Feb. 5, 1957 J. F. McCOWN 2,780,122

TOOL FOR REMOVING DENTS FROM THIN WALL PIPE

Filed Sept. 20, 1955

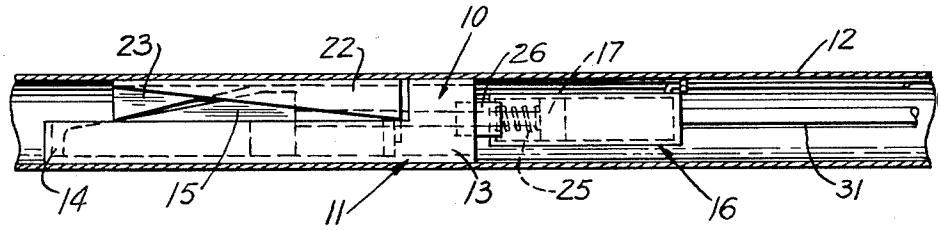


FIG. 1

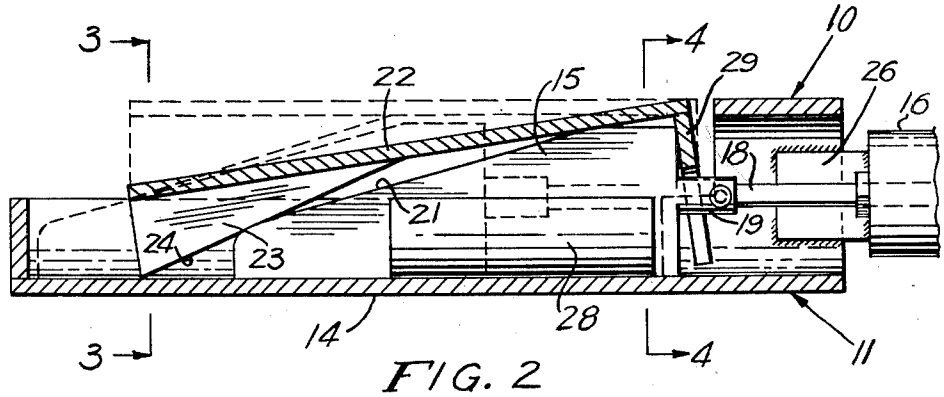


FIG. 2

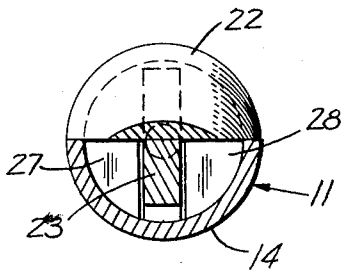


FIG. 3

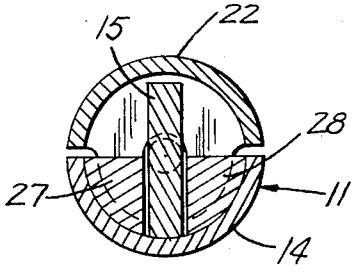


FIG. 4

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United States Patent Office 2,780,122 Patented Feb. 5, 1957

2,780,122

TOOL FOR REMOVING DENTS FROM THIN WALL PIPE

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Application September 20, 1955, Serial No. 535,363

3 Claims. (Cl. 81—15)

This invention relates to a tool for removing dents from thin-walled pipe.

An object of the present invention is to provide a tool which is portable and may be used to remove dents from thin wall aluminum irrigation pipe in place on the ground.

Another object of the present invention is to provide a tool for removing dents from thin wall pipe having fluid pressure operating means which may be connected to the hydraulic pump on a tractor or to another source of fluid pressure.

A further object of the present invention is to provide a tool for removing dents from thin wall pipe which is sturdy in construction having few parts, and one which may be easily assembled and disassembled.

A further object of the present invention is to provide a tool for removing dents from thin wall irrigation pipe which may be constructed in sizes to fit other sizes of irrigation pipe, one which is highly effective in action, and one which is commercially practical.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawing, in which:

Figure 1 is an elevational view of the tool of the present invention in a position of use within a pipe, the latter being shown in section,

Figure 2 is a sectional view, on an enlarged scale of the assembly of Figure 1 removed from the pipe and with a portion of the hydraulic cylinder assembly broken away,

Figure 3 is a sectional view taken on the line 3—3 of Figure 2, and

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Referring in greater detail to the drawing in which like numerals indicate like parts throughout the several views, the tool of the present invention is intended to be used for removing dents from thin-walled pipe such as aluminum pipe used in irrigation and is designated generally by the reference numeral 10. The tool 10 comprises a support member 11 adapted to be insertable in a pipe 12, as shown in Figure 1. The support member 11 includes a cylindrical portion 13 of a size to fit within the pipe 12 and a semicylindrical portion 14 projecting from one end of the cylindrical portion 13 and conformably shaped to engage the portion of the pipe 12 opposite to the dent in the pipe 12 when the support member 11 is inserted in the pipe 12. An upstanding actuating member 15 is positioned medially of the semicylindrical portion 14 and is mounted upon the semicylindrical portion for longitudinal forward and backward movements.

Means is provided operatively connected to the end of the actuating member 15 adjacent the cylindrical portion 13 of the support member 11 for effecting the movement of the actuating member 15. Specifically, this means comprises a hydraulic cylinder 16 having a piston 17 slidably mounted therewithin, a piston rod 18 having one end fixedly secured to the piston and having its other end received in a socket provided in an outwardly projecting boss 19 on the one end of the actuating member 15 which is adjacent to the cylindrical portion 13 of the support member 11.

The actuating member 15 has its upper end sloping upwardly, as indicated by the reference numeral 21 in Figure 2, from its other end to a point spaced from the end adjacent the cylindrical portion of the support member 11.

An anvil member 22 is disposed longitudinally of and above the actuating member 15. A rib 23 depends from the underface of the anvil member 22 and has a surface which slopes downwardly from a point adjacent to the central point of the anvil member to the other end of the anvil member 22. The sloping surface of the rib 23 is indicated by the reference numeral 24 in Figure 2.

The sloping surface 24 of the rib 23 normally rests upon and is movable upwardly along the upwardly-sloping surface of the actuating member 15 in response to the execution of the forward movement of the actuating member 15 whenever hydraulic fluid is admitted to the hydraulic cylinder 16 behind the piston 17 to effect corresponding movement of the piston 17 and the piston rod 18. A spring 25 within the hydraulic cylinder 16 is operatively connected to the piston 17 to effect its backward movement into the hydraulic cylinder 16 whenever a valve (not shown) used for controlling the admission of fluid to the hydraulic cylinder 16 is turned to a reverse position to allow the fluid within the cylinder 16 to be returned to the reservoir of the pump supplying the fluid under pressure. The hydraulic cylinder 16 is secured to the cylindrical portion 13 of the support member 11 by means of a pair of plates 26, one of them being seen in Figure 2 welded to the cylindrical portion 13 and to the adjacent end of the hydraulic cylinder 16. A pair of guide blocks 27 and 28 extend on each side of the actuating member 15 and are welded in place in the semicylindrical portion 14 of the support member adjacent the end of the latter which is connected to the cylindrical portion 13. The anvil member 22 has a bifurcated end plate 29 having its lower ends extending on each side of the boss 19 and has its ends engaged with the ends of the guide blocks 27 and 28 to prevent the movement of the anvil member 22 relative to the semicylindrical portion 14 when the actuating member 15 is moved forwardly as a result of forward movement of the piston rod.

In use, the removing tool 10 is inserted into a pipe 12 having a dent to be removed therefrom, as shown in Figure 1, by means of an extension handle 31 secured to the hydraulic cylinder 16. Upon admission under pressure to the hydraulic cylinder 16, the actuating member 15 is moved forwardly so that its upper end will engage the surface of the rib 23 and cause the anvil member 22 to move upwardly to push out the dent in the pipe. The anvil 22 may also be used to back up the pipe surface so that a hammer may be used to smooth out outwardly-extending bumps or wrinkles in the pipe 12. Other sections may be added to the handle 31 so that the tool may be used in longer lengths of pipe when necessary.

What is claimed is:

1. A dent-removing tool comprising a support member adapted to be inserted into an end of a pipe, said support member including a cylindrical portion to fit within said pipe and a semicylindrical portion projecting from one end of the cylindrical portion to engage the portion of the pipe opposite to a dent in said pipe when inserted therein, an upstanding actuating member posi-

tioned medially of said semicylindrical portion with one end adjacent said cylindrical portion and mounted on said semicylindrical portion for longitudinal forward and backward movements, means connected to the end of said actuating member adjacent said cylindrical portion for effecting the movements of the latter, said actuating member having its upper side sloping upwardly from its free end to a point spaced from the end adjacent said cylindrical portion, an anvil member disposed longitudinally of and above said actuating member and connected adjacent one end to the semicylindrical portion for up and down movement about a horizontal axis transverse of said semicylindrical portion, and a rib on the under face of said anvil member, said rib having a surface which slopes downwardly from a point adjacent the central point of said anvil member to the free end thereof, the sloping surface of said rib normally resting upon and movable upwardly along the upwardly-sloping surface of said actuating member in response to the execution of the forward movement of said actuating member.

2. A dent-removing tool comprising a support member adapted to be inserted into an end of a pipe, said support member including a cylindrical portion to fit within said pipe and a semicylindrical portion projecting from one end of the cylindrical portion to engage the portion of the pipe opposite to a dent in said pipe when inserted therein, an upstanding actuating member positioned medially of said semicylindrical portion with one end adjacent said cylindrical portion and mounted on said semicylindrical portion for longitudinal forward and backward movements, means connected to the end of said actuating member adjacent said cylindrical portion for effecting the movements of the latter, said actuating member having its upper side sloping upwardly from its free end to a point spaced from the end adjacent said cylindrical portion, an anvil member disposed longitudinally of and above said actuating member and connected adjacent one end to the semicylindrical portion for up and down movement about a horizontal axis transverse of said semicylindrical portion, a rib on the under face of said anvil member, said rib having a surface which slopes downwardly from a point adjacent the central point of said anvil member to the free end thereof, the sloping surface of said rib normally resting upon and movable upwardly along the upwardly-sloping surface of said actuating member in response to the execution of the forward movement of said actuating member, and spring

means connected to said actuating member for effecting the backward movement of the latter upon completion of its forward movement.

3. A dent-removing tool comprising a support member adapted to be inserted into an end of a pipe, said support member including a cylindrical portion to fit within said pipe and a semicylindrical portion projecting from one end of the cylindrical portion to engage the portion of the pipe opposite to a dent in said pipe when inserted therein, an upstanding actuating member positioned medially of said semicylindrical portion with one end adjacent said cylindrical portion and mounted on said semicylindrical portion for longitudinal forward and backward movements, hydraulic means connected to the end of said actuating member adjacent said cylindrical portion for effecting the movements of the latter, said actuating member having its upper side sloping upwardly from its free end to a point spaced from the end adjacent said cylindrical portion, a pair of guide blocks arranged longitudinally of said semicylindrical portion with corresponding ends adjacent to and spaced from said cylindrical portion, an anvil member disposed longitudinally of and above said actuating member and loosely connected adjacent one end to the semicylindrical portion intermediate said cylindrical portion and said guide blocks for up and down movement about a horizontal axis transverse of said semicylindrical portion, and a rib on the under face of said anvil member, said rib having a surface which slopes downwardly from a point adjacent the central point of said anvil member to the free end thereof, the sloping surface of said rib normally resting upon and movable upwardly along the upwardly sloping surface of said actuating member in response to the execution of the forward movement of said actuating member.

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