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R. K. HUTCHINS

WIRE POLISHING MACHINE

Filed Aug. 17, 1922

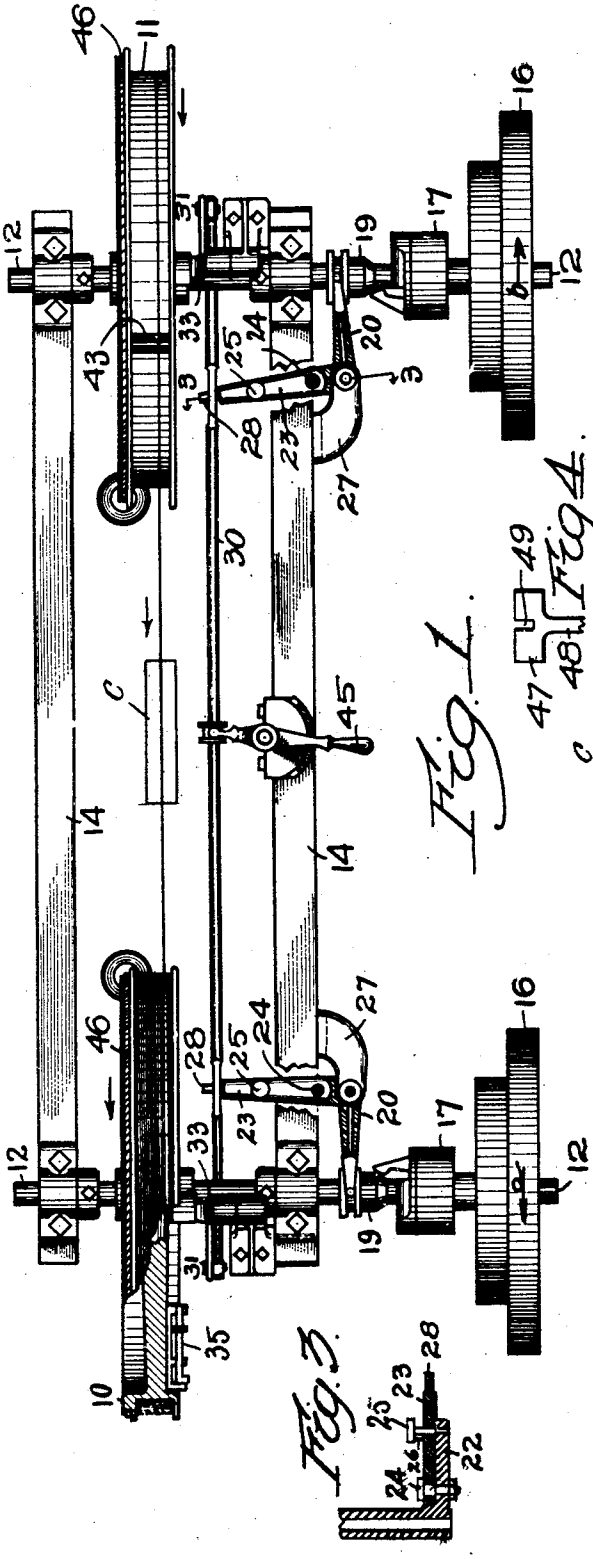


Fig. 1.

Fig. 4.

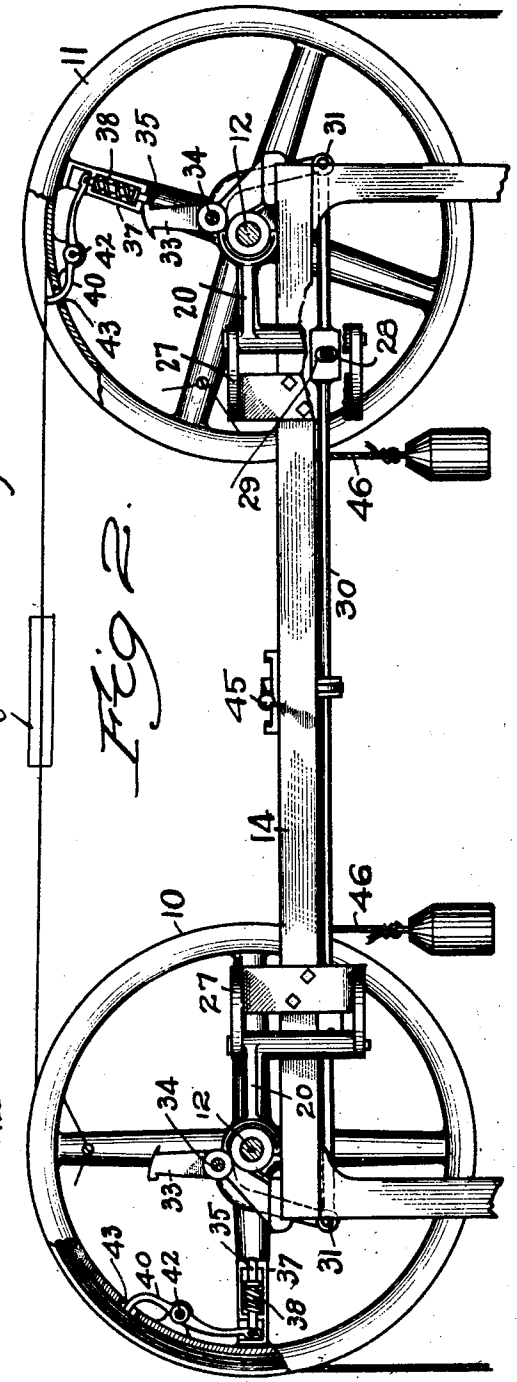


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

RICHARD K. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE WHITAKER REED COMPANY, A CORPORATION OF MASSACHUSETTS.

WIRE-POLISHING MACHINE.

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To all whom it may concern:

Be it known that I, RICHARD K. HUTCHINS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Wire-Polishing Machine, of which the following is a specification.

This invention relates to a wire polishing machine and particularly to a combined reversing mechanism and stop motion therefor. In the process of polishing wire, it is customary to place the wire on two winding drums and to draw the wire alternately from one drum to the other past the polishing devices.

It is the object of my invention to provide mechanism by which the direction of travel of the wire may be automatically reversed when the wire on a given drum is substantially exhausted.

A further object of my invention is to provide mechanism of this character which may also be set to stop the machine when desired, instead of reversing the direction of movement thereof.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a plan view of my improved mechanism, the polishing device being shown diagrammatically;

Fig. 2 is a front elevation thereof with the polishing device shown diagrammatically;

Fig. 3 is a detail sectional view taken along the line 3—3 in Fig. 1; and

Fig. 4 is a detail view of a slight modification.

Referring to the drawings, I have shown parts of a wire polishing machine comprising a pair of winding drums 10 and 11 mounted on driving shafts 12 rotatable in fixed bearings on a frame 14. Driving pulleys 16 are loosely rotatable upon the shafts 12 and are continuously rotated in opposite directions as indicated by the arrows *a* and *b* in Fig. 1. Friction clutches 17 are provided for selectively connecting the driving pulleys to the shafts upon which they are mounted. The pulleys 16 may be continuously rotated by driving belts, not shown, or in any other convenient manner.

Clutch sleeves 19 are slidable on the shafts 12 and are controlled in position by bell crank levers 20. One arm of each lever is forked to engage the corresponding clutch sleeve and the other arm of each lever is formed in two parts 22 and 23, as shown in Fig. 3. The part 23 is pivoted at 24 to the arm 22 and may also be locked to the arm 22 by a removable stud 25. Each stud 25 has a pin 26 in one side of the head fitting a recess in the lever when in one position and engaging the lever to hold the stud raised when in any other position.

The levers 20 are mounted upon fixed brackets 27 on the frame 14 and the outer ends 28 of the lever arm portions 23 extend through slots 29 (Fig. 2) in a cross rod 30. The opposite ends of the rod 30 are pivotally connected at 31 to the depending arms of reversing levers 33 mounted on fixed pivots 34.

The upper portion of each reversing lever 33 projects into the path of travel of a plunger 35 when the plunger is in inward or operative position. These plungers are slidable in bearings 37 preferably mounted on arms of the drums 10 and 11 and are provided with coil springs 38 adapted to press the plungers yieldingly inward. The outer end of each plunger engages an arm of a detecting lever 40 pivoted at 42 on one of the drums 10 and 11.

The free end of each lever 40 is curved outwardly, as shown in Fig. 2, and extends through a slot 43 in the corresponding drum. The slots extend across the full width of the winding face of each drum and the outwardly curved portion of each lever 40 is correspondingly widened to engage a strand of wire on any portion of the face of the drum.

The operation of the mechanism thus far described is as follows:

Assuming that the parts are in the position shown in Figs. 1 and 2, the coil of wire has just been drawn to the left and wound on the drum 10 so that there is less than a single turn of wire left on the drum 11. This uncovers the slot 43, permitting the curved end of the lever 40 to move up-

ward through the slot, and allowing the spring 38 to project the plunger 35 into position to engage the head of the reverse lever 33. The parts as shown in the drawing are in this exact position.

Continued rotation of the drum 11 will cause the plunger 35 to swing the lever 33 upon its pivot 34, drawing the cross rod 30 to the right and thereby disengaging one clutch 17 and simultaneously engaging the second clutch 17. It will be noted that the pivot 34 of the reverse lever 33 is removed from the axis of the shaft 12, so that continued angular movement of the drum 11 automatically releases the plunger 35 from the head of the lever 33. The head of the lever is also convexly inclined on its rear face so that the plunger 35 may be lifted and ride freely over the lever when the direction of rotation of the drum 11 is reversed.

If it is desired to stop the operation of the machine at the end of the travel of the wire in a given direction, this may be accomplished by raising one of the studs 25 from locking position in one of the bell crank levers 20. After the pin is thus raised, movement of the cross rod 30 will disengage the driving clutch while at the same time the idle clutch remains inoperative. A hand lever 45 is provided for manually stopping or reversing the mechanism when desired. Weighted friction bands 46 are also preferably used to tension the wire and to prevent over-running of the drums upon reverse. Any suitable polishing or cleaning devices, indicated diagrammatically at C, may be provided for operating upon the wire during its passage from one drum to the other.

In Fig. 4 I have shown a slight modification in which the end 47 of a detecting lever 48 (corresponding to the lever 40 of the preferred form) is provided with a notch 49 of sufficient width to admit a single turn of wire. With this arrangement, care is taken to wind the first turn of wire in line with the notch, and reversal of the machine is indicated when something over a full turn remains on the drum. This is of advantage with fine wire which is run at relatively higher speed, as it permits an easier and slower reversal.

Machines having my improved reversing mechanism may be set in operation and may be left practically without attention for any desired length of time, as the machine will automatically reverse the travel of the wire at the end of the run in either direction and will continue to repeat the reversal for as long a period as may be desired. The cost of operation is thus materially reduced over that of the old style machines in which it was necessary for an attendant to give the machine close attention in order to prevent over-running at the end of the travel in each direction.

While my invention is shown as embodied in a wire polishing machine, it is also of value in connection with other machines in which wire is handled in a more or less similar manner.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what I claim is:—

1. A wire working machine having in combination wire cleaning and polishing devices, a pair of drums on which the wire is alternately wound, continuously actuated mechanism effective to drive said drums alternately in opposite directions, controlling devices for said drums each including a detector directly engaging the wire on a drum, and connections from said detectors to said driving mechanism, said connections including means by which the connections may be made operable to stop or reverse the drum movement as desired.

2. A wire working machine having in combination wire cleaning and polishing devices, a pair of drums on which the wire is alternately wound, continuously actuated mechanism effective to drive said drums alternately in opposite directions, and controlling devices for said drums each including a detector directly engaging the wire on a drum, a lever mounted on a fixed pivot spaced from the axis of the drum, and an engaging member rotatable with said drum and yieldingly movable into position to engage said lever, said member being held out of operative position by said detector when the latter is engaged by the wire on said drum.

3. A wire working machine having in combination wire cleaning and polishing devices, a pair of drums on which the wire is alternately wound, continuously actuated mechanism effective to drive said drums alternately in opposite directions, and controlling devices for said drums including detectors directly engaging the wire on said drums, a shipper rod controlled by said detectors, clutches for said drums, and separate connections from said rod to said clutches.

4. A wire working machine having in combination wire cleaning and polishing devices, a pair of drums on which the wire is alternately wound, continuously actuated mechanism effective to drive said drums alternately in opposite directions, and controlling devices for said drums including detectors directly engaging the wire on said drums, a shipper rod controlled by said detectors, clutches for said drums, and separate connections from said rod to said clutches, including means by which either

clutch may be disconnected from said rod while the other clutch remains operative to stop the machine.

5. A wire working machine having in combination wire cleaning and polishing devices, a pair of drums on which the wire is alternately wound, continuously actuated mechanism effective to drive said drums alternately in opposite directions, and means to automatically reverse the direction of movement of the drums as the wire approaches its limit of travel in either direction, said means being also adjustable to stop the machine.

In testimony whereof I have hereunto affixed my signature.

RICHARD K. HUTCHINS.