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween. The first jaw member includes in the tightening region, a
10 first projection, a second projection spaced from and parallel to the first projection and defines a receiving slot between the first and second projections. The first jaw member defines in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the first jaw member. The receiving slot is accessible along a distal end of the first jaw member and at the concave arcuate surface. The tool also comprises a
15 second jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween. The second jaw member includes in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defines a receiving slot between the first and second projections. The second jaw member defines in the tightening region, a concave arcuate surface oppositely directed from the pressing
20 surface of the second jaw member. The receiving slot is accessible along a distal end of the second jaw member and at the concave arcuate surface of the second jaw member. The second jaw member is pivotally attached at the hinge region of the second jaw member to the hinge region of the first jaw member. The first and second jaw members are oriented such that the pressing surface of the first jaw member faces the pressing
25 surface of the second jaw member. The tool also comprises a first trunion defining an outer surface that includes a partially cylindrical region and an aperture extending through the first trunion and accessible at the cylindrical region. The first trunion is disposed in the concave arcuate surface defined in the first jaw member. The tool also comprises a second trunion defining an outer surface that includes a partially cylindrical region and a
30 threaded aperture extending through the trunion and accessible at the cylindrical region. The second trunion is disposed in the concave arcuate surface defined in the second jaw member. The tool also comprises an elongate threaded tightening member disposed within the receiving slot defined in the first jaw member and also disposed within the receiving slot defined in the second jaw member. The tightening member extends through
35 the aperture defined in the first trunion and threadedly engaged with the threaded aperture of the second trunion.

5 [0009] In yet another aspect, the present invention provides a manual crimp or press tool comprising a first jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween. The first jaw member includes in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defines a receiving slot between the first and second projections. The
10 receiving slot is accessible along a distal end of the first jaw member. The tool further comprises a second jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween. The second jaw member includes in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defines a receiving slot between the first and second projections. The
15 second jaw defines an aperture extending through both the first and second projections. The aperture is accessible from the receiving slot of the second jaw member. The receiving slot is accessible along a distal end of the second jaw member. The second jaw member is pivotally attached at the hinge region of the second jaw member, to the hinge region of the first jaw member. The first and second jaw members are oriented such that
20 the pressing surface of the first jaw member faces the pressing surface of the second jaw member. The tool also comprises a trunion defining an aperture extending through the trunion. The trunion is disposed along the tightening region of the first jaw member. The tool also comprises a pin member rotatably disposed in the aperture defined in the first and second projections of the second jaw member. The pin member defines a threaded
25 aperture extending through the pin member and in a direction generally transverse to the aperture defined in the second jaw member extending through both the first and second projections. The tool also comprises an elongate threaded tightening member disposed within the receiving slot defined in the first jaw member and also disposed within the receiving slot defined in the second jaw member. The tightening member extends through
30 the aperture defined in the trunion and is threadedly engaged with the aperture defined in the pin member disposed in the second jaw member.

BRIEF DESCRIPTION OF THE DRAWINGS

35 [0010] FIGURE 1 is a perspective view of a first preferred embodiment manual crimp/press tool in accordance with the present invention illustrated together with an associated workpiece set.

5 [0011] FIGURE 2 is an exploded view of the first preferred embodiment manual crimp/press tool depicted in FIGURE 1.

[0012] FIGURE 3 is a perspective view of the tool of FIGURE 1 illustrated together with associated other standard tools showing a preferred use of the subject tool.

10 [0013] FIGURE 4 is a perspective view of a second preferred embodiment manual crimp/press tool in accordance with the present invention.

[0014] FIGURE 5 is an exploded view of the second preferred embodiment manual crimp/press tool depicted in FIGURE 4.

DETAILED DESCRIPTION

15 [0015] With reference first to FIGURES 1 and 2, the first preferred embodiment tool 10 includes upper and lower jaw members 12, 14 pivotally connected on one end at a hinge region 16 and adapted to be drawn together at a tightening region 18. The upper jaw member 12 is preferably of a unitary construction and includes a hinge portion 20, a force receiving portion 22, and a force transmitting portion 24 extending therebetween. 20 Similarly, the lower jaw 14 includes a hinge portion 26, a force receiving portion 28, and a force transmitting portion 30 extending therebetween. The jaws and other components of the preferred embodiment tool are preferably made from hardened steel although other materials can be used as desired. Alternately, in a more economical version of the tool, one or more of the jaw members could be cast to further reduce costs.

25 [0016] As will be appreciated by those skilled in the art, each of the force transmitting portions 24, 30 of the upper and lower jaw members 12, 14 defines a concave arcuate pressing surface 25, 31 adapted to engage a portion of the associated fitting 2 for pressing the fitting 2 onto the associated tube or pipe 4. The upper jaw 12 defines an upper face or upwardly directed outer face, and an oppositely directed lower face. The lower face 30 includes the concave arcuate pressing surface. Similarly, the lower jaw 14 defines a lower face or downwardly directed outer face, and an oppositely directed upper face. The upper face includes the concave arcuate pressing surface. Preferably, the respective pressing surfaces 25, 31 face each other. In particular, the pressing surfaces 25, 31 have a profile of the type used in the art for crimping fittings used to join pipe and tubing in a variety of 35 applications and sizes. Accordingly, no further detailed description of the surfaces are necessary.

5 [0017] With continued reference to FIGURES 1 and 2, the tool 10 includes a transverse pin member 40 extending through the hinge portions 20, 26 of each of the upper and lower jaw members 12, 14 substantially as shown. Specifically, the pin member 40 extends through an aperture 21 defined in the upper jaw member 12 and also through an aperture 23 defined in the lower jaw member 14. In that way, the upper and lower jaw
10 members are selectively pivotable relative to each other about an axis 42 defined by the pin member 40. As shown in the referenced figures, the axis 42 defined by the pin member 40 is substantially parallel with the axis 6 of the workpiece tube 4. In that way, when the subject tool 10 is placed onto the workpiece fitting and tube 2, 4, the upper and lower jaw members 12, 14 are pivotally movable in a plane 44 (FIGURE 3) which is
15 substantially perpendicular to each of the axes 42, 6 defined by the pin member 40 and tube workpiece 4, respectively.

[0018] The tightening region 18 of the assembled subject tool 10 includes an elongate threaded tightening member 50 having a bolt head 52 on one end thereof and a threaded
20 end 54 opposite from the bolt head. As is clear from the drawing figures, the threaded member 50 extends through each of the upper and lower jaw members 12, 14 through their respective force receiving portions 22, 28, respectively. The force receiving portion 22 of the upper jaw member 12 includes an arcuate surface 60 adapted to receive a trunion member 56 that carries the upper end of the threaded tightening member 50. Similarly, the force receiving portion 28 of the lower jaw member 14 defines a lower arcuate surface 62
25 adapted to receive a portion of a lower trunion member 58 carried on the lower end of the threaded tightening member 50. At least one and preferably both of the trunions 56 and 58 are at least partially cylindrical in shape and so, define an arcuate outer surface. The diameter and shape of the outer surface of the trunions are such that the respective trunion can be positioned in intimate contact with the corresponding arcuate surface 60, 62
30 defined by each respective jaw member 12, 14.

[0019] It is to be appreciated that the upper trunion member 56 defines an opening 55 that is preferably not threaded yet large enough to loosely receive the threaded tightening member 50 therethrough. The lower trunion member 58 defines an opening 57 that is internally threaded for mated threaded engagement with the tightening member 50. The
35 lower trunion member 58 preferably includes an integral hex head 59. As the threaded tightening member 50 is tightened, the lower trunion member 58 is drawn toward the

5 upper trunion member 56 thus imparting a force into the force receiving portions 22, 28 of the upper and lower jaw members 12, 14, respectively. The force received into the jaw members is in turn amplified into the workpiece fitting 2 by the force transmitting portions 24, 30 of the upper and lower jaw members as they pivot about the pin member 40. As illustrated in the drawing figures, a friction reducing thrust washer 65 is preferably
10 provided at the underside of the bolt head 52 for added tool life and to minimize unnecessary friction and wear between the bolt head 52 and the upper portion of the trunion member 56. Another benefit provided by the friction reducing thrust washer 65 is a reduction in the amount of force required by an end user to tighten the threaded member 50 and in turn close the jaw members 12, 14 to compress the fitting 2 onto the workpiece
15 tube 4. Specifically, the amount of active torque imparted into the bolt head 52 and the amount of reactive torque required at the hex head 59 needed to overcome friction between the components is minimized by use of the washer 65. As described in greater detail herein, an optional second washer 64 can be utilized between the washer 65 and the bolt. This washer would create a smooth surface for the friction reducing washer to ride
20 against in the event that the underside of the bolt head is not smooth (if the bolt is turned from bar stock, it is possible that the surface finish may not be smooth enough.) In the event that the underside of the bolt head is not smooth, the plain washer will reduce friction between both surfaces and wear of the mating friction reducing washer.

[0020] FIGURE 2 illustrates a significant feature of the preferred embodiment tool.
25 Preferably, both of the upper jaw 12 and the lower jaw 14 include a forked region adapted for receiving the tightening member 50 and a respective trunion, i.e. either the upper trunion 56 or the lower trunion 58. That is, the upper jaw member 12 includes a first outwardly extending projection 7, and a second outwardly extending projection 8, generally spaced from and parallel to the first projection 7 and thereby defining a
30 receiving slot 9. As shown in the drawings, the receiving slot 9 is accessible along a distal end of the upper jaw 12. As shown in FIGURE 2, preferably, the arcuate surface 60 defined along the upper surface of the jaw member 12 extends along and includes or constitutes the upper surfaces of the first and second projections 7 and 8. This unique configuration provided by the upper jaw member 12 facilitates easy positioning and
35 placement of the trunion 56 within the arcuate surface 60 and engagement with the tightening member 50.

5 [0021] Similarly, the lower jaw member 14 includes a first outwardly extending projection 32, and a second outwardly extending projection 33, generally spaced from and parallel to the first projection 32 and thereby defining a receiving slot 34. The receiving slot 34 is accessible along a distal end of the lower jaw member 14. As shown in FIGURE 2, preferably, the arcuate surface 62 defined along the lower surface of the jaw member 14
10 extends along and includes or constitutes the lower surfaces of the first and second projections 32 and 33. This unique configuration provided by the lower jaw member 14 facilitates easy positioning and placement of the trunion 58 within the arcuate surface 62 and engagement with the tightening member 50.

[0022] FIGURE 3 shows the subject tool 10 during use while crimping a fitting 2 onto
15 an associated tube 4 using first and second associated wrench tools 70, 72. The subject tool 10 is preferably used by placing it onto the target workpiece and then, through use of the first and second wrench tools 70, 72, while holding the lower hex head 59 of the trunion 58 stationary, tightening the upper trunion member 56 such as illustrated in the figure by arrow A. The hex head clamping surface 59 is preferably an integral hex head
20 formed on the lower trunion member 58 to enable the lower trunion member 58 and, thus, lower jaw member 14 to be held stationary relative to the fitting 2 and workpiece tube 4 while the upper trunion member 56 is tightened using the first wrench tool 70 applied to the bolt head 52 of the threaded tightening member 50. More particularly, the hex head 59 and integral trunion 58 provide a means for applying a counter-rotating torque as shown
25 by arrow B, while tightening the upper bolt head 52 with the wrench tool 70 in the direction of arrow A. The use of an integral lower trunion 58 and head 59 increases the amount of control the user has over the tool 10. Furthermore, an integral trunion 58 and head 59 reduces the amount of undesirable torque otherwise transmitted to the workpiece.

[0023] Preferably, by holding the clamping surface 59 stationary, both of the upper
30 and lower jaw members 12, 14 are held stationary and substantially within the plane 44 defined by the jaw members as described above. The plane 44 is perpendicular to the axes 42, 6 defined by the pin member 40 and tube 4, respectively. In that way, virtually none of the torque exerted between the first and second wrench tools 70, 72 is imparted into the system comprising the tool 10, the fitting 2, and the tube 4. Rather, all of the force is used
35 productively for crimping the fitting onto the tube. Thus, the undesirable effects of the cocking of the fitting 2 relative to the tube as well as the effects of the strain developed in

5 the tube such as found in the prior art caused by torque induced tightening, is avoided in the tool 10 of the present invention.

[0024] It is to be appreciated that other equivalent surfaces and configurations can be used as well for providing a connection between the second associated wrench 72 and the tightening region 18 of the subject tool 10. One example is to provide a hex shape on the
10 lower jaw itself. Other means such as a designated clamping surface as shown in FIGURES 4 and 5 are possible as well. To that end, FIGURES 4 and 5 show a tool 10' in accordance with a second preferred embodiment of the invention. In the description to follow, like parts having similar function are designated with a prime (" ' ") suffix.

[0025] The tool 10' in accordance with the second preferred embodiment, includes
15 upper and lower jaw members 12', 14' pivotally connected on one end at a hinge region 16' and adapted to be drawn together at a tightening region 18'. The upper jaw member 12' is preferably of a unitary construction and includes a hinge portion 20', a force receiving portion 22', and a force transmitting portion 24'. Similarly, the lower jaw 14' includes a hinge portion 26', a force receiving portion 28', and a force transmitting portion 30'. The
20 jaws and other components of the subject tool are preferably made from hardened steel although other materials can be used as desired.

[0026] As will be appreciated by those skilled in the art, each of the force transmitting portions 24', 30' of the upper and lower jaw members 12', 14' defines a concave arcuate pressing surface 25', 31' adapted to engage a portion of the associated fitting (not shown)
25 for pressing the fitting onto an associated tube, pipe, or other item (not shown). In particular, as with the first embodiment of the subject tool described above, the pressing surfaces 25', 31' have a profile of the type used in the art for crimping fittings used to join pipe and tubing in a variety of applications and in standard and non-standard sizes. Accordingly, no further detailed description of the surfaces are necessary.

[0027] With continued reference to FIGURES 4 and 5, the tool 10' includes a transverse pin member 40' extending through the hinge portions 20', 26' of each of the upper and lower jaw members 12', 14', substantially as shown. Specifically, the pin member 40' extends through an aperture 21' defined in the upper jaw member 12' and also through an aperture 23' defined in the lower jaw member 14'. In that way, the upper
30 and lower jaw members are selectively pivotable relative to each other about an axis 42' defined by the pin member 40'. As shown in the figures, the axis 42' defined by the pin
35

5 member 40' is substantially parallel with an axis 6' extending along the length of the associated workpiece (not shown) when received into a position between the upper and lower jaw members. In that way, when the subject tool 10' is placed onto the workpiece fitting and tube members, the upper and lower jaw members 12', 14' are pivotally movable in a plane which is substantially perpendicular to each of the axes 42', 6' defined by the pin
10 member 40' and the tube or associated workpiece.

[0028] The tightening region 18' of the subject tool 10' includes an elongate threaded member 50' having a bolt head 52' on one end thereof and a tapered end 54' opposite from the bolt head. As is clear from the drawing figures, the threaded member 50' extends through each of the upper and lower jaw members 12', 14' through their respective force
15 receiving portions 22', 28', respectively. The force receiving portion 22' of the upper jaw member 12' includes an arcuate surface 60' adapted to receive a trunion member 56' that carries the upper end of the threaded tightening member 50'. The upper trunion member 56' defines an opening 55' that is preferably not threaded, yet large enough to loosely receive the threaded tightening member 50' therethrough. A friction-reducing thrust
20 washer 64' can be utilized between the underside of the bolt head 52' and the outer surface of the trunion member 56'. The force receiving portion 28' of the lower jaw member 14' defines a fork region 80 including a pair of spaced apart connection tab members 82, 84 defining a gap 86 therebetween. Each of the connection tab members 82, 84 define circular openings 90, 92 aligned with one another and adapted to receive a substantially
25 cylindrical pin member 66 extending parallel to the axes 6', 42' described above. In its preferred form, the pin member 66 defines a threaded aperture 67 and is adapted to threadedly receive the threaded tightening member 50' and, further, is adapted to rotate within the circular openings 90, 92. The threaded aperture 67 extends through the pin member 66. And, upon incorporation of the pin member 66 in the circular openings 90, 92
30 defined in the lower jaw member 14', the aperture 67 is oriented such that its axis is transverse to that of the pin member 40'.

[0029] FIGURE 5 illustrates a significant feature of the preferred embodiment tool 10'. Preferably, the upper jaw 12' includes a forked region adapted for receiving the tightening member 50' and a trunion, i.e. the upper trunion 56'. That is, the upper jaw
35 member 12' includes a first outwardly extending projection 7', and a second outwardly extending projection 8', generally spaced from and parallel to the first projection 7' and

5 thereby defining a receiving slot 9'. The receiving slot 9' is accessible along a distal end of the upper jaw 12'. As shown in FIGURE 5, preferably, the arcuate surface 60' defined along the upper surface of the jaw member 12' extends along and includes or constitutes the upper surfaces of the first and second projections 7' and 8'. This unique configuration provided by the upper jaw member 12' facilitates easy positioning and placement of the
10 trunion 56' within the arcuate surface 60' and engagement with the tightening member 50'. The lower fork region 80 of the lower jaw member 14' also features a slot or receiving channel, i.e. the gap 86 that is adapted to receive the tightening member 50' when positioned between the connection tab members 82 and 84.

[0030] In addition to the above, each of the connection tab members 82, 84 defines flat
15 interface surfaces 102, 104 for connection with an associated tightening tool such as an open end wrench, an adjustable spanner or adjustable wrench, or the like. The first connection tab member 82 includes spaced apart upper and lower guide members 106, 108 useful in assisting locating the associated tightening wrench (not shown) relative to the interface surface 102. Similarly, the second connection tab member 84 includes spaced
20 apart upper and lower guide members 110, 112 useful in aligning and guiding an associated wrench relative to the flat interface surface 104.

[0031] Of particular relevance to the second preferred embodiment tool, as with the first embodiment tool 10', the tool 10' shown in FIGURES 4 and 5 helps resist twisting forces imparting into the workpiece while the bolt head 52' is tightened relative to the
25 transverse pin member 66 and tool body components. The fork region 80 is adapted to receive an associated wrench or other tool onto the interface surfaces 102, 104 for purposes of providing a reactive torque against the clamping torque force exerted by a tightening tool 70 such as shown in FIGURE 3 exerted onto the bolt head 52'. The tool 10' of the second embodiment is preferably used by placing it onto the target workpiece and
30 then, through use of first and second wrench tools (not shown), tightening the upper bolt head 52' in a clockwise rotation while holding the lower fork region 80 stationary. Again, the lower tool (not shown) attached with the fork region 80 provides a counter torque against the tightening tool (not shown) applied to the elongate bolt head 52'.

[0032] Preferably, by holding the clamping surfaces 102, 104 stationary, both of the
35 upper and lower jaw members 12', 14' are held stationary and substantially within a plane defined by the jaw members in a manner similar to the plane 44 in FIGURE 3 as described

5 above. The plane (not shown in FIGURE 4) is perpendicular to the axes 42', 6' defined by the pin member 40' and tube (not shown), respectively. In that way, virtually none of the torque exerted between the first and second wrench tools (not shown) is imparted into the system comprising the tool 10', the fitting and the tube. Rather, all of the force is used productively for crimping the fitting onto the tube. Thus, the undesirable effects of the
10 cocking of the fitting relative to the tube as well as the effects of the strain developed in the tube such as found in the prior art caused by torque induced tightening, is avoided in the tool 10' of the present invention.

[0033] The friction reducing washer, e.g. the thrust washer 65 and 65', is preferably coated with a friction reducing material such as Teflon. In certain embodiments, it is
15 preferred to only coat the top face of the washer 65 or 65' with the friction reducing coating, as that is the face of the washer that contacts the underside of the bolt head 52 or 52'. Optionally, a second washer, e.g. 64, 64', can also be utilized in the fastener assembly. Preferably, the second washer is positioned between the underside of the bolt head and friction reducing washer.

20 [0034] It is also preferred, that a biasing member 120, 120' be utilized in the tools 10, 10' such that the upper and lower jaws are urged toward one another. Preferably, the biasing member 120, 120' is in the form of a coiled torsional spring and can be incorporated about the pin member 40, 40' which serves as a hinge or pivot for the two jaw members. A retaining member 125, 125' is preferably used, which engages a
25 circumferential receiving depression defined along the outer surface of the pin 40, 40'.

[0035] With reference to FIGURES 1-2 and 4-5, it is to be appreciated that, preferably, each of the bolt head 52 as well as the hex head 59 have a tall aspect ratio of height to width relative to the equivalent industry standard sized heads. In the preferred
30 embodiments shown in the drawings, the extra tall bolt head 52 and extra tall integral hex head 59 of the first embodiment, and of the extra tall head bolt 52' of the second embodiment (FIGURE 3) are provided to increase engagement and control by the user when applying torque forces into the threaded tightening member 50.

[0036] The fastening member, e.g. 50, 50', and specifically the threaded region thereof, and corresponding threaded aperture regions described herein, preferably utilizes
35 an ACME screw thread. As known by those skilled in the art, ACME threads are

5 generally symmetrical V-profile threads. ACME threads are generally stronger than other symmetrical V-profile threads.

[0037] The present invention also includes a variation of either of the tools 10, 10' in which the upper trunion 56, 56' is loosely retained with the upper jaw member 12, 12'. This version is desirable in that it would preclude losing or otherwise misplacing the upper
10 trunion 56, 56' if that component were separated from the tool 10, 10'.

[0038] The foregoing description is, at present, considered to be the preferred embodiments of the present invention. However, it is contemplated that various changes and modifications apparent to those skilled in the art, may be made without departing from the present invention. Therefore, the foregoing description is intended to cover all such
15 changes and modifications encompassed within the spirit and scope of the present invention, including all equivalent aspects.

5 CLAIMS:

1. A manual crimp or press tool comprising:

a first jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween, the first jaw member including in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and
10 defining a receiving slot between the first and second projections, the first jaw member defining in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the first jaw member, the receiving slot accessible along a distal end of the first jaw member, and at the concave arcuate surface;

a second jaw member having a hinge region, a tightening region, and a pressing
15 surface extending therebetween, the second jaw member pivotally attached at the hinge region of the second jaw member, to the hinge region of the first jaw member, the first and second jaw members oriented such that the pressing surface of the first jaw member faces the pressing surface of the second jaw member;

a trunion defining an outer surface that includes a partially cylindrical region and
20 an aperture extending through the trunion and accessible at the cylindrical region, the trunion disposed in the concave arcuate surface defined in the first jaw member; and

a tightening assembly including (i) an elongate threaded tightening member disposed within the receiving slot defined in the first jaw member, the tightening member extending through the aperture defined in the trunion, and (ii) a threaded engagement
25 member threadedly engaging the tightening member along the tightening region of the second jaw member.

2. The tool of claim 1 wherein the elongate threaded tightening member includes a bolt head defined at one end, and the threaded tightening member positioned relative to the first jaw member such that the trunion disposed in the concave arcuate
30 surface defined in the first jaw member is positioned between the bolt head and the first jaw member.

3. The tool of claim 2 further comprising:

a friction reducing washer disposed between the bolt head and the trunion.

4. The tool of claim 1 wherein the second jaw member defines in the
35 tightening region, a concave arcuate surface oppositely directed from the pressing surface of the second jaw member, the threaded engagement member is in the form of a second

5 trunion, the second trunion defining an outer surface that includes a partially cylindrical region, the second trunion disposed in the concave arcuate surface of the second jaw member.

5. The tool of claim 1 wherein the aperture defined in the trunion is free from threads and is sized and adapted to loosely receive the elongate threaded tightening
10 member extending therethrough.

6. The tool of claim 1 wherein the second jaw includes, in the tightening region of the second jaw, a first projection and a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections.

15 7. The tool of claim 6 wherein the second jaw member defines in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the second jaw member, the receiving slot defined in the second jaw member accessible along a distal end of the second jaw member, and at the concave arcuate surface defined in the second jaw member.

20 8. The tool of claim 7, wherein the threaded engagement member is in the form of a second trunion, the second trunion defining an outer surface that includes a partially cylindrical region, the second trunion disposed in the concave arcuate surface of the second jaw member such that at least a portion of the cylindrical region of the second trunion contacts the arcuate surface of the second jaw member.

25 9. The tool of claim 1 wherein the second jaw includes a first projection, a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections, the second jaw defining an aperture extending through both the first and second projections, the aperture accessible from the receiving slot, the receiving slot accessible along a distal end of the second jaw member,
30 and the threaded engagement member being in the form of a pin member defining a threaded aperture extending through the pin member, the pin member disposed in the aperture defined in the first and second projections of the second jaw member and oriented in the first and second projections such that the elongate threaded tightening member extends within and through the aperture defined in the pin member and is threadably
35 engaged with the pin member.

5 10. A manual crimp or press tool comprising:

 a first jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween, the first jaw member including in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections, the first jaw member
10 defining in the tightening region a concave arcuate surface oppositely directed from the pressing surface of the first jaw member, the receiving slot accessible along a distal end of the first jaw member and at the concave arcuate surface;

 a second jaw member having a hinge region, a tightening region, and a pressing surface extending therebetween, the second jaw member including in the tightening
15 region, a first projection, a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections, the second jaw member defining in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the second jaw member, the receiving slot accessible along a distal end of the second jaw member and at the concave arcuate surface of the
20 second jaw member, the second jaw member pivotally attached at the hinge region of the second jaw member, to the hinge region of the first jaw member, the first and second jaw members oriented such that the pressing surface of the first jaw member faces the pressing surface of the second jaw member;

 a first trunion defining an outer surface that includes a partially cylindrical region
25 and an aperture extending through the first trunion and accessible at the cylindrical region, the first trunion disposed in the concave arcuate surface defined in the first jaw member;

 a second trunion defining an outer surface that includes a partially cylindrical region and a threaded aperture extending through the trunion and accessible at the cylindrical region, the second trunion disposed in the concave arcuate surface defined in
30 the second jaw member; and

 an elongate threaded tightening member disposed within the receiving slot defined in the first jaw member and also disposed within the receiving slot defined in the second jaw member, the tightening member extending through the aperture defined in the first trunion and threadedly engaged with the threaded aperture of the second trunion.

35

5 11. The tool of claim 10 wherein the second trunion includes an integral hexagonal region adapted for engagement by a wrench or socket.

 12. The tool of claim 10 wherein the elongate threaded tightening member includes a bolt head defined at one end, and the threaded tightening member positioned relative to the first jaw member such that the bolt head is proximate to the first trunion
10 disposed in the concave arcuate surface defined in the first jaw member.

 13. The tool of claim 12 further comprising:
a friction reducing washer disposed between the bolt head and the first trunion.

 14. A manual crimp or press tool comprising:
a first jaw member having a hinge region, a tightening region, and a pressing
15 surface extending therebetween, the first jaw member including in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections, the receiving slot accessible along a distal end of the first jaw member;

a second jaw member having a hinge region, a tightening region, and a pressing
20 surface extending therebetween, the second jaw member including in the tightening region, a first projection, a second projection spaced from and parallel to the first projection and defining a receiving slot between the first and second projections, the second jaw defining an aperture extending through both the first and second projections, the aperture accessible from the receiving slot of the second jaw member, the receiving
25 slot accessible along a distal end of the second jaw member, the second jaw member pivotally attached at the hinge region of the second jaw member, to the hinge region of the first jaw member, the first and second jaw members oriented such that the pressing surface of the first jaw member faces the pressing surface of the second jaw member;

a trunion defining an aperture extending through the trunion, the trunion disposed
30 along the tightening region of the first jaw member;

a pin member rotatably disposed in the aperture defined in the first and second projections of the second jaw member, the pin member defining a threaded aperture extending through the pin member and in a direction generally transverse to the aperture defined in the second jaw member extending through both the first and second projections;
35 and

5 an elongate threaded tightening member disposed within the receiving slot defined in the first jaw member and also disposed within the receiving slot defined in the second jaw member, the tightening member extending through the aperture defined in the trunion and threadedly engaged with the aperture defined in the pin member disposed in the second jaw member.

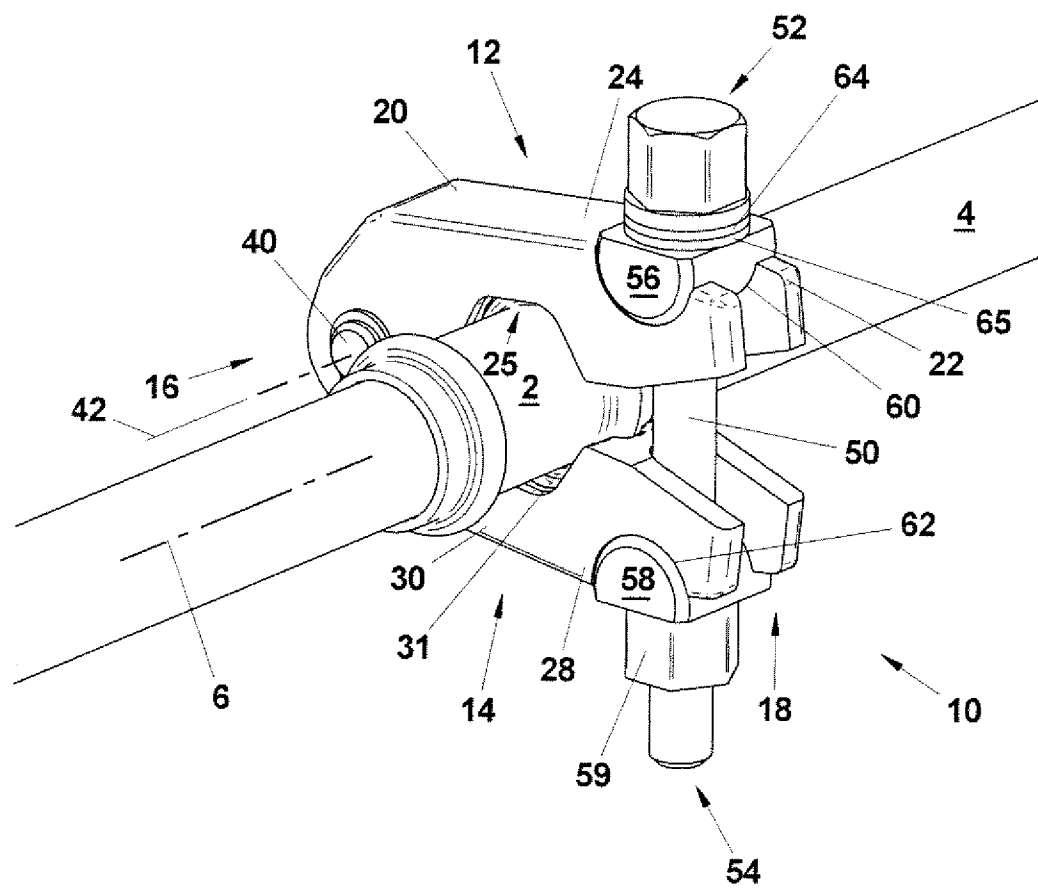
10 15. The tool of claim 14 wherein the first jaw member defines in the tightening region, a concave arcuate surface oppositely directed from the pressing surface of the first jaw member, the trunion further defining an outer surface that includes a cylindrical region, and the trunion disposed in the concave arcuate surface of the first jaw member such that at least a portion of the cylindrical region of the trunion contacts the arcuate
15 surface of the first jaw member.

 16. The tool of claim 15 wherein the receiving slot of the first jaw member is also accessible at the concave arcuate surface defined in the first jaw member.

 17. The tool of claim 15 wherein the aperture extending through the trunion is accessible at the cylindrical region of the trunion.

20 18. The tool of claim 14 wherein the elongate threaded tightening member includes a bolt head defined at one end, and the threaded tightening member positioned relative to the first jaw member such that the bolt head is proximate to the trunion disposed in the concave arcuate surface defined in the first jaw member.

 19. The tool of claim 18 further comprising:
25 a friction reducing washer disposed between the bolt head and the trunion.

*FIG. 1*

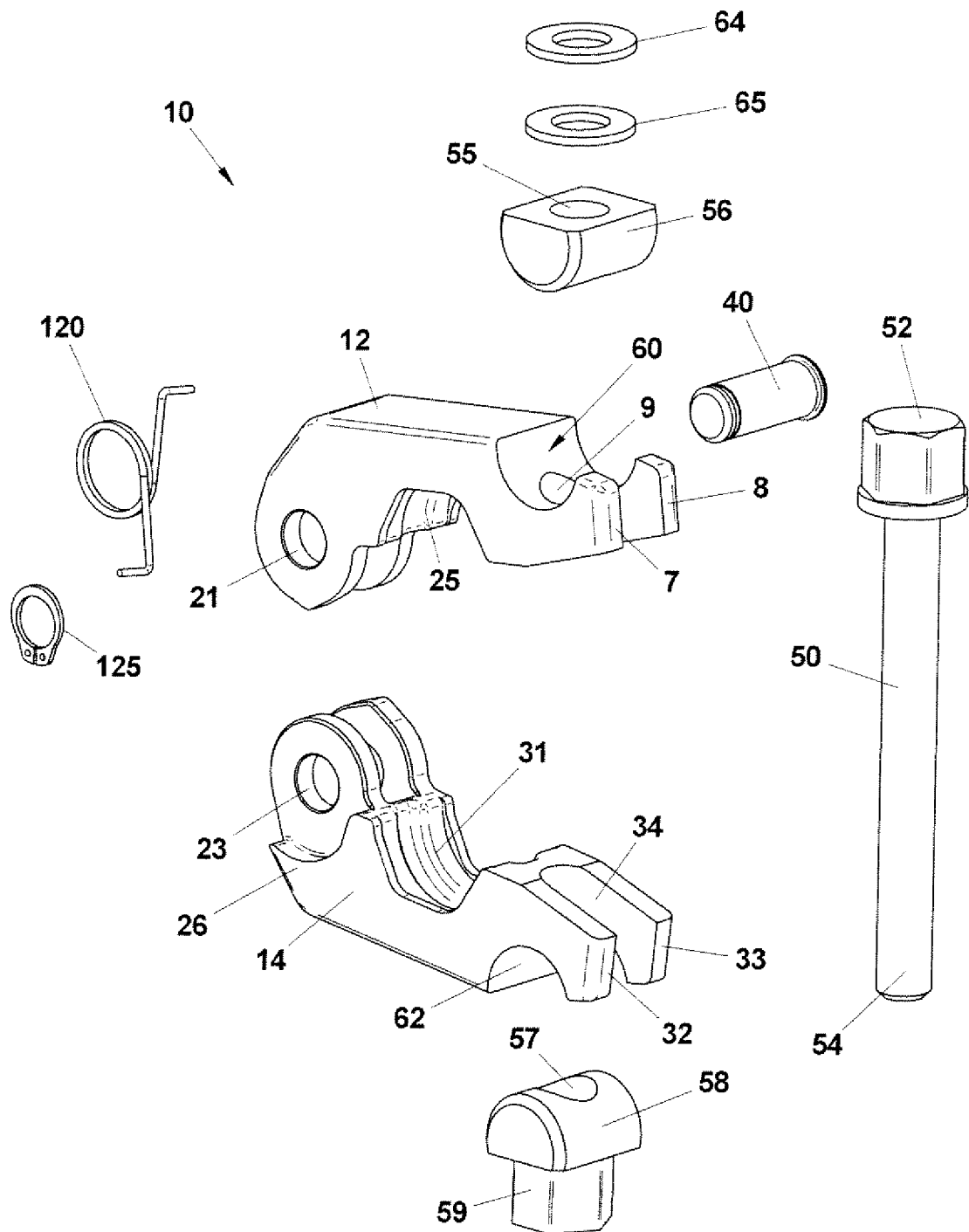


FIG. 2

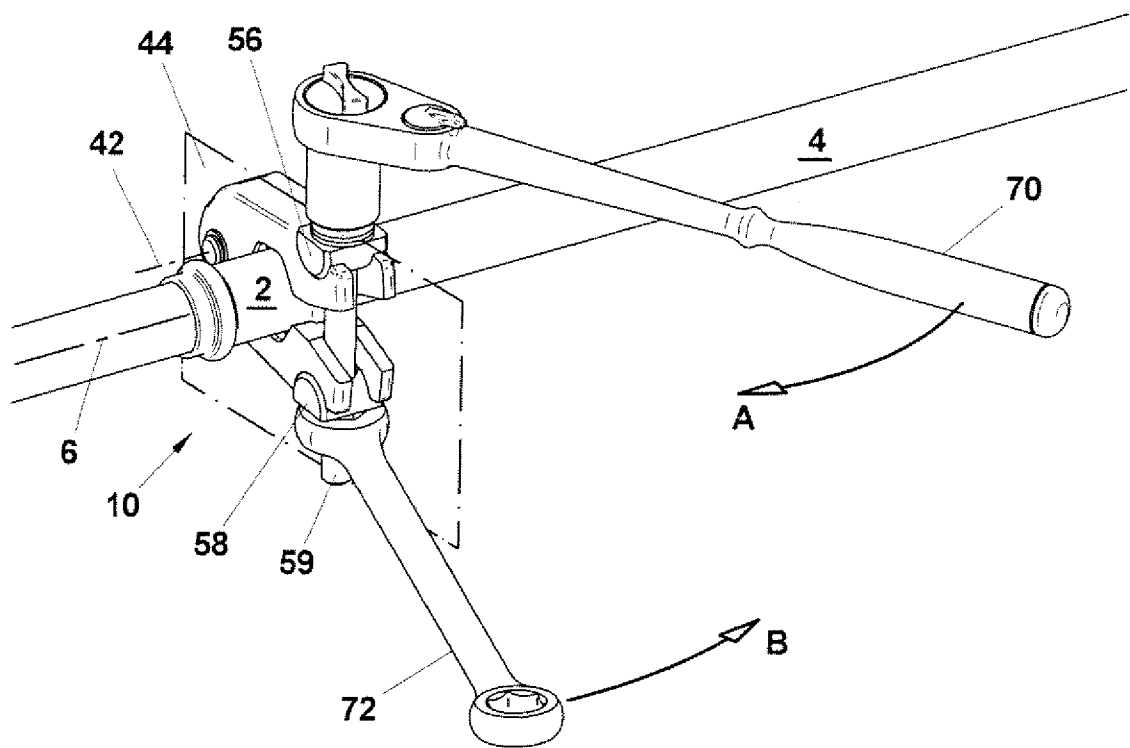


FIG. 3

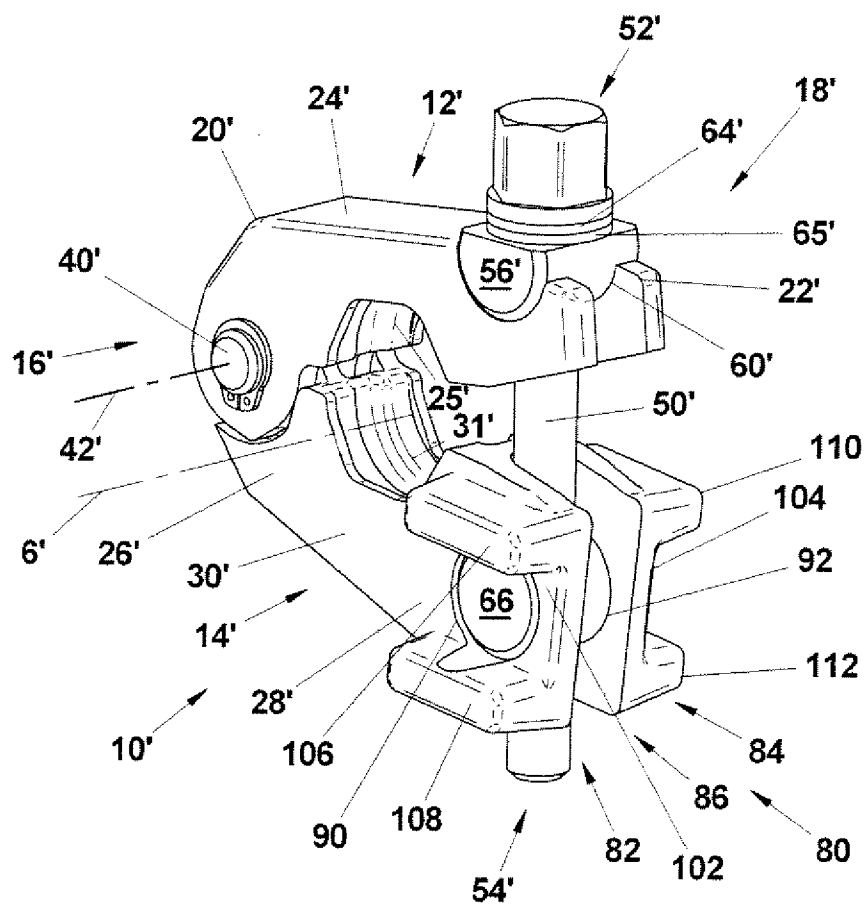


FIG. 4

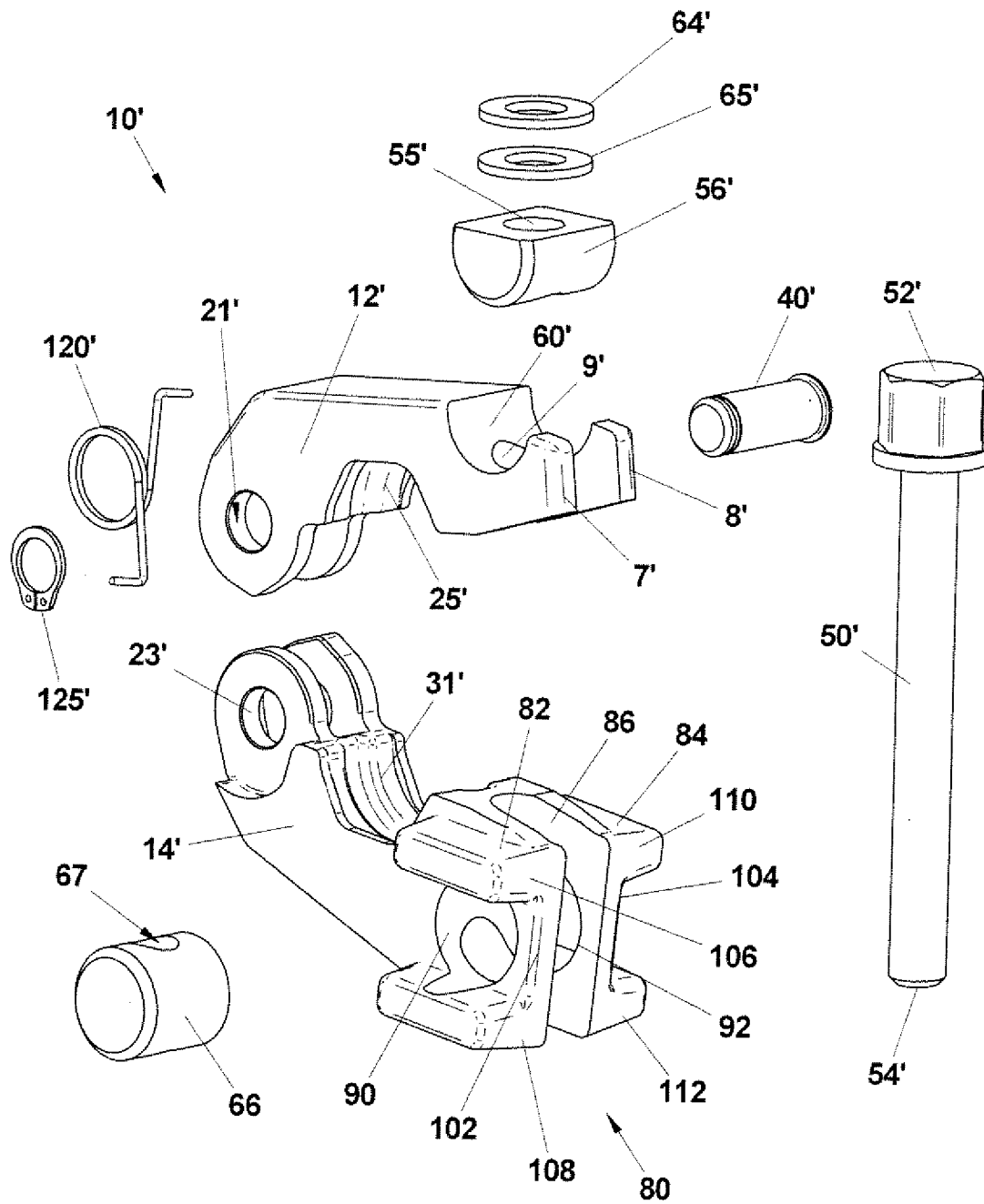


FIG. 5