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[54] PLASTIC PIPE GRIPPING TOOL

[72] Inventors: George O. Pynchon, 54 Northfield Avenue, Northfield, Ohio 44067; James H. Hulse, Jr., 116 Elmridge Road, Mansfield, Ohio 44907

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[58] Field of Search.....81/5.1 R, 367-380, 81/DIG. 1; 269/4, 201, 228, 321 W, 270; 29/272, 283; 248/58, 316 R, 316 A, 316 B

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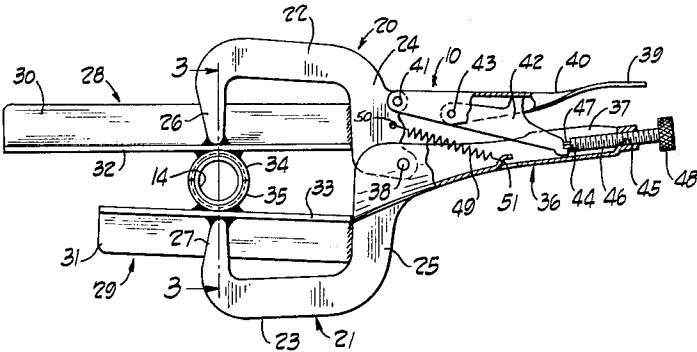
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Primary Examiner—Theron E. Condon
Attorney—Sanford Schnurmacher

[57] ABSTRACT

The invention relates to a vice-grip plier having rest surfaces adapted to maintain the pliar in a horizontal plane on the top end of a well casing while holding a plastic pipe, being inserted into the casing, in a vertical plane centered in the casing.

3 Claims, 4 Drawing Figures



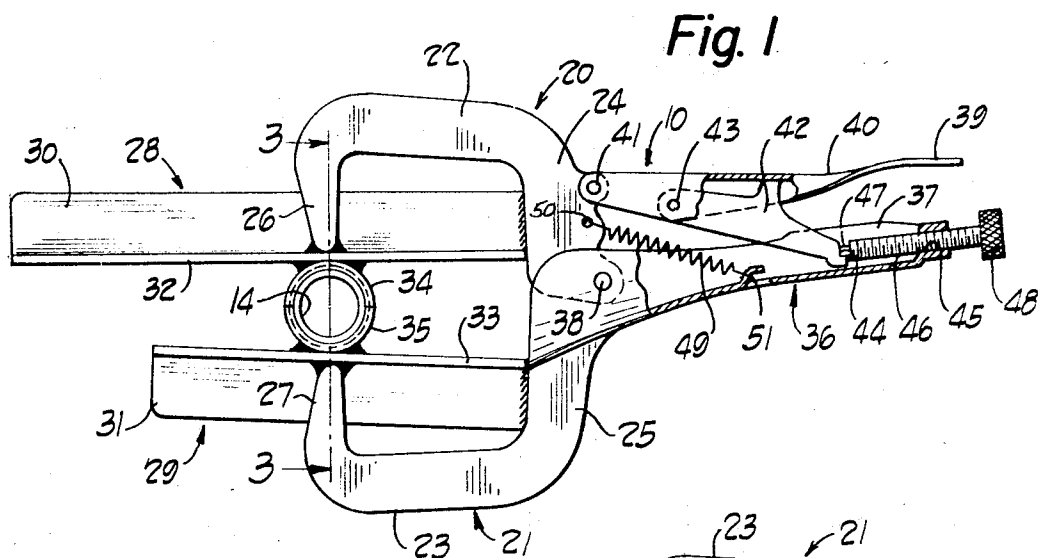
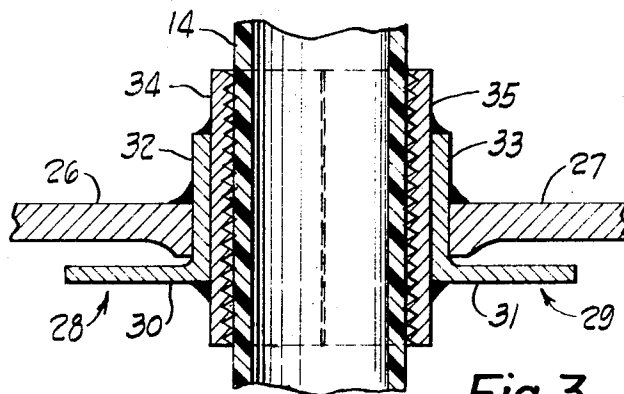
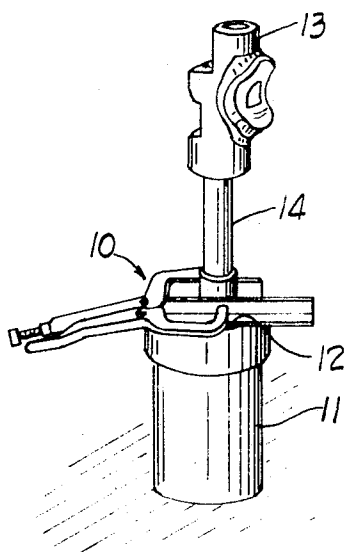
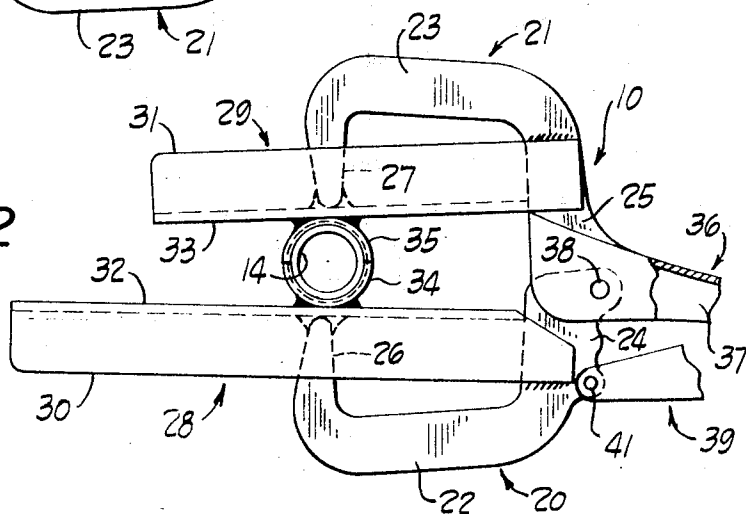


Fig. 2



INVENTORS.
 GEORGE O. DYNCHON
 BY JAMES H. HULSE JR.
Sanford Schurmaker
 ATTORNEY.

PLASTIC PIPE GRIPPING TOOL

Conducive to a better understanding of the invention it may be well to point out that the current practice in water well construction is to insert a long plastic water delivery pipe into a well casing, having a submersible pump at its lower end and a pitless adapter at its upper end, proximate the rim of the casing.

The pump, pipe and adapter are assembled prior to installation, requiring one workman at the well casing, to guide the insertion of the assembly, and a second workman at the adapter end of the assembly to carry it toward the well as the pipe is fed into the casing.

The primary object of the invention, therefore, is to provide a plastic pipe gripping tool that will enable the assembling and mounting of the pump, pipe and pitless adapter in a well casing to be done by a single workman.

Another object is to provide a labor-saving device of the type stated having opposed concave pipe-gripping jaws for temporarily engaging the pipe, and substantially parallel rest brackets, at 90° to the jaws, which are of a length to extend across and rest on the top end of the well casing, to permit additional lengths of pipe or accessory equipment to be secured to the gripped pipe already positioned within the casing, thus actually enabling the water-delivery system to be fabricated by a single workman at the well casing.

Further objects are to provide a plastic-pipe gripping tool which is comparatively simple in construction, strong, durable, compact, of light weight and which may be manufactured at low cost.

These and other objects of this invention will become apparent from a reading of the following specification and claims, together with the accompanying drawing, wherein like parts are referred to and indicated by like reference numerals, and wherein:

FIG. 1 is a top plan view of the plastic pipe gripping tool, that is the subject of the invention, in its pipe gripping position;

FIG. 2 is a bottom plan view of the same;

FIG. 3 is a sectional view taken along the line and in the direction of arrows 3—3 of FIG. 1; and

FIG. 4 illustrates the manner of using the tool.

Referring more particularly to the drawing there is seen in FIG. 1 the plastic pipe gripping tool that is the subject of the invention, broadly indicated by reference numeral 10, in locked engagement with pipe 14.

The tool 10 comprises two arms 20 and 21, each of which is substantially in the form of a letter C.

The arm 20 comprises the long back bar 22 and rear and the forward legs 24 and 26, respectively, are integral, substantially right angular continuations of the back bar 22.

The arm 21, which may be defined as the fixed arm, is also of substantially the same shape as the arm 20 in that it comprises the back bar 23 and the rear and forward legs 25 and 27, respectively.

Reference numerals 28 and 29 indicate elongated angle-irons mounted on the undersurfaces of the arms 20 and 21, as seen most clearly in FIG. 2. Each angle-iron 28 and 29 is anchored on the rear and forward legs 24, 26 and 25, 27, respectively, and extends forwardly of the forward legs 26 and 27. The angle-iron 28 being longer than the angle-iron 29 to define a handle extending forwardly of the leg 26.

The underfaces 30 and 31 of the so mounted angle-irons 28 and 29 are disposed in a common plane, as seen most clearly in FIG. 3, to define a rest surface.

Reference numerals 34 and 35 indicate opposed, concave, gripper jaws mounted on the vertical sides 32 and 33 of the so positioned angle-irons, at the arm forward legs 26 and 27, at 90° to the rest surfaces 30 and 31, as again most clearly seen in FIG. 3.

The concave, inner jaw surfaces are of a diameter to cooperatively grip the peripheral surface of a tubular work-piece, such as the pipe 14, positioned therebetween when the arms are in their locked positions, as described hereinafter.

The jaws 34 and 35 are internally threaded to provide a non-slip gripping surface.

The rear leg of the arm 21 is rigidly joined to the forward end of a handle 36, which is of channel form and accordingly includes the spaced side flanges 37.

At the forward end of the handle 36 the free end of the rear leg 24 of the arm 20 is positioned between the flanges 37 and pivotally coupled to the same as indicated at 38, whereby the arm 20 is oscillatable or swingable in the plane of the fixed arm 21, and the arms are set so that the gripper jaws 34 and 35, at the forward legs 26 and 27 may be brought into opposed abutting relation.

At the back edge of the rear leg 24 of the arm 20 there is pivotally attached, as at 41, one end of a hand lever 39.

Rearwardly of the pivot 41 the hand lever, which is also of channel cross section, has secured between the side flanges 40 thereof, a pivot pin 43. This pivot pin lies in a line extending longitudinally of the tool, passing between the pivots 38 and 41, and the pivot 43 is rearwardly of the other two pivots so that the three pivots for a triangular arrangement, as shown in FIG. 1.

Interposed between the handle 36 and lever 39, which constitutes a second handle which is movable relative to the handle 36, is a toggle link 42 which has one end positioned between the flanges 40 of the lever 39 and pivoted on the pivot 43 while the opposite end of the toggle link extends rearwardly and in the channel of the handle 36 and is formed with a rearwardly directed shoulder 44.

The back end of the channel forming the handle 36 is closed and provided with a threaded passage 45 through which is threadedly extended the adjustment screw 46, the forward end of which, 47, bears against the shoulder 44 of the toggle link 42.

The rear end of the screw 46 carries a knurled head 48 which is rearwardly of the handle 36, as shown, so that the screw may be conveniently turned to force the toggle link 42 forwardly thereby applying thrust to the pivot 41 and causing the jaws 34 and 35, at the arm legs 26 and 27, to be moved together.

Reverse movement of the screw 46 permits the opening of the jaws 34 and 35. The opening action is facilitated by a spring 49 which has one end attached as at 50 to the back edge of the leg 24 between the pivots 41 and 38, while the other end of the spring extends down into the channel of the handle 36 and is secured thereto by means of the hook 51.

The toggle link coupling the handle 36 and hand lever 39 is such, as will be readily apparent, that when the jaws 34 and 35 are properly set to lightly grip a pipe 14 between them, the application of pressure to the lever 39 to force its free rear end toward the handle 36, will cause the pivot center 43 to move inwardly toward the handle 36 slightly beyond a line extending between the pivot 41 and the point of contact of the screw end 47 against the shoulder 44.

In this manner the jaws 34 and 35 will be held locked in gripping relation with a work-piece, such as the pipe 14, interposed between them, as seen in FIG. 3.

In using the tool to install a water-delivery pipe in a well casing 11, illustrated in FIG. 4, a submersible pump, not shown, is mounted on a length of pipe 14 and the tool 10 is clamped near the free end of the pipe. The pump and pipe are then lowered into the casing 11 until the parallel under-faces 30 and 31 of the angle-irons 28 and 29 rest on the top edge 12 of the casing.

The so gripped pipe 11 will be held suspended vertically in the casing 11. A second length of pipe 14 may now be joined to the gripped pipe.

The tool is then released and replaced at the top end of the second pipe length and the pipe again lowered until the angle-iron underfaces 30 and 31 rest on the upper edge 12 of the casing 11.

Succeeding lengths of pipe are added by following the same procedure. After the pump is at the proper level in the well a pitless adapter 13 and fittings are mounted on the upper end of the delivery pipe 14, as again seen in FIG. 4.

The entire procedure described can be performed at the head of the well casing 11 by a single workman.

This tool does away with the necessity of pre-assembly of the entire water-delivery unit before any of it is inserted in the casing 11, as has been required heretofore.

We claim:

1. A plastic pipe gripping tool of the character set forth, 5 comprising:
 - a. two substantially C-shaped arms disposed in a common plane with their open sides opposed;
 - b. each arm having a back bar and forward and rear legs extending from the ends of the back bars;
 - c. an elongated angle-iron rigidly mounted between the rear and forward legs of each of the arms extending forwardly of the forward legs thereof, with their underfaces disposed in a common plane to define a rest surface;
 - d. opposed concave jaws mounted on the so positioned angle-irons at 90° to the rest surfaces thereof, at the forward legs of the arms, and of a diameter to co-operatively grip the peripheral surface of the tubular work-piece positioned therebetween when the arms are in their locked condition;
 - e. a handle having one end rigidly fixed to the rear leg of one

arm;

f. a pivot coupling between the end of the rear leg of the outer arm and the said end of said handle;

g. a handle lever;

h. a pivot coupling between one end of said lever and the rear leg of said outer arm at a location of substantial distance outwardly from the pivot coupling between the end of said leg of said outer arm and the said end of the fixed handle;

i. the concave jaws being positioned to be brought into opposing contacting relation; and,

j. a toggle link coupling between the handle and the handle lever for locking the jaws against separation when the handle and lever are forced together.

2. A plastic pipe gripping tool, as in claim 1, wherein one angle-iron is longer than the other to define a handle extending forwardly of the arm forward legs.

3. A plastic pipe gripping tool, as in claim 1, wherein the concave faces of the opposed jaws are roughened to provide frictional contact surfaces.

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