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(54) **RATCHET PIPE ENLARGING TOOL**

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(57) **ABSTRACT**

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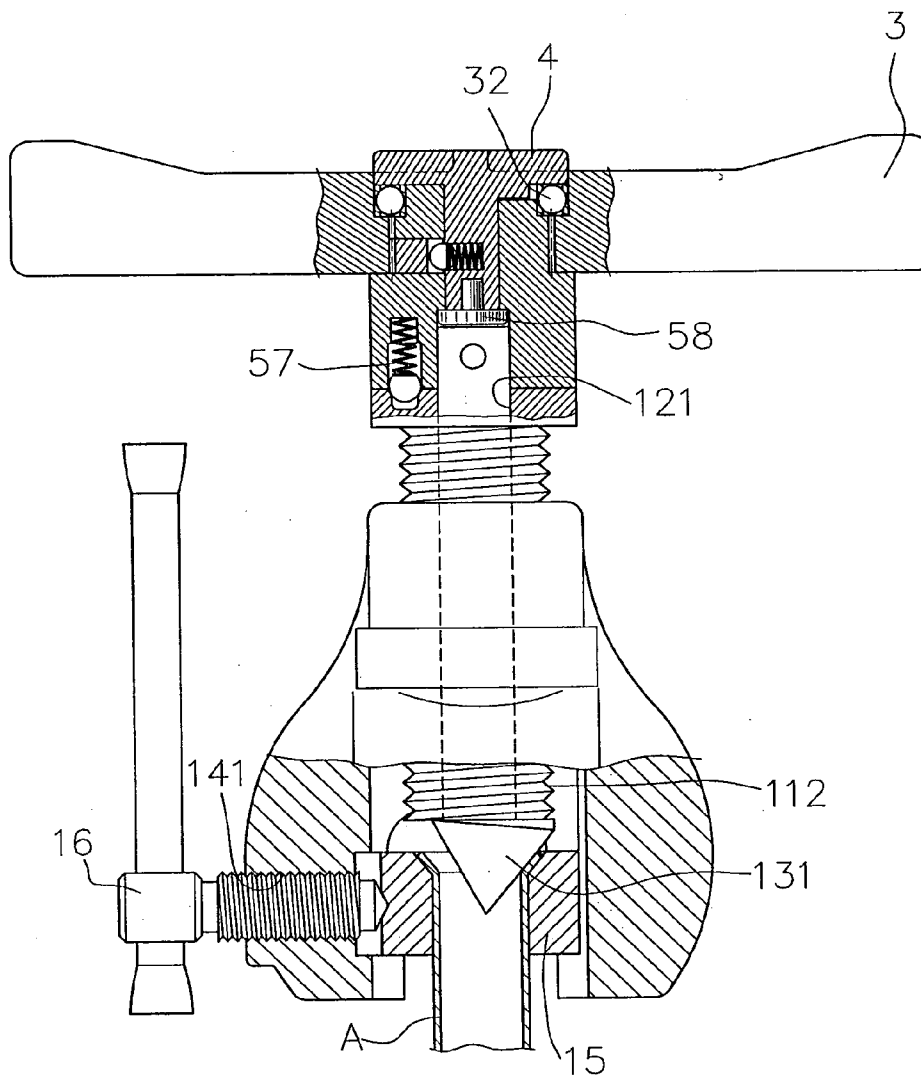
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A pipe enlarging tool includes a ratchet mechanism that includes a base securely connected to the threaded rod that has a cone member to enlarge pipes clamped by a chuck assembly in the base of the tool. A ratchet is pivotably connected to the cap and selectively engaged with the toothed inner periphery of the handle which is rotatably mounted to the cap. A knob includes a positioning assembly which biases the ratchet to push one of two toothed ends of the ratchet to engage with the toothed inner periphery of the handle. The handle can be reciprocally operated by the ratchet mechanism to move the threaded rod to enlarge the pipe or to remove the cone member from the pipe.

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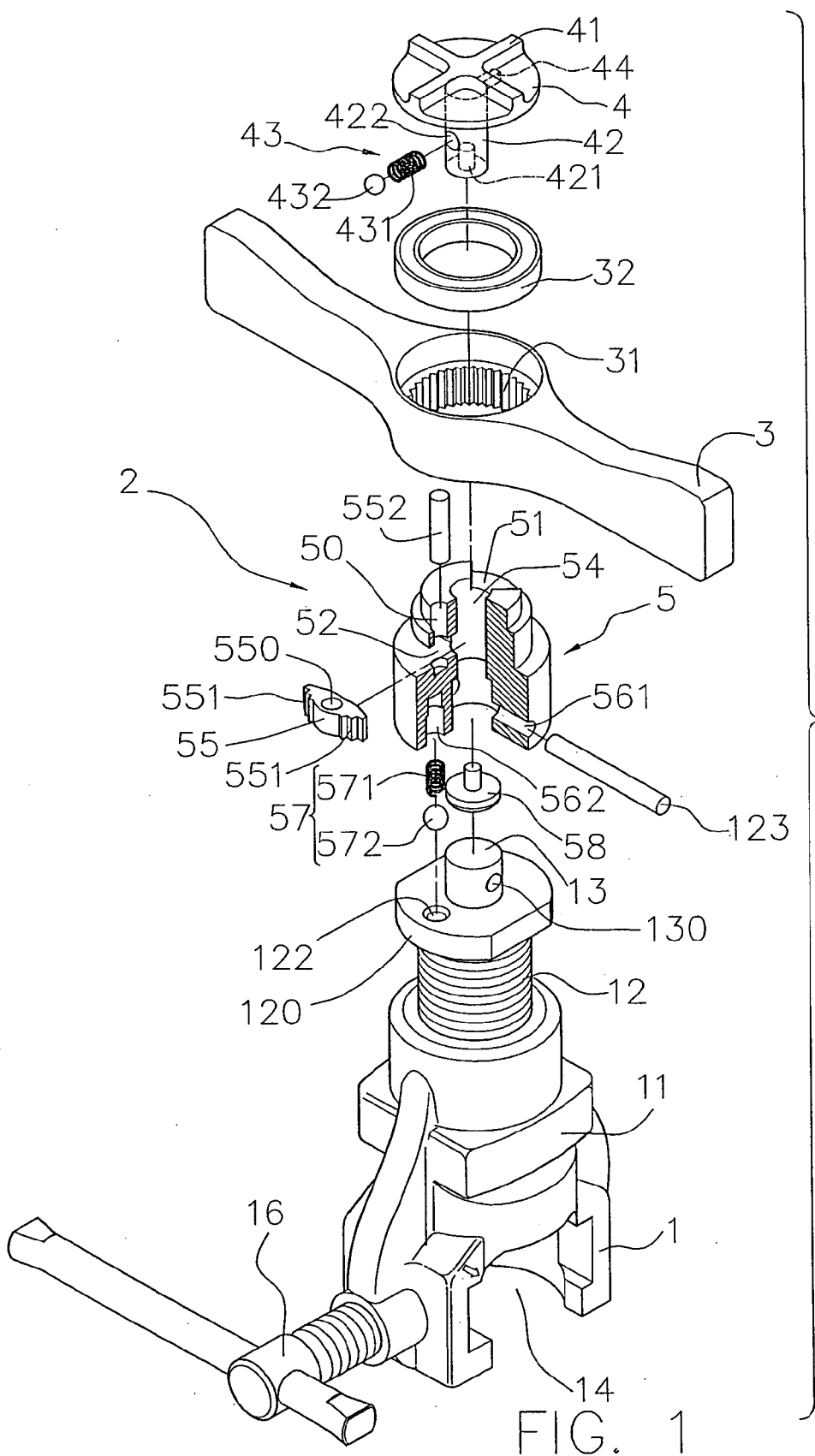


FIG. 1

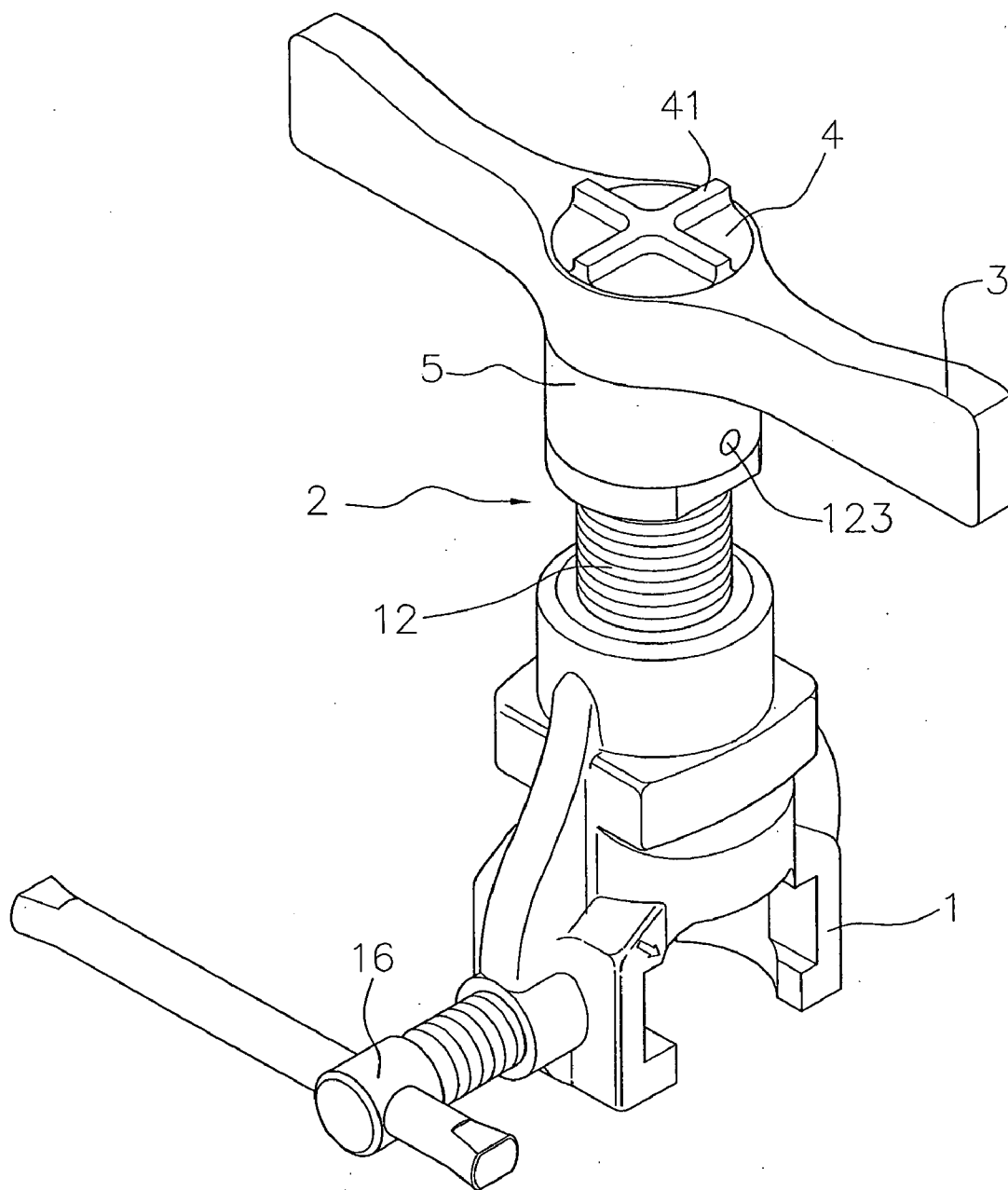


FIG. 2

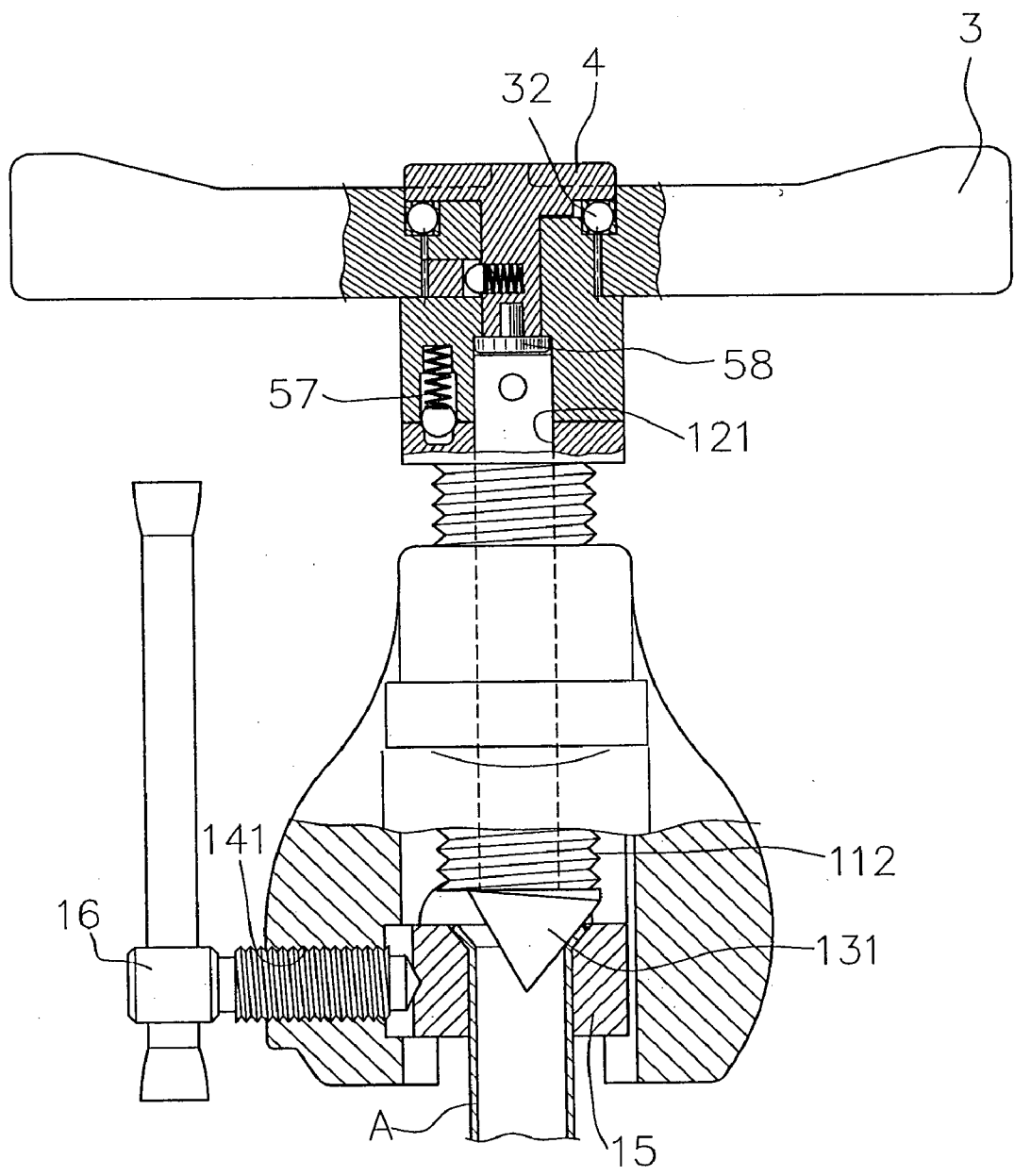


FIG. 3

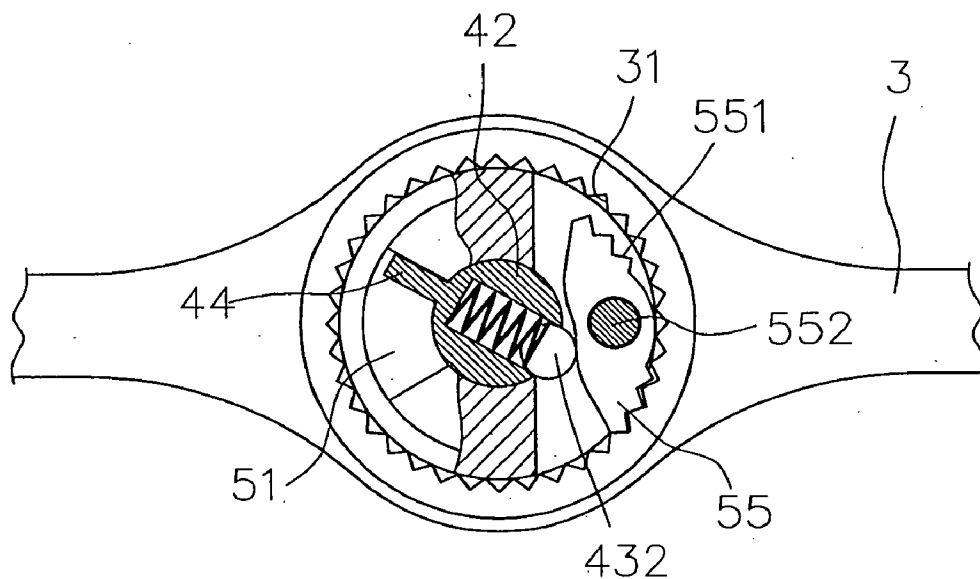


FIG. 4

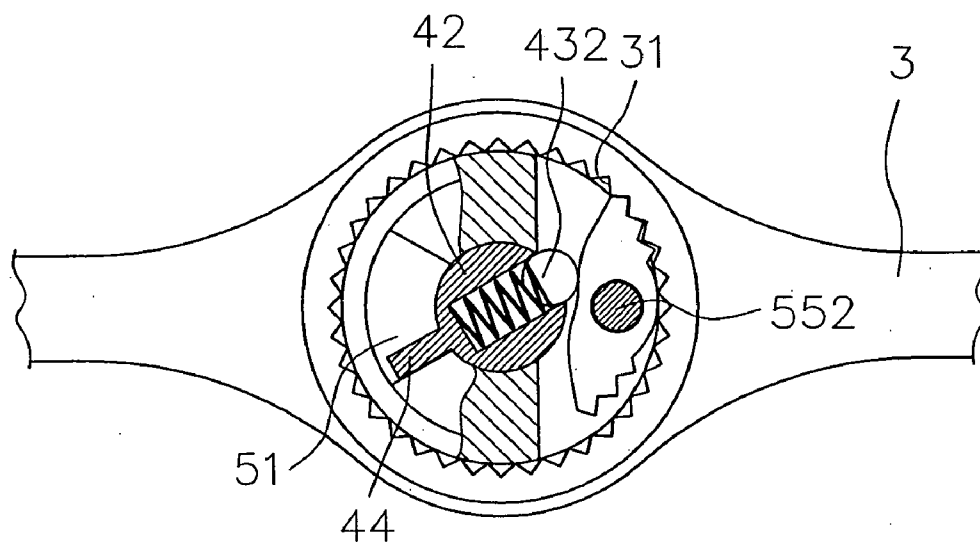


FIG. 5

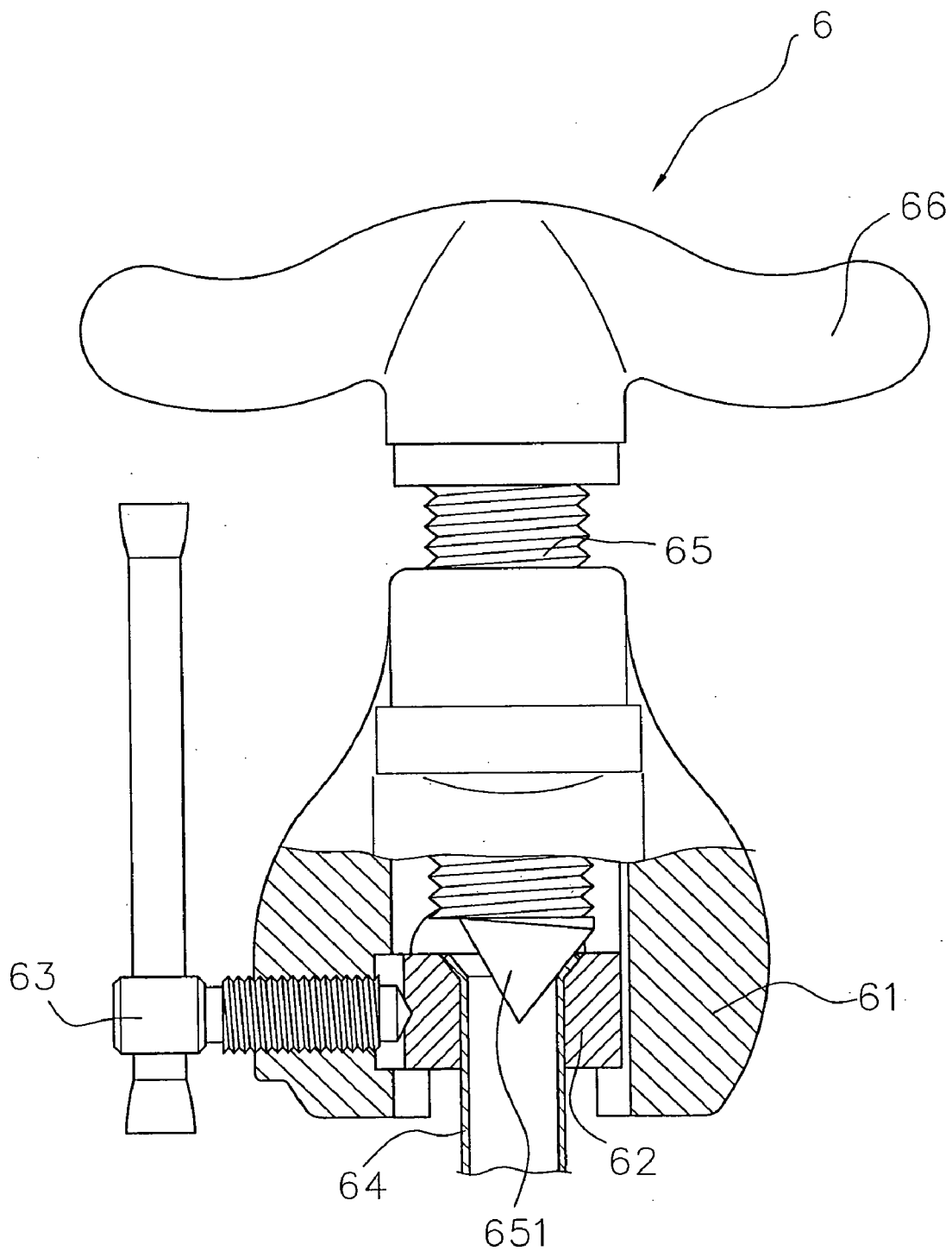


FIG. 6
PRIOR ART

RATCHET PIPE ENLARGING TOOL

FIELD OF THE INVENTION

[0001] The present invention relates to a pipe enlarging tool which includes a ratchet mechanism which allows the user to reciprocally rotate the handle within a small angles to enlarge pipes.

BACKGROUND OF THE INVENTION

[0002] A conventional pipe enlarging tool **6** is shown in **FIG. 6** and generally includes a base **61** which includes a chuck assembly **62** received in a space defined in an underside thereof and an adjusting threaded rod **63** extends through the base **61** and contacts the chuck assembly **62** so as to move the chuck assembly **62** to clamp a pipe **64**. A threaded rod **65** rotatably extends through a threaded hole in a top of the base **61** and a handle **66** is connected to a top end of the threaded rod **65**. A cone member **651** is eccentrically connected to a lower end of the threaded rod **65** so that the user may rotate the threaded rod **65** continuously to spin the cone member **651** which enlarges the opening of the pipe **651**.

[0003] However, the movement of the threaded rod **65** is made by continuously rotating the handle **66** so that it takes a lot of time to rotate the handles **66** whenever moving the cone member **651** downward to enlarge the opening of pipes **64** or moving the cone member **651** upward to remove the cone member **651** from the pipes **64**. Furthermore, if the space is not large enough for the handle **66** to rotate a whole revolution, the tool cannot be used.

[0004] The present invention intends to provide a pipe enlarging tool that includes a ratchet mechanism so that the user simply rotates the handle small angles to move the cone member up and down.

SUMMARY OF THE INVENTION

[0005] The present invention relates to a pipe enlarging tool that comprises a base having a head on a top thereof and a chuck assembly is received in a space in the base. An adjusting rod threadedly extends through a radial threaded hole in the base and contacts the chuck assembly. A first threaded rod extends into the base. A top plate is connected to a top end of the first threaded rod. A second threaded rod threadedly extends through a threaded passage defined axially in the first threaded rod and a cone member is eccentrically connected to a lower end of the second threaded rod.

[0006] A ratchet mechanism includes a handle, a cap and a knob. The cap is rested on the top plate and fixedly connected to the second threaded rod. The cap has a central passage and a slot is defined radially through a wall of the cap and communicates with the central passage. A ratchet is pivotably retained in the slot and has two toothed ends. The handle has a hole so as to be rotatably mounted to the cap and a toothed inner periphery is defined in an inner periphery of the hole of the handle. The knob is rotatably engaged with the hole in the handle and has a post which extends into the central passage. A stopper is connected to a lower end of the post to prevent the post from disengaging from the cap. A first positioning assembly is received in a recess in the post and biases the ratchet to push one of the two toothed ends to engage with the toothed inner periphery of the handle.

[0007] The primary object of the present invention is to provide a pipe enlarging tool wherein the cone member can be moved to enlarge the pipe or to be removed from the pipe by reciprocally operating the handle by a ratchet mechanism.

[0008] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] **FIG. 1** is an exploded view to show the pipe enlarging tool of the present invention;

[0010] **FIG. 2** is a perspective view to show the pipe enlarging tool of the present invention;

[0011] **FIG. 3** is a cross sectional view to show the pipe enlarging tool of the present invention;

[0012] **FIGS. 4 and 5** show that the two toothed ends of the ratchet are selectively engaged with the toothed inner periphery of the handle, and

[0013] **FIG. 6** shows a conventional pipe enlarging tool.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0014] Referring to **FIGS. 1 to 3**, the pipe enlarging tool of the present invention comprises a base **1** having a head **11** on a top thereof and a space **14** is defined in an underside of the base **1**. A chuck assembly **15** is received in the space **14** and an adjusting rod **16** threadedly extends through a radial threaded hole **141** in the base **14** and contacts the chuck assembly **15** so that when operating the adjusting rod **16**, the chuck assembly **15** is moved to clamp a pipe "A" as shown in **FIG. 3**.

[0015] A first threaded rod **12** extends into the base **1** from the top of the base **1** and a lower end of the first threaded rod **12** extends into the space **14**. A top plate **120** is connected to a top end of the first threaded rod **12** and a second threaded rod **13** threadedly extends through a threaded passage **121** defined axially in the first threaded rod **12**. A notch **122** is defined in a top of the top plate **120**. A cone member **131** is eccentrically connected to a lower end of the second threaded rod **13**.

[0016] The tool includes a ratchet mechanism **2** including a handle **3**, a cap **5** and a knob **4**. The cap **5** is rested on the top plate **120** and a pin **123** extends through a pin hole **561** defined in the cap **5** and a through hole **130** defined radially through the second threaded rod **13** so as to securely connect the cap **5** and the second threaded rod **13**. The cap **5** has a central passage **54** and a slot **52** is defined radially through a wall of the cap **5** and communicates with the central passage **54**. A ratchet **55** is pivotably retained in the slot **52** by extending a pin **552** through a top hole **50** in a top of the cap **5** and a hole **550** in a center of the ratchet **55**. The ratchet **55** has two toothed ends **551**.

[0017] The handle **3** has a hole so as to be rotatably mounted to the cap **5** and a bearing **32** is engaged with the hole so that the handle **3** can be rotated relative to the cap **5**. A toothed inner periphery **31** is defined in an inner periphery of the hole of the handle **3**. The two toothed ends **551** of the

ratchet 55 are selectively to be engaged with the toothed inner periphery 31 of the handle 3.

[0018] The knob 4 is rotatably engaged with the hole in the handle 3 and has a post 42 which extends into the central passage 54. A stopper 58 is connected to a lower end of the post 42 to prevent the post 42 from disengaging from the cap 5. A recess 422 is defined radially in the post 42 and a first positioning assembly 43 is received in the recess 422. The first positioning assembly 43 biases the ratchet 55 to push one of the two toothed ends 511 to engage with the toothed inner periphery 31 of the handle 3 as shown in FIGS. 4 and 5. The first positioning assembly 43 includes a first spring 431 and a first bead 432 which partially extends out from the recess 422 and contacts the ratchet 55.

[0019] The cap 5 further has a receiving hole 562 defined in an underside thereof and a second positioning assembly 57 is received in the receiving hole 562. The second positioning assembly 57 includes a second spring 571 and a second bead 572 which is biased by the second spring 571 and partially extends out from the receiving hole 562. The second bead 572 engaged with a notch 122 defined in a top of the top plate 120. An opening 51 is defined in an outer periphery of the cap 5 and the knob 4 has a lever 44 which is movably engaged with the opening 51.

[0020] The user may shifts the lever 44 to choose one of the two toothed ends 511 to engage with the toothed inner periphery 31 of the handle 3. The engagement of each one of the two toothed ends 511 and the toothed inner periphery 31 of the handle 3 decides the direction that the rotation of the handle 3 drives the second threaded rod 13. In other words, the user simply reciprocally operates the handle 3 within a small range of angle, the cone member 131 can be quickly lifted or lowered.

[0021] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A pipe enlarging tool comprising:

a base having a head on a top thereof and a space defined in an underside of the base, a chuck assembly received in the space and an adjusting rod threadedly extending through a radial threaded hole in the base and contacting the chuck assembly;

a first threaded rod extending into the base from the top of the base and a lower end of the first threaded rod

extending into the space, a top plate connected to a top end of the first threaded rod, a second threaded rod threadedly extending through a threaded passage defined axially in the first threaded rod, a cone member eccentrically connected to a lower end of the second threaded rod, and

a ratchet mechanism including a handle, a cap and a knob, the cap rested on the top plate and fixedly connected to the second threaded rod, the cap having a central passage and a slot defined radially through a wall of the cap and communicating with the central passage, a ratchet pivotably retained in the slot and having two toothed ends, the handle having a hole so as to be rotatably mounted to the cap and a toothed inner periphery defined in an inner periphery of the hole of the handle, the knob rotatably engaged with the hole in the handle and having a post which extends into the central passage, a stopper connected to a lower end of the post to prevent the post from disengaging from the cap, a recess defined radially in the post and a first positioning assembly received in the recess, the first positioning assembly biasing the ratchet to push one of the two toothed ends to engage with the toothed inner periphery of the handle.

2. The tool as claimed in claim 1, wherein the first positioning assembly includes a first spring and a first bead which partially extends out from the recess and contacts the ratchet.

3. The tool as claimed in claim 1, wherein the cap includes a radial pin hole and a pin extends through the pin hole and a through hole defined radially through the second threaded rod.

4. The tool as claimed in claim 1, wherein the cap includes a top hole defined in a top thereof and a pin extends through the top hole and a hole in a center of the ratchet.

5. The tool as claimed in claim 1, wherein the cap has a receiving hole defined in an underside thereof and a second positioning assembly is received in the receiving hole, the second positioning assembly includes a second spring and a second bead which is biased by the second spring and partially extends out from the receiving hole, the second bead engaged with a notch defined in a top of the top plate.

6. The tool as claimed in claim 1, wherein the cap includes an opening defined in an outer periphery thereof and the knob 4 has a lever which is movably engaged with the opening.

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