May 29, 1945. W. N. HADLEY 2,377,146

LUBRICATING SYSTEM FOR CLOTH SHEARING MACHINES

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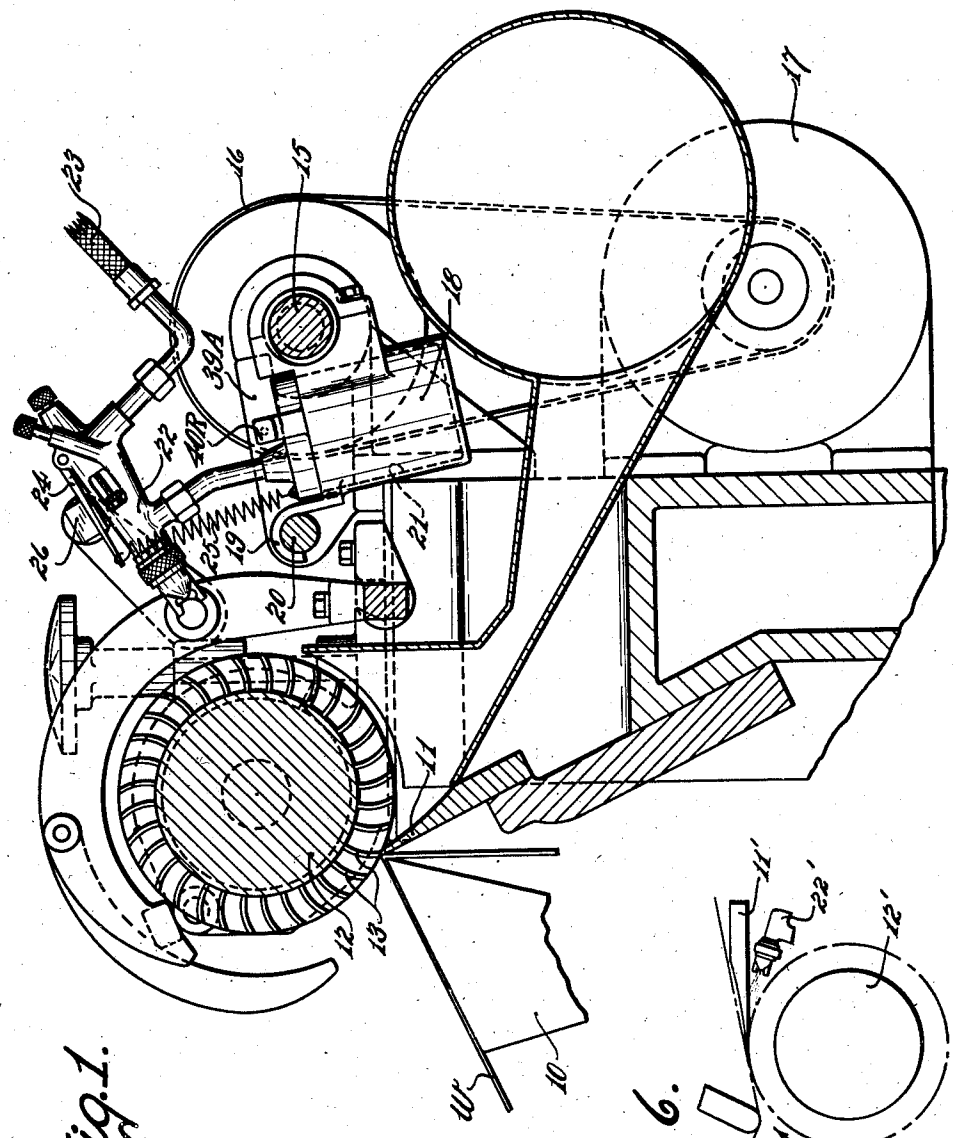


Fig. 1.

Fig. 6.

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Fig. 2.

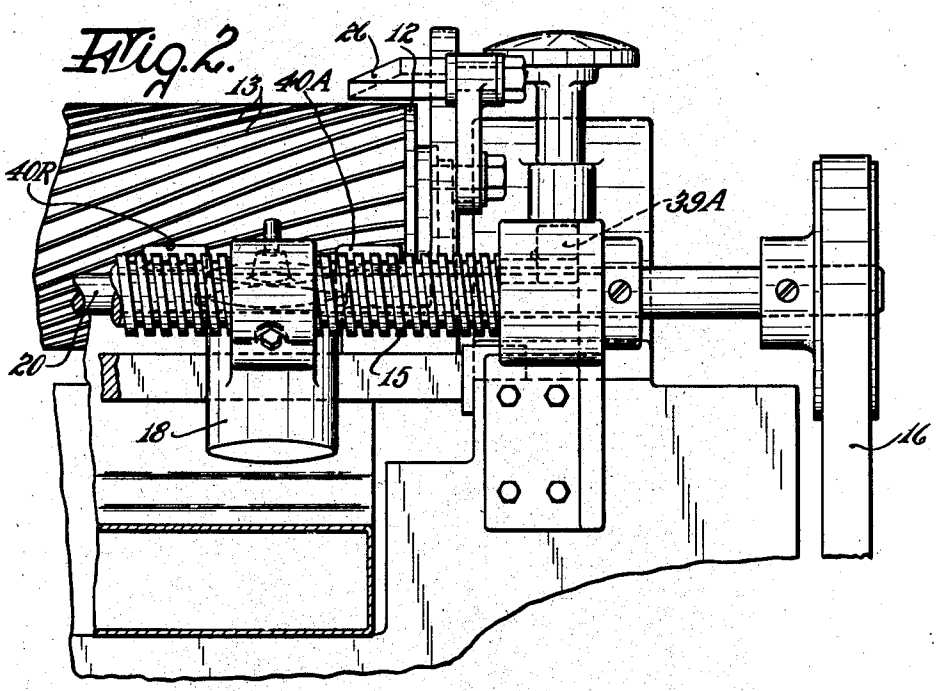
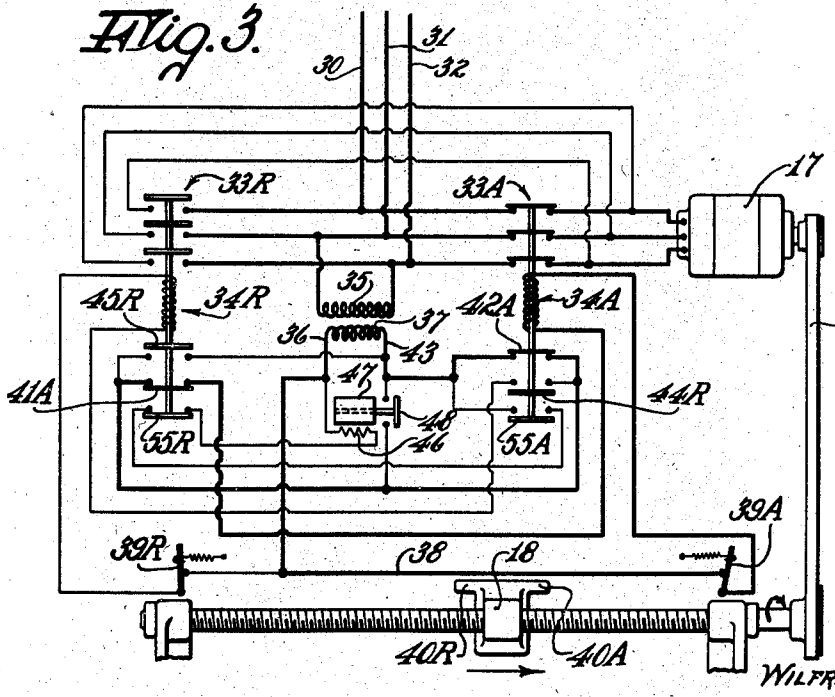


Fig. 3.



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Fig. 4.

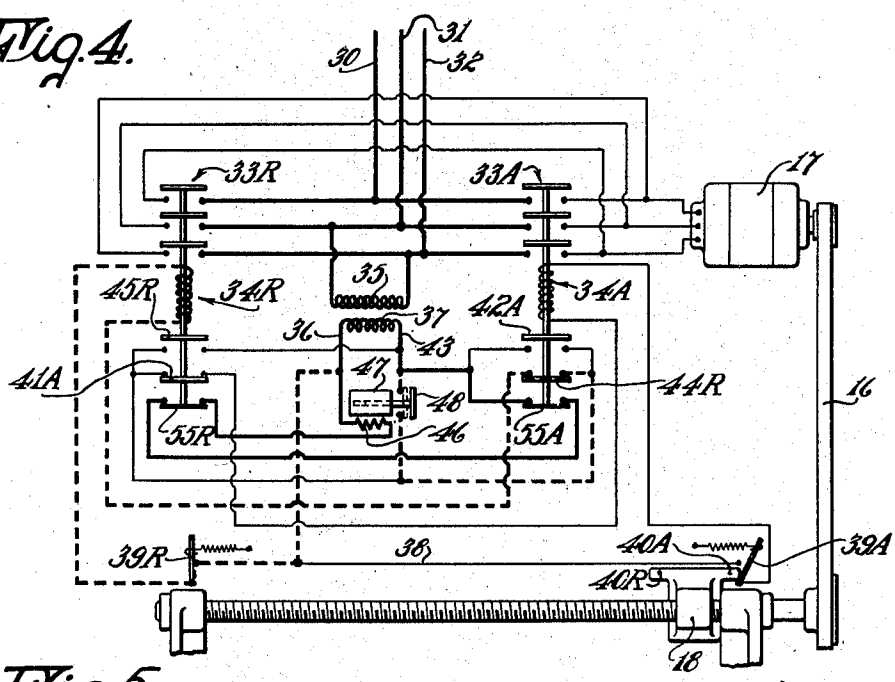
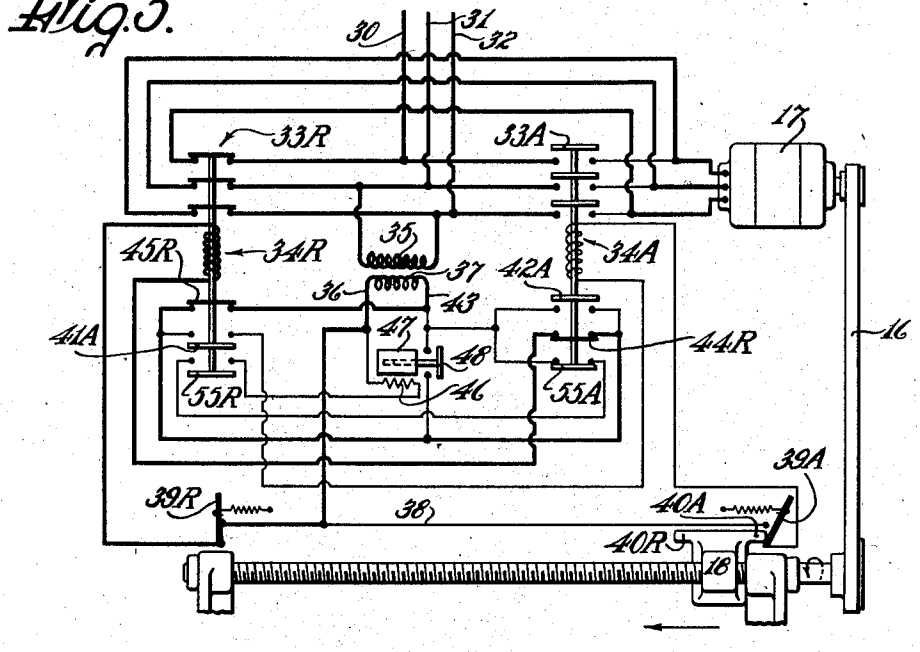


Fig. 5.



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LUBRICATING SYSTEM FOR CLOTH SHEARING MACHINES

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Application February 9, 1944, Serial No. 521,641

12 Claims. (Cl. 26—15)

This invention relates to cloth shearing machines, and in particular to improvements in lubricating devices for the cutting blades. The shearing of the surface of cloth is accomplished by drawing the cloth over a straight edge, or cloth rest, in close proximity to a stationary cutter member called a ledger blade. A rotating cutter member in the form of a multi-bladed knife, the blades of which are generally helical in form, is revolved so that its blades move past the end of the ledger blade and shear off any fibers projecting more than the desired amount. The friction of the revolving cutters against the ledger blade is sufficient to absorb considerable power and to cause heating to the point where the temper of the cutting edge of the ledger blade would be drawn were the surfaces not kept oiled. It is customary to lubricate the revolving cutter by allowing it to run in light contact with an oil-soaked felt or swab. These swabs are neither uniform nor positive in operation and many unsuccessful attempts have been made to provide an automatic oiling system giving better control of the oil supplied to the rotating blade.

In accordance with my invention the oil is supplied to one or both of the cutter members, preferably the rotating shear blades, in atomized form preferably by a spray head traversed periodically either from one end of the cutter members to the other or to the extent found desirable. Preferably, also, automatic control means is provided so that the traverse or shift occurs at regular intervals which may be adjusted as desired.

The invention will now be described in connection with the accompanying drawings, which show the preferred but not the only way of embodying it in practical form, and in which

Fig. 1 is a section through a cloth shear showing the mounting of the spray head;

Fig. 2 is a fragmentary elevation looking from the right in Fig. 1 with much of the spray head itself omitted;

Figs. 3, 4, and 5 are electrical wiring diagrams showing different circuit conditions for one form of control means; and

Fig. 6 is a diagrammatic showing of a modification.

The cloth web *w* is led at a sharp angle over the cloth rest 10 in close adjacency to the cutting end of the stationary cutter member or ledger blade 11. A revolving cutter member, generally called a revolver 12, carries a series of helical fly blades 13 passing in close contact with the ledger blade. The drive and adjustment of these parts are not necessary for an understanding of the present invention and will not be described.

Running across the machine parallel to the axis of the revolver is a suitable carrier such as a screw, which may be driven by any suitable power source. For purposes of illustration, I have shown a screw threaded shaft 15 mounted in suitable bearings and driven as by a belt 16 from a motor 17, here shown as of the reversible three-phase type. A spray head 18 is threaded to shaft 15 and carries a positioning bearing 19 resting on a transverse rod 20 so that it cannot rotate with shaft 15 but can progress along it. The spray head carries an oil container 21 from which arises an atomizer 22 here shown as of a standard commercial De Vilbiss type receiving compressed air through a hose 23. Any form of sprayer or atomizer may be used, and since the details of the one chosen for illustration form no part of the invention it will not be described in detail. The atomizer may be positioned to direct the oil spray against either cutter member, but is preferably positioned adjacent the revolver 12. However, as shown in Fig. 6, representing the adaptation of the invention to another standard form of shear, the atomizer 22' may direct the oil against the lower side of the ledger blade 11' instead of against the revolver 12'. The usual manual control handle, by the depression of which the atomizer is put into operation, is here replaced by a handle 24 normally held down by a spring 25 and adapted to be raised at either end of its traverse by contact with a stationary cam 26. It will be seen that if the motor 17 is started in the proper direction the shaft 15 will be revolved and spray head will be caused to progress from one side of the machine to the other. As soon as the spray head leaves its initial position the handle 24 will disengage the cam 26 and will be drawn down by spring 25 to start operation of the atomizer. When the spray head reaches the opposite side of the machine, the cam 26 at that side will again raise the handle to stop the flow of atomized oil.

While the motor may be manually controlled to cause the spray head to be moved from one side to the other, or otherwise shifted, as desired, it is preferable to provide automatic means whereby this will be done without dependence upon the constant watchfulness of an attendant. I prefer to use wholly electrical mechanism of generally standard type as shown in Figs. 3, 4 and 5. A three-phase line 30, 31, 32 is directed to the motor 17 alternatively through a pair of triple

contactors 33A and 33R, it being apparent that the connection of wires 30 and 32 to the motor will be reversed depending upon which contactor is being used. Contactors 33A and 33R are actuated respectively by solenoids 34A and 34R. The primary 35 of a transformer is connected across wires 31, 32, and one end 36 of the secondary 37 to a line 38 joining limit switches 39A and 39R actuated by abutments 40A and 40R on the spray head 18. Switch 39A is connected through solenoid 34A, a contactor 41A actuated by solenoid 34R, and a contactor 42A actuated by solenoid 34A back to the second end 43 of the transformer secondary 37. Switch 39R is connected through solenoid 34R, a contactor 44R actuated by solenoid 34A and a contactor 45R actuated by solenoid 34R back to the end 43 of the transformer secondary 37. There are connections between the points of contactors 41A, 45R and 42A, 44R as shown. The activating coil 46 of a time delay mechanism 47, which may be either of the heater or the motor type, is connected between ends 36 and 43 of the transformer secondary through contactors 55A and 55R actuated by solenoids 34A and 34R respectively. A predetermined time after the activation of coil 46 a timer contactor 48 will be closed momentarily, producing a current through either solenoid 34A or 34R depending upon whether limit switch 39A or 39R is open at the moment.

In Fig. 3 the spray head is traveling towards limit switch 39A. At this time current is flowing through that switch and contactors 41A and 42A to energize solenoid 34A and hold its controlled contactors in the positions shown. Solenoid 34R is not energized. As soon as limit switch 39A is actuated by abutment 40A the circuit through solenoid 34A will be broken, both solenoids then being de-energized, and the current conditions will be as shown in full lines in Fig. 4. The motor stops. Contactors 55A and 55R being both closed, current flows through the timer activating coil 46 and starts the operation of the time delay mechanism. As soon as this closes contactor 48 a momentary current flows as indicated by the dotted lines, causing energization of solenoid 34R through contactor 44R and limit switch 39R. As the contractors controlled by this solenoid are shifted, the circuit through it is made through contactor 45R as in Fig. 5 and at the same time the current through coil 46 is broken by contactor 55R, the contactor 48 released, and the timer automatically reset by the mechanism common to such standard devices. The motor will then start in the reverse direction, carrying the spray head across the machine rearwardly. A similar action will occur at the other end of the machine except that the role of the limit switches will be interchanged.

It will be seen that, depending upon the setting of the time delay mechanism, the spray head will halt at each end of the machine for a predetermined period, and will then perform a traverse across the machine at a constant speed. During its rest periods no oil will be discharged due to the action of cams 26, but delivery of atomized oil will start as soon as the spray head moves away from its cam. As it travels, the atomizing device will bathe the rotating shear blades in a light mist of oil, lubricating them to the extent determined, and leaving a sufficient deposit of oil so that the blades will remain sufficiently lubricated until the next traverse of the spray head.

What I claim is:

1. In a cloth shearing machine, a fixed cutter member, a revolving cutter member, means mounted on the machine for spraying oil against one of said members, and mechanically actuated means for shifting the spraying means longitudinally of the cutter members.

2. In a cloth shearing machine of the type having a fixed cutter member and a revolving cutter member, means for spraying oil against one of said members, means for shifting the spraying means longitudinally of the cutter members, and means inhibiting operation of the spraying means when the latter is at rest.

3. In a cloth shearing machine of the type having a fixed cutter member and a revolving cutter member, a support for an oil spraying means, means for shifting said support longitudinally of the cutter members, and means to control said support shifting means.

4. In a cloth shearing machine of the type having a fixed cutter member and a revolving cutter member, an oil spray head, means for traversing the spray head along the cutter members from one end to the other in successively opposite directions, and means for causing the spray head to discharge oil against one of the cutter members during its movement.

5. In a cloth shearing machine of the type having a fixed cutter member and a revolving cutter member, an oil spray head, means for traversing the spray head along the cutter members from one end to the other in successively opposite directions, means for causing a predetermined dwell of the spray head at each end of its traverse, and means for causing the spray head to discharge oil against one of the cutter members during its movement.

6. In a cloth shearing machine of the type having a fixed ledger blade and a revolving series of cutter blades, a screw shaft mounted parallel to the axis of the rotating blades, a spray head threaded upon the shaft, means for guiding the spray head for travel along the shaft, and means for rotating the screw shaft periodically in opposite directions.

7. In a cloth shearing machine of the type having a fixed ledger blade and a revolving series of cutter blades, a screw shaft mounted parallel to the axis of the rotating blades, a spray head threaded upon the shaft, means for guiding the spray head for travel along the shaft, means for rotating the screw shaft periodically in opposite directions, and means for causing a predetermined dwell of the spray head at each end of its traverse.

8. In a cloth shearing machine of the type having a fixed ledger blade and a revolving series of cutter blades, a screw shaft mounted parallel to the axis of the rotating blades, a spray head threaded upon the shaft, means for guiding the spray head for travel along the shaft, means for rotating the screw shaft periodically in opposite directions, means for causing a predetermined dwell of the spray head at each end of its traverse, and means inhibiting operation of the spray head during its periods of rest at the ends of its traverse.

9. A blade oiling device for cloth shearing machines of the type having a fixed cutter member and a revolving cutter member which comprises; means for spraying oil against one of the cutter members, means to shift the spraying means longitudially with respect to the cutter members, means to interrupt the travel of the spraying means, and means inhibiting discharge of the oil except when the spraying means is in motion.

10. A blade oiling device for cloth shearing machines of the type having a fixed cutter member and a revolving cutter member which comprises; means for spraying oil against one of the cutter members, means for shifting the spraying means longitudinally of the cutter members from one end to the other, means for periodically causing a predetermined dwell of the spraying means at each end of its traverse, and means inhibiting operation of the spraying means during said periods of dwell.

11. A blade oiling device for cloth shearing machines of the type having a fixed ledger blade and a revolving series of cutter blades, which comprises; a screw threaded shaft adapted to be mounted in parallel relation with the axis of the rotating blades of the shearing machine, a spray head threaded on the shaft, means for guiding the spray head for travel along the shaft, and means for rotating the screw shaft successively in opposite directions to cause the spray head to travel back and forth along the shaft.

12. A blade oiling device for cloth shearing machines of the type having a fixed ledger blade and a revolving series of cutter blades, which comprises; a screw threaded shaft adapted to be mounted in parallel relation with the axis of the rotating blades of the shearing machine, a spray head threaded on the shaft, means for guiding the spray head for travel along the shaft, means for rotating the screw shaft successively in opposite directions to cause the spray head to travel back and forth along the shaft, means to periodically stop the rotating of the shaft, and means to inhibit operation of the spraying head when the latter is at rest.

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