Sept. 25, 1945. F. A. MATULICH 2,385,419

HYDRAULIC PRUNING TOOL

Filed Oct. 13, 1944

Fig. 1

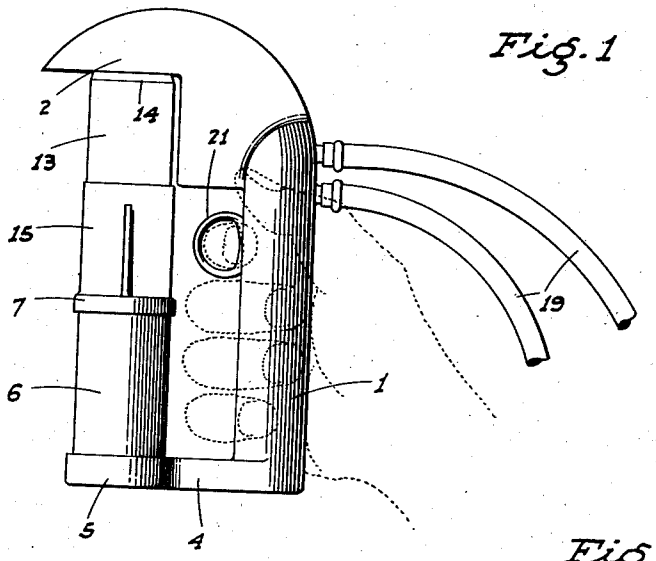


Fig. 2

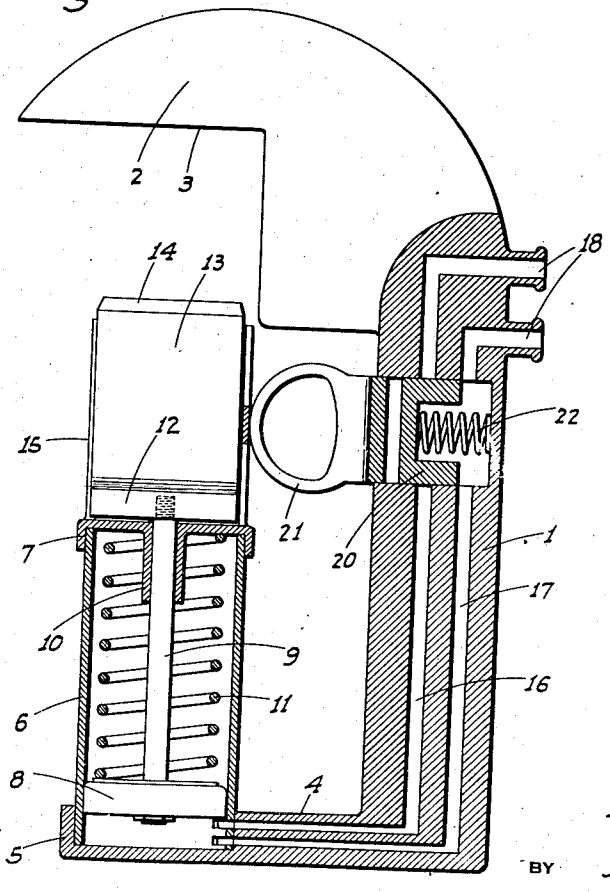
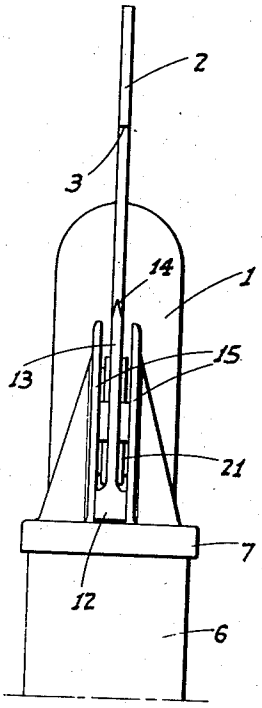


Fig. 3



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HYDRAULIC PRUNING TOOL

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Application October 13, 1944, Serial No. 558,591

7 Claims. (Cl. 30—180)

This invention relates in general to an improved pruning tool, and particularly for use in vineyards; the invention being directed in particular, and it is an object to provide, a pruning tool which is hand manipulated but power actuated by fluid pressure.

Another object of this invention is to provide a hand supported, fluid pressure power actuated pruning tool which comprises, in combination with a handle, a fixed blade and a cooperating movable blade, a power cylinder arranged to actuate the blade, and a fluid pressure supply system connected with the cylinder and including a control valve and a trigger adjacent the handle to operate the valve.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

Figure 1 is a side elevation of the pruning tool in use.

Figure 2 is an enlarged side elevation partly in section.

Figure 3 is a fragmentary front elevation of the tool.

Referring now more particularly to the characters of reference on the drawing, the tool comprises a hand grip or handle 1 fitted at one end with a forwardly projecting blade 2, said blade including a substantially square edge 3 disposed at right angles to the handle 1 and facing toward its opposite end.

At said opposite end the handle 1 includes a forwardly projecting leg 4 whose outer end is enlarged to provide a circular base 5 disposed at right angles to the handle 1 and facing the edge 3 of blade 2.

A cylinder 6 is fixed to the base 5 and projects toward the blade 2, such cylinder including, at its free end, a cylinder head 7. A piston 8 is slidable in the cylinder 6 and includes a piston rod 9 which extends through a guide sleeve 10 on the head 7; said rod terminating at its free end outwardly of the cylinder. A compression spring 11 surrounds the piston rod 9 in the cylinder and is engaged between the head 7 and piston 8; such spring acting to retract the piston.

At its outer end the piston rod 9 is secured to the base 12 of a flat knife blade 13 whose outer edge is sharpened as at 14, and which outer edge lies parallel to and is alined with the edge 3 of blade 2 for cooperative engagement with the same. The base 12 of knife blade 13 is guided between spaced upstanding guide plates 15 secured on the cylinder head 7.

Fluid pressure is supplied to and vented from the cylinder 6 beyond the piston 8 by means of a supply conduit 16 and a return conduit 17, which conduits are formed in the handle 1 and leg 4 of the tool. At the outer end of the leg 4 the conduits 16 and 17 lead into the cylinder 6, while at the opposite end of the handle 1 said conduits terminate in fittings, indicated generally at 18. The fittings 18 are adapted for connection with flexible tubes 19 which lead to a source of fluid pressure, preferably hydraulic. It is intended that this source of fluid pressure shall be carried and actuated by the worker, and preferably will comprise a device embodying the invention of my co-pending application for U. S. Letters Patent on "Foot-actuated pressure generator," Serial No. 558,592, filed October 13, 1944.

Flow of fluid pressure to and from the cylinder 6, and through the conduits 16 and 17, is selectively controlled by the operator by means of a relatively small piston valve 20 associated with the handle 1; said valve being exposed to the front of the handle adjacent one end thereof and including a finger loop or trigger 21 through which the operator's index finger is adapted to engage. The valve 20 is arranged so that only the conduit 16 or conduit 17 is open at one time, and is normally advanced by a spring 22 so that conduit 17 is normally open, and at which time the piston 8 is retracted and with the tool blades apart.

In use, a twig to be cut is engaged between the blades 2 and 13, and the operator then depresses the valve 20 by the trigger 21, closing conduit 17 and opening conduit 16. When this occurs fluid pressure surges into the cylinder 6 and advances the piston 8, causing the blade 13 to rapidly advance into cutting engagement with the twig. When the operator releases the trigger 21 the conduit 16 is closed, the conduit 17 is open, and the spring 11 immediately retracts the piston 8 and blade 13 to starting position, and preparatory to a further cutting operation.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a de-

parture from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A portable hand supported pruning tool comprising a handle, a fixed blade mounted in connection with and projecting laterally from the handle adjacent one end thereof, a fixed leg projecting in the same direction from the handle adjacent its other end, a fluid pressure actuated power cylinder mounted on the leg in spaced relation to the handle extending axially toward but terminating short of the fixed blade, said cylinder including a piston and projecting from the end adjacent the fixed blade, another blade secured on the outer end of the rod adapted to cooperate with said fixed blade, and manually actuated means to control operation of the power cylinder.

2. A tool as in claim 1 in which the piston rod is normally spring retracted and said other blade normally clear of the fixed blade.

3. A portable, hand supported pruning tool comprising a handle, a fixed blade mounted in connection with and projecting laterally from the handle adjacent one end thereof, a fixed leg projecting in the same direction from the handle adjacent its other end, a fluid pressure actuated power cylinder mounted on the leg in spaced relation to the handle and extending axially toward but terminating short of the fixed blade, said cylinder including a piston and projecting from the end adjacent the fixed blade, another blade secured on the outer end of the rod adapted to cooperate with said fixed blade, and manually actuated means to control operation of the power cylinder; the cylinder including a head adjacent said other blade, and a pair of guide plates secured on the head parallel to the piston rod extending on opposite sides of said other blade in guiding relation thereto, said guide plates terminating short of the fixed blade.

4. A portable hand supported pruning tool comprising a handle, a fixed blade mounted in connection with and projecting laterally from the handle adjacent one end thereof, a fixed leg projecting in the same direction from the handle adjacent its other end, a fluid pressure actuated power cylinder mounted on the leg in spaced relation to the handle extending axially toward but terminating short of the fixed blade, said cylinder including a piston and projecting from the end adjacent the fixed blade, another blade secured on the outer end of the rod adapted to cooperate with said fixed blade, and manually actuated means to control operation of the power cylinder; said manually actuated control means including a valve mounted in connection with the handle, and a valve operating trigger disposed adjacent said handle for finger engagement.

5. A portable, hand supported pruning tool comprising a handle, a fixed blade projecting laterally from adjacent one end of the handle, a fixed leg projecting laterally in the same direction from adjacent the other end of the handle, a fluid pressure actuated power cylinder mounted on the outer end portion of the handle substantially parallel to but spaced therefrom, said cylinder terminating at its free end some distance from the fixed blade and including a piston rod projecting from said end, another blade mounted on the projecting end of the piston rod in position for cooperation with the fixed blade upon advance of the rod, the rod being normally retracted and said other blade then being clear of the fixed blade, and manually actuated means to control operation of the power cylinder.

6. A portable, hand supported pruning tool comprising a handle, a fixed blade propecting laterally from adjacent one end of the handle, a fixed leg projecting laterally in the same direction from adjacent the other end of the handle, a fluid pressure actuated power cylinder mounted on the outer end portion of the handle substantially parallel to but spaced therefrom, said cylinder terminating at its free end some distance from the fixed blade and including a piston rod projecting from said end, another blade mounted on the projecting end of the piston rod in position for cooperation with the fixed blade upon advance of the rod, the rod being normally retracted and said other blade then being clear of the fixed blade, and manually actuated means to control operation of the power cylinder; the handle of said leg including a passage system therethrough in communication with the power cylinder, a valve mounted in the handle operative to selectively control flow to and from said cylinder, and means to introduce fluid pressure into said system.

7. A tool as in claim 6 in which the valve is slidable substantially radially of the handle adjacent said one end thereof, and in a direction toward the power cylinder, and an exposed trigger on the valve operative by one finger of the hand which grasps the handle.

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