April 25, 1950 J. CARNESECCA, JR 2,505,385

POWER-OPERATED PRUNING SHEARS

Filed Aug. 26, 1946

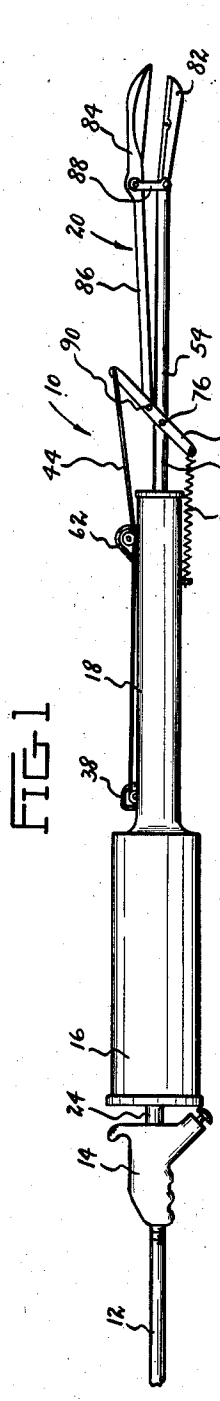


FIG 1

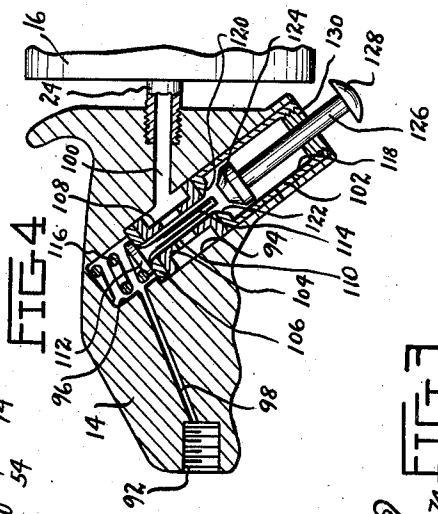


FIG 4

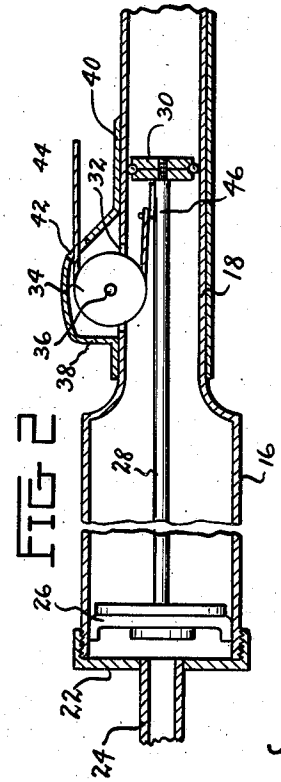


FIG 2

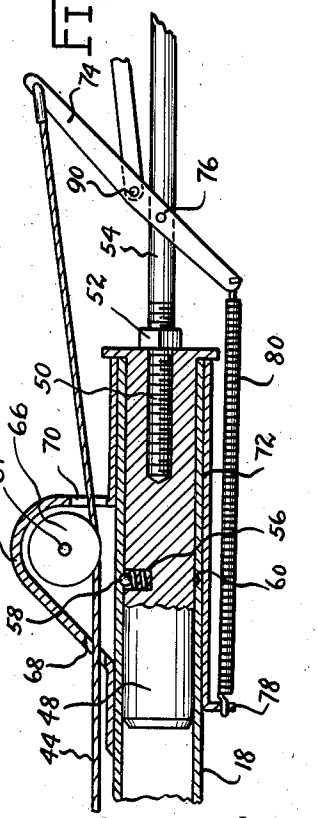


FIG 3

Inventor

Joseph Carnesecca Jr.

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Patented Apr. 25, 1950 2,505,385

UNITED STATES PATENT OFFICE

2,505,385

POWER-OPERATED PRUNING SHEARS

Joseph Carnesecca, Jr., Springville, Utah

Application August 26, 1946, Serial No. 693,112

4 Claims. (Cl. 30—228)

1

This invention pertains to a mechanical cutting device and more specifically relates to a portable power pruning shears.

It is a primary object of this invention to provide a power cutting shears for pruning or similar purposes having an improved actuating means for the shear jaws.

An important object of the invention resides in providing a power shear in accordance with the foregoing object, wherein the parts of the device may be readily assembled and detached at will.

Another object of the invention relates to the construction of a pruning shears, in accordance with the foregoing objects, which may be readily operated from a convenient power source such as a fluid pressure, by a self-contained fluid motor conveniently housed within the shear handle.

Yet another important object of the invention consists in arranging a novel and highly advantageous driving connection between the fluid motor and the jaw operating means of the shear.

Still another object of my invention includes the arrangement of a portable power shear having a novel and efficient control means for the fluid motor thereof.

These, together with various ancillary objects which will later become apparent as the following description proceeds, are realized by my invention, one embodiment of which has been illustrated by way of example only in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the device;

Figure 2 is a view in longitudinal central vertical section through a portion thereof;

Figure 3 is a view similar to Figure 2 but taken at another portion of the device; and

Figure 4 is a detail view in central longitudinal vertical section through the control valve mechanism of the fluid motor.

Referring now more specifically to the accompanying drawings, numeral 10 designates generally a portable power operated pruning shear forming a part of my invention, said device consisting generally of a pressure line 12 for supplying pressure by means of any suitable fluid medium, a valve mechanism 14 for controlling the application of the fluid pressure, a fluid pressure cylinder indicated at 16 from which extends a reduced extension forming a shaft 18 to which is removably secured as indicated generally at 20 a shear jaw mechanism.

As shown best in Figure 2, the fluid pressure cylinder 16 has its outer end merging inwardly into a cylindrical or tubular member 18 of reduced diameter relative thereto which latter member

2

constitutes an extending shaft for supporting the pruning shears. The rear end of the cylinder 16 is closed as by a cover plate 22 into which is threaded or otherwise secured a passage 24 communicating with the valve casing 14. A piston 26 of any suitable construction is reciprocably disposed in the casing 16 and is rigidly connected as by a pitman 28 of any desired length, with a guiding means 30 which is slidable within the cylindrical bore of the tube 18. A suitable slot 32 is disposed longitudinally in the wall of the tube 18 in a position adjacent to the cylinder 16, and receives a guide pulley 34 journaled as at 16 in the side walls of a housing 38 which is formed with a tubular sleeve 40 adapted to snugly embrace the tubular shaft 18. The housing 38 is provided with a slotted aperture 42 through which may extend a cable 44 entrained over the pulley 34 and attached as at 46 to the reciprocating connecting rod 28, for a purpose to be later set forth.

Attention is now directed primarily to Figure 3, wherein the outer end of the tubular shaft 18 is open and detachably receives a cylindrical plug 48 into whose outer end is detachably connected as by screw threads 50 and lock nut 52 a rod 54 which forms the shank of the rigid or stationary jaw of the pruning shears 20. The cylindrical member 48 is provided with a lateral socket or recess 56 within which is retained a spring pressed ball 58 whose outer portions protrudes from the lateral recess for detachable engagement with an annular groove 60 formed in the inner surface of the shaft 18. It will be seen that the ball 58 provides a detachable connecting means between the plug 48 and the tubular shaft 18 in order to retain these parts in operative position. A housing 62 has journaled therein as at 64 a guide pulley 66 under which is entrained the operating cable 44, the latter passing through suitably located slots 68 and 70 in the housing 62, while the housing itself merges into a sleeve 72 which snugly embraces the outer end of the tubular shaft 18. If desired, the sleeves 40 and 72 may be rigidly attached to the shaft 18 as by brazing or the like. The forward end of the cable 44 is detachably connected to an end of an operating lever 74 which is pivoted as at 76 to the rod 54 and has its opposite end connected resiliently to a boss 78 carried by the tubular shaft 18, by means of a coil spring 80.

As shown more clearly in Figure 1, the rod 54 has formed at the outer end thereof a cutting blade 82 rigidly attached thereto with which cooperates a movable cutting blade 84 having a shank 86 and which is pivotally secured for joint

operation with the blade 82 as by a link 88, the end of the shank 86 being pivoted as at 90 to the operating lever 74.

From the foregoing explanation, it will be apparent that when the cable 44 is operated, the lever 74 will be pivoted about its fulcrum 76 against the action of the spring 80, thereby reciprocating the shank 86 and causing a sliding and pivoting movement of the movable jaw 84 upon the fixed jaw 82. Upon release of pressure upon cable 44, the spring 80 will restore the parts to their normal inoperative position as shown in Figure 1. The housings 38 and 62 provide and conveniently protect guide pulleys 34 and 66 which retain the operating cable 44 in proper position upon the device. It will readily be understood that the tubular shaft 18 and the rod 54 will be formed of any desired length for the contemplated usage of the tool.

Attention is now directed to Figure 4 for an understanding of the construction and operation of the control means for the fluid pressure cylinder. The housing 14 is appropriately shaped to form a convenient width for the hand of the user, and has a threaded connection 92 for engagement by the fluid pressure line 12 at one end thereof, while the connecting conduit 24 is attached at the other end. Angularly disposed at a convenient location upon the underside of the handle 14 is a bore 94 which terminates in a diametrically reduced portion forming a shoulder therebetween. A fluid pressure inlet passage 98 establishes communication between the reduced bore 96 and the fluid pressure inlet coupling 92. A similar passage 100 connects the conduit 24 with the interior of the bore 94 adjacent its midpoint, while an aperture 102 constitutes a vent between the lower end of the bore 94 and the atmosphere. A tubular bushing 104, having a valve seat 106 is seated against the shoulder between the bores 94 and 96 and is provided with an annular external groove 108 which is in registry with the conduit 100 and is radially apertured at 110 for communication with the interior of the tubular bushing 104. A poppet type of valve 112 is adapted to selectively engage the seat 106 and has its stem 114 extending through the bore of the tubular bushing 104 and protruding from below the end thereof for a purpose to be now set forth. The valve is normally urged to its seat by the spring 116 seating thereon and against the inner end of the reduced bore 96. The bushing 104 is retained against its seat, by the hollow cylindrical sleeve 118 which fits snugly within the bore 94 and has its upper end flanged as at 120 for abutting engagement with the lower surface of the tubular bushing 104 and is axially apertured to form a valve seat 122 through which the valve stem 114 extends and which seat 122 is engageable by a valve 124 carried upon an operating stem 126. The stem 126 is provided with a push button operating means 128 and is slidable in guided relation through a closure plug 130 which screw threadedly engages the inner end of the cylindrical member 118.

The operation of the foregoing mechanism is as follows. When the push button 128 is depressed, the valve 124 is urged to its seat 122 closing the latter and preventing the flow of pressure fluid to the vent 102 and at the same time raising the valve stem 114 and opening the valve 112 against the action of the closing spring 116, whereby fluid pressure may flow from the line 12 through the connection 92, thence by passage 98 to the interior of the tubular bushing 104, and from thence by apertures 110 and passage 100 into the conduit 24 and into the fluid pressure cylinder 16 below the piston 26. The fluid pressure then urges piston 26 outwardly, and the ensuing actuation of cable 44 manipulates the pruning shears in the manner set forth hereinbefore. When the push button 128 is released, the spring 116 closes valve 112 cutting off the connection with the source of fluid pressure, and the depending end of stem 114 opens valve 124, whereby the fluid trapped in the pressure chamber 16 may escape by way of conduit 24, passage 100, radial ports 110 and vent 102 to the atmosphere.

From the foregoing, it will be seen that I have provided a portable, power operated, pruning shears which has an efficient and powerful cutting action, and wherein the various ports may be readily disassembled for repair or for portability.

It will be obvious to those skilled in the art to which my invention relates, that various modifications and adaptations of the principles of this invention may be readily effected, and consequently I do not limit myself to the exact construction shown and described, but may avail myself of all equivalent embodiments falling within the scope of the appended claims.

I claim as my invention:

1. A power actuated pruning shears including a fluid pressure cylinder constituting a shaft, a fixed blade extending from said shaft, a movable blade supported for pivotal and sliding movement upon said fixed blade, an actuating lever pivoted intermediate its ends to said fixed and movable blades, a fluid operated piston reciprocable in said cylinder, a cable connecting said piston with said actuating lever, and a control valve selectively controlling the flow of pressure fluid to and from said cylinder, a slot in said shaft, a housing covering said slot, a guide pulley in said housing extending into said slot, said cable being entrained over said pulley and being exterior to said shaft.

2. A power actuated pruning shears including a fluid pressure cylinder constituting a shaft, a fixed blade extending from said shaft, a movable blade supported for pivotal and sliding movement upon said fixed blade, an actuating lever pivoted intermediate its ends to said fixed and movable blades, a fluid operated piston reciprocable in said cylinder, a cable connecting said piston with said actuating lever, and a control valve selectively controlling the flow of pressure fluid to and from said cylinder, said piston having a guide connected thereto and reciprocable in a portion of said cylinder, said portion being open at its outer end and a cylindrical plug being detachably seated therein, said plug detachably carrying said fixed blade, said plug being laterally socketed to retain a protruding spring pressed ball therein, and a recess in said portion to receive the outer surface of said ball.

3. A power actuated pruning shears including a fluid pressure cylinder constituting a shaft, a fixed blade extending from said shaft, a movable blade supported for pivotal and sliding movement upon said fixed blade, an actuating lever pivoted intermediate its ends to said fixed and movable blades, a fluid operated piston reciprocable in said cylinder, a cable connecting said piston with said actuating lever, and a control valve selectively controlling the flow of pressure fluid to and from said cylinder, said piston having a guide connected thereto and reciprocable in

a portion of said cylinder, said portion having a slot therein, a guide pulley extending into said slot, a second guide pulley journaled on said shaft adjacent its outer end, said cable being entrained over both said pulleys, said first pulley being journalled in a housing, said housing being provided with a sleeve slidably embracing said portion.

4. A power actuated pruning shears including a fluid pressure cylinder constituting a shaft, a fixed blade extending from said shaft, a movable blade supported for pivotal and sliding movement upon said fixed blade, an actuating lever pivoted intermediate its ends to said fixed and movable blades, a fluid operated piston reciprocable in said cylinder, a cable connecting said piston with said actuating lever, and a control valve selectively controlling the flow of pressure fluid to and from said cylinder, said piston having a guide connected thereto and reciprocable in a portion of said cylinder, said portion being open at its outer end and a cylindrical plug being

detachably seated therein, said plug detachably carrying said fixed blade, said plug being laterally socketed to retain a protruding spring pressed ball therein, a recess in said portion to receive the outer surface of said ball, a sleeve embracing the outer end of said portion, a cable guide pulley rotatably carried by said sleeve, and a housing for said pulley having open slots through which said cable extends.

JOSEPH CARNESECCA, JR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,235,564	Rieff	Mar. 18, 1941
2,262,645	Newman	Nov. 11, 1941
2,366,909	Johnson	Jan. 9, 1945
2,391,676	Browning	Dec. 25, 1945