

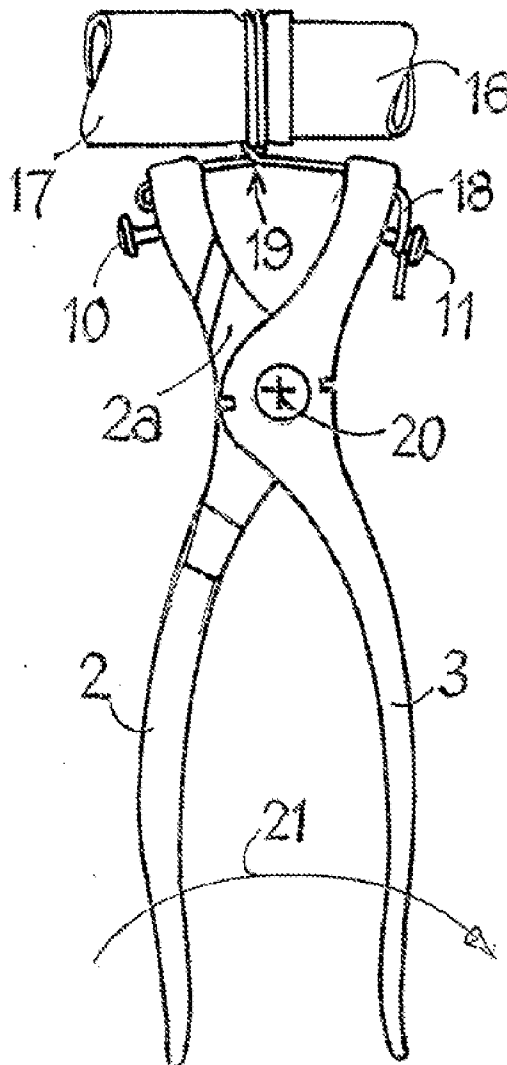


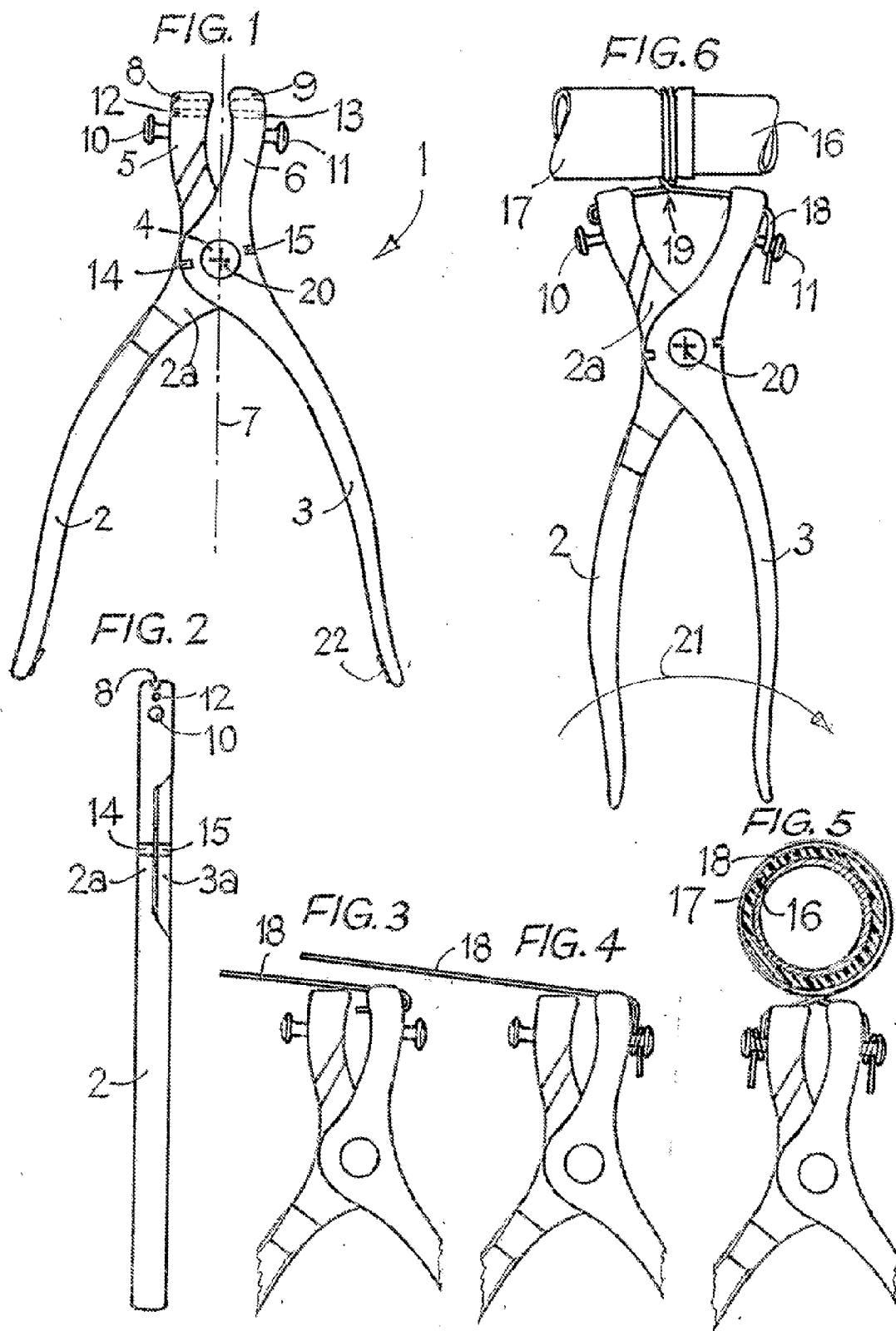
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Grieshaber(10) **Pub. No.: US 2007/0163669 A1**(43) **Pub. Date: Jul. 19, 2007**(54) **WIRE TYING IMPLEMENT****Publication Classification**(76) Inventor: **Cornelius Johannes Grieshaber,**
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MINNEAPOLIS, MN 55402 (US)(57) **ABSTRACT**(21) Appl. No.: **11/571,380**(22) PCT Filed: **May 9, 2005**(86) PCT No.: **PCT/ZA05/00081**§ 371(c)(1),
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An implement (1) for binding wire about a tube on a pipe, or other object, having a pair of pivoted handles (2, 3) and jaws, each jaw (5, 6) an integral extension of a handle and each jaw located on the same side of the pivot (4) as the respective handle; the jaws (5, 6) open as the handles are squeezed. Binding posts (10, 11), allow the securing of wire to the jaws after passing the wire around the tube and grooves (8, 9) at the ends of the jaws hold the wire at the ends of the jaws, after tensioning the wire around the tube by squeezing the handles the implement is twisted to secure the tensioned wire. Side cutters (14, 15) on the implement allow cutting off the ends of the wire for a neat finish.





WIRE TYING IMPLEMENT

FIELD OF INVENTION

[0001] This invention ties in the field of wire tying hand tools or implements, for tying or binding wire around typically a pipe where it is connected to a pipe fitting, but also around any other thing required, for example, binding a gaiter onto a pipe or tube, binding a rod or bar to strengthen it circumferentially, binding together two or more items and no doubt as many other applications as human ingenuity may devise.

BACKGROUND

[0002] U.S. Pat. No. 2,623,424, Ackerman describes a tool for tightening a noose formed with wire around a tube to be tightened onto a nipple, the implement is limited to this usage and has no means of cutting off redundant wire ends after use. U.S. Pat. No. 3,865,155 Spath describes a wire tying hand tool to tighten and secure a wire loop around an article, the tool has a handle that is turned to effect an action rather like a jacking action to tension the loop and then a separate handle is turned to secure the wire by twisting. Other tools for more specialized applications are known, e.g. to baling wire (U.S. Pat. No. 6,668,870), to block rows (JP11309536), to concrete reinforcing (U.S. Pat. No. 4,362,192), to connecting crossing bars (U.S. Pat. Nos. 3,593,759, 3,310,076, 3,169,559 and EP0388350) and binding wires (GB3243336).

[0003] As compared, for example, with a pair of pliers, these implements are complicated, waste wire, are almost impossible to use in confined spaces and do not have a facility to cut off redundant wire after securing. Use of some implements leads too easily to breaking the wire due to the user not being well aware of the force exerted by the implement. Water, fuel and gas leaks at connections are among the problems for which a suitable and convenient tool for applying a wire binding is not available.

THE INVENTION

[0004] An implement for wire binding in accordance with this invention comprises a pair of handles that are pivotally connected with a jaw extending from each handle beyond the pivot, characterized in that each jaw is on the same side of a longitudinal centre line of the implement as the handle from which the jaw extends, and a groove and one selected from a tie-post and a hole, or both a tie post and hole, are located at the end of each jaw.

[0005] A preferred embodiment has all three, the groove, hole and tie post at the end of each jaw, allowing some alternatives for the user.

[0006] Thus in contrast to the familiar pliers the jaws do not cross over at the pivot so as to close as the handles are squeezed closed; instead the jaws open as the handles are squeezed.

[0007] It is most advantageous, even desirable, almost essential that the groove is carefully chamfered at the ends of the grooves so as to avoid sharp edges and corners. These would be inclined to cause premature breaking of wire when the wire is being tensioned by the implement.

[0008] Preferably the implement is given a groove in each handle of the implement near the pivotal connection, which

overlap when the handles are opened and execute a scissors-type cutting action when the handles are closed towards each other.

THE DRAWINGS

[0009] The invention is described by way of example of a preferred embodiment shown with reference to the drawings, in which:

[0010] FIG. 1 is a view of the implement with its jaws closed,

[0011] FIG. 2 is a side view of the implement,

[0012] FIG. 3 is a view of the jaw region of the implement showing a start position in its use,

[0013] FIG. 4 is a view of the jaw region of the implement showing an alternative start position in its use, and

[0014] FIG. 5 is a view of the implement showing a wire bound around a tube, with jaws closed, wire secured, preparatory to tensioning the wire.

[0015] FIG. 6 is a view of the implement with its jaws opened having tensioned a wire around a tube and starting to twist a wire,

THE PREFERRED EMBODIMENTS

[0016] As shown in FIGS. 1 and 2, the implement 1 for wire binding comprises a pair of handles 2, 3 that are pivotally connected by a pivot pin 4 with a jaw 5, 6 extending integrally from each handle 2, 3 respectively beyond the pivot. Each jaw 5, 6 is on the same side of a longitudinal centre line 7 of the implement as the handle 2, 3 respectively from which the jaw extends. As will be seen in FIG. 1, the reference to a "longitudinal centre line" is more strictly speaking a reference to a longitudinally oriented plane which is coincident with the axis 20 of the pivot pin; for convenience the quoted phrase will be used in this specification. A groove 8, 9 is located at the end of each jaw 5, 6 respectively, the edges of the grooves are rounded off or chamfered. A tie-post 10, 11 is located at the end of each jaw and a hole 12, 13 also located at the end of each jaw. Grooves 14, 15 are located in the handles near the pivot to serve as wire cutters. Each half of the implement 2, 3 is identical to the other, each having a thinned part 2a, 3a where they are pivotally connected with each other.

[0017] The use of the implement may be described with reference to FIGS. 3 to 6, in which successive steps of the method of use are shown.

[0018] As a first step, as shown in FIG. 3 or as an alternative in FIG. 4, a wire 18 is either inserted through the hole 13 (FIG. 3) and bent over sharply towards the other jaw; the wire passes through the groove 9. Alternatively the wire is wound around tie post 11 and again bent over sharply towards the other jaw, passing through the jaw 9 (FIG. 4). The wire may be a length drawn off a reel of wire, but need not be severed from the reel at this stage. A pipe 16 with a tube or hose 17 which is to be secured and sealed to it is placed against the jaws of the implement, the pipe oriented with its longitudinal axis parallel to the axis of the pivot of the implement (FIG. 5). The wire is then wound around the post 10 to secure it. The handles of the implement are then squeezed closed, which opens the jaws and applies a strong

tension to the wire. The leverage provided by the implement allows a very large tension to be developed if desired and it is a specific advantage of the invention that the person using the implement can feel the extent of the force applied and observe the effect of the wire digging into the tube or hose and so judge the degree of tension required in the wire to a fine degree, especially with a little experience in use of the implement. The implement is then twisted while maintaining the pressure on the handles and the implement is shown having been twisted through ninety degrees in FIG. 6, the view itself rotated to show the implement in side view. This shows the jaws open and the wire crossed over at the position 19; the squeezing on the handles should then be eased a bit and the implement withdrawn a small distance and the implement can then be twisted through a few more degrees, e.g. another ninety degrees or more (arrow 21), as may be required to secure the wire. The wire is then detached from the post and hole or post and is cut off neatly using the cutter grooves. The cut off ends can then be pressed down flush against the tube or hose using the handles. The handles may have a pad area provided to facilitate this step. This completes the binding of the tube or hose to the pipe.

[0019] It is found that the implement can handle a range of wire sizes, for example, one measuring 20 cm in overall length can effectively work with wire from 0,05 mm thickness to 2 mm thickness; other models can work thicker wire. The implement is made of a suitable steel, optionally heat treated, preferably worked off neatly, machined for the grooves, holes, pin and posts fitted and corrosion treated, e.g. galvanized.

REFERENCE NUMERALS

- [0020] 1 implement
- [0021] 2 left handle
- [0022] 3 right handle
- [0023] 4 pivot pin
- [0024] 5 left jaw
- [0025] 6 right jaw
- [0026] 7 longitudinal centre line
- [0027] 8 groove in left jaw
- [0028] 9 groove in right jaw
- [0029] 10 left binding post
- [0030] 11 right binding post
- [0031] 12 left hole
- [0032] 13 right hole

- [0033] 14 cutting groove
- [0034] 15 cutting groove
- [0035] 16 pipe
- [0036] 17 tube
- [0037] 18 binding wire
- [0038] 19 cross-over point of wire
- [0039] 20 axis of pivot
- [0040] 21 arrow showing direction of twisting
- [0041] 22 pads to press down ends

1-7. (canceled)

8. An implement for binding and clamping wire tightly around pipes or other objects, which comprises a pair of handles that are pivotally connected by a pivot pin, with a jaw extending from each handle beyond the pivot, in which each jaw is on the same side of a longitudinally oriented plane which is coincident with the axis of the pivot pin as the handle from which the jaw extends, with a groove located at the end of each jaw and one or both selected from a tiepost and a hole located at the end of each jaw, characterized in that the jaws extend integrally from the handles and are directly connected, the groove of each jaw being aligned with the groove of the other jaw, so that the handles may be squeezed closed using only one hand to feel the extent of the force applied and the implement twisted while maintaining pressure on handles.

9. The implement of claim 8, wherein the handles are given pad areas which facilitate pressing ends of the wire down onto the pipe or other object.

10. An implement for binding and clamping wire tightly around pipes or other objects, which comprises a pair of handles that are pivotally connected by a pivot pin, with a jaw extending from each handle beyond the pivot, in which each jaw is on the same side of a longitudinally oriented plane which is coincident with the axis of the pivot pin as the handle from which the jaw extends, with a groove located at the end of each jaw and one or both selected from a tiepost and a hole located at the end of each jaw, characterized in that the jaws extend integrally from the handles and are directly connected, each half of the implement being identical with the other half and having a thinned part where they are pivotally connected, so that the handles may be squeezed closed using only one hand to feel the extent of the force applied and the implement twisted while maintaining pressure on the handles.

11. The implement of claim 10, wherein the handles are given pad areas which facilitate pressing ends of the wire down onto the pipe or other object.

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