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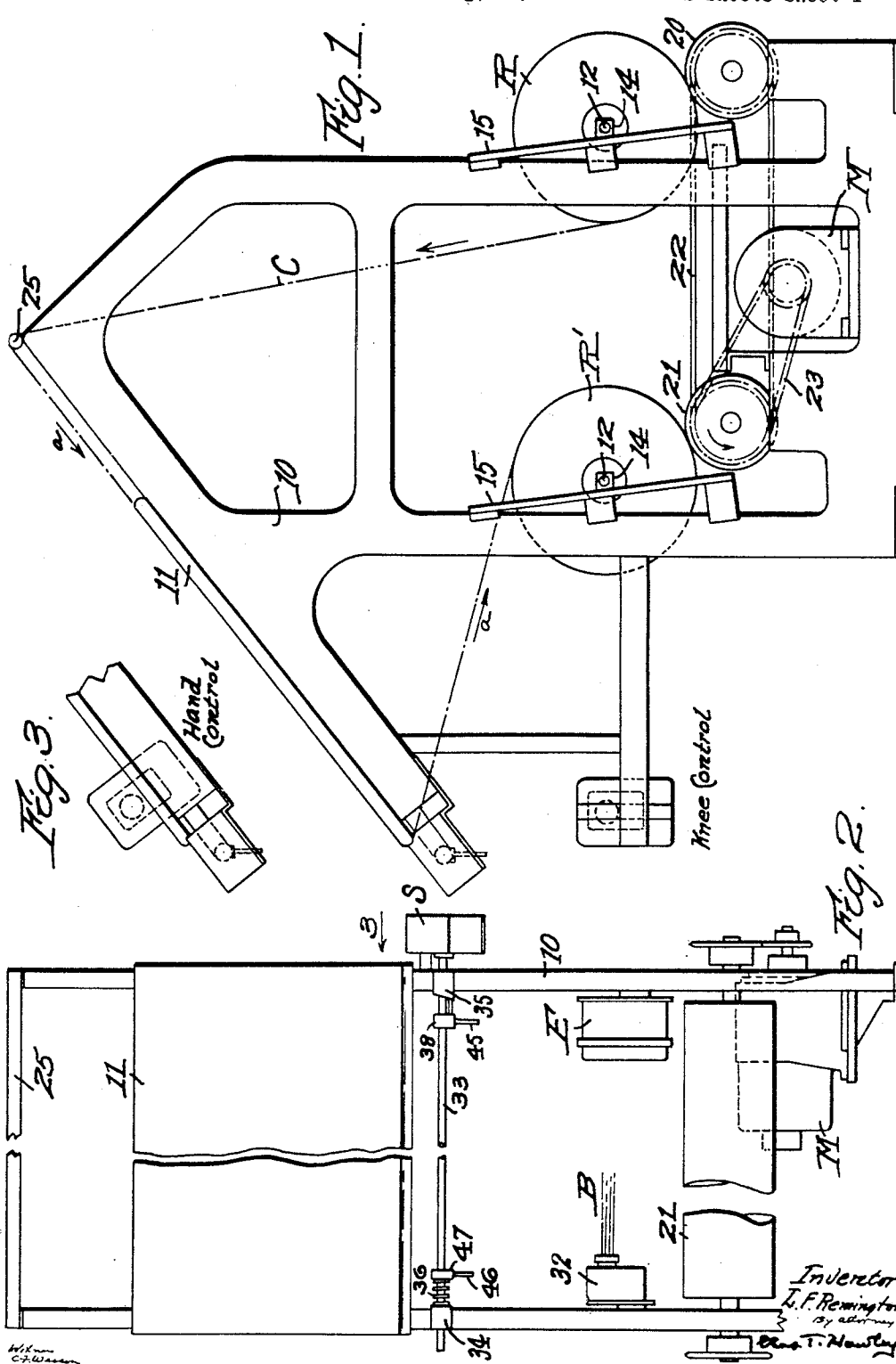
L. F. REMINGTON

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CLOTH INSPECTING MACHINE

Filed Aug. 16, 1939

2 Sheets-Sheet 1



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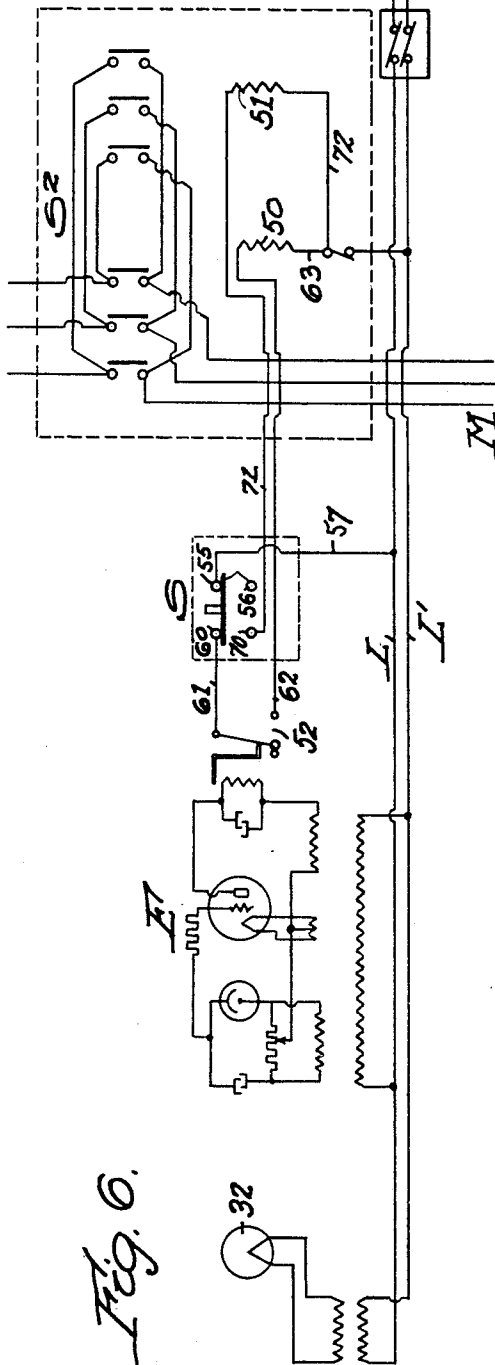
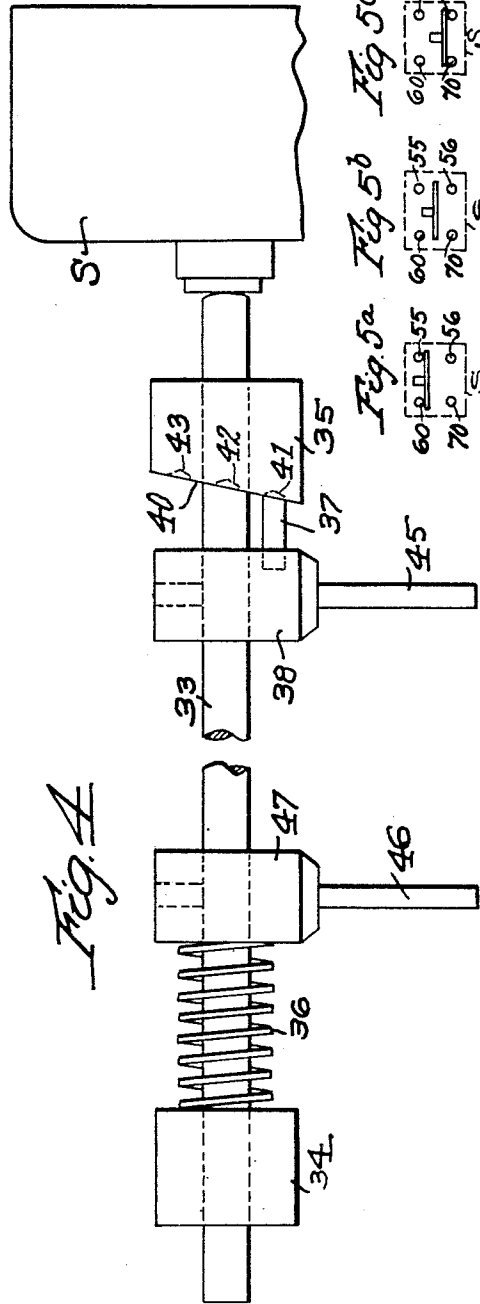
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CLOTH INSPECTING MACHINE

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7 Claims. (Cl. 26—70)

This invention relates to machines for handling cloth during inspection for weaving defects. In such machines, it is customary to pass the cloth over an inclined table for convenient inspection, with provision for moving the cloth by power in either a forward or a rearward direction and for stopping the cloth whenever defects are found. Such machines are commonly controlled by pedals or by other mechanical devices actuated by the operator.

It is the general object of my invention to provide improved electrical control means for this type of inspecting machine, which will require no perceptible effort on the part of the operator and which will leave the operator's hands free for other necessary duties.

In the preferred form, my improved control means includes a photo-electric device which controls forward cloth feed only and which causes the cloth to be fed forward only when a light beam is interrupted.

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 my invention is shown in the drawings, in which

Fig. 1 is a side elevation of a cloth inspecting machine embodying my improvements;

Fig. 2 is a front elevation thereof, broken away to reduce the width;

Fig. 3 is a partial side elevation of certain parts, looking in the direction of the arrow 3 in Fig. 2;

Fig. 4 is an enlarged front view of a manual control device;

Figs. 5^a, 5^b and 5^c are diagrammatic views showing different positions of a manually controlled switch; and

Fig. 6 is a diagrammatic view of the photo-electric control apparatus and mechanism controlled thereby.

Referring to Figs. 1 and 2, my improved inspecting machine comprises a frame 10 supporting an inclined inspecting table 11 over which the cloth C is drawn forward and downward for inspection purposes, being unwound from a supply roll R and being rewound on a second roll R'.

The rolls R and R' are provided with journals 12 rotatable in boxes 14 which are freely slidable vertically along inclined guide-bars 15. The roll R rests on a drum 20 and the roll R' rests on a drum 21. The drums 20 and 21 are provided with pulleys or sprockets connected by a belt or chain 22, and the roll 21 is connected by a belt or chain 23 to a reversible driving motor M. Pref-

erably, the peripheral speed of the drum 21 is slightly greater than the peripheral speed of the drum 20, so that the cloth when running in the forward direction as indicated by the arrows a will be under slight tension.

The cloth passes upward from the roll R to a guide-roll 25, thence downward over the table 11 to the roll R'. When the motor M is reversed, the path of travel of the cloth is the same but in the opposite direction.

An electric light 32 (Fig. 2) provides a light beam B directed toward a photo-electric relay E by which the operation of the motor M is in part controlled. Said motor M is also in part under the direct control of a reversing switch S, 15 mounted for selective manual operation by a control rod 33.

The rod 33 is slidable in fixed bearings 34 and 35 on the front of the machine and is yieldingly pushed to the right in Fig. 4 by a spring 36. Such movement to the right is limited by a stud 37 mounted in a collar 38 adjustably secured to the rod 33 and engaging an inclined surface 40 at the left end of the hub 35.

The surface 40 is preferably provided with shallow recesses 41, 42 and 43, concentrically disposed with respect to the rod 33 and each adapted to receive the beveled or rounded end of the stud 37. A handle 45 is secured in the collar 38, and a second handle 46 is secured in a collar 47 which receives the thrust of the spring 36.

If one of the handles 45 or 46 is swung forward and upward, as viewed in Fig. 4, the stud 37 will be moved successively from the recess 41 to the recess 42 and thereafter to the recess 43, thus permitting the right-hand end of the rod 33 to move progressively to the right in Fig. 4 to shift the switch S from forward to neutral or reverse position, indicated in Figs. 5^b and 5^c respectively.

The rod 33 and associated parts thus constitute means for manually and selectively operating the machine in forward or reverse direction and for interrupting the operation of the machine by placing the switch S in neutral.

The coaction of the photo-electric relay with the switch S and with the manual control devices shown in Fig. 4 is best understood by reference to the diagram in Fig. 6.

In said diagram, I have shown the light source 32, the photo-electric relay E, the manually controlled switch S, the motor M, line wires L and L', and a main reversing switch S² for said motor M, controlled by electro-magnets or solenoids 50 and 51.

The photo-electric relay E is of a usual com-

merical type and need not be described in detail except to state that the relay controls a switch 52 in such manner that the switch is open when the beam B energizes the relay, and is closed when the beam B is interrupted, as when some element, such as the operator's knee, is interposed in the path of the light beam.

The switch S has upper and lower contacts 55 and 56, both connected by a wire 57 to the line L, and the switch S also has an upper contact 60 connected by a wire 61 to one pole of the switch 52. The other pole of the switch 52 is connected by a wire 62 to the solenoid 50 and thence through a wire 63 to a line wire L'.

Consequently, if the switch S is in the position shown in Fig. 5^a or Fig. 6, and the light beam B is interrupted, a circuit will be closed from the line L through the switches S and 52 and the solenoid 50 to the line wire L', thus energizing the device 50 and throwing the reversing switch S² to forward position. If the interposed element is removed and the light beam B strikes the relay E, the relay opens the switch 52, breaking the motor control circuit and allowing the reversing switch S² to return to neutral, thus stopping the motor M and the forward and downward travel of the cloth C.

A fourth contact 70 in the switch S is connected by a wire 71 to the reverse solenoid 51 and thence through a wire 72 to the return wire 63 and line wire L' as previously described.

If the manual control rod 33 is turned so that the stud 37 enters the recess 42, the switch S will assume the position shown in Fig. 5^b, with the circuits through both solenoids 50 and 51 broken and the entire machine at rest. If the rod 33 is given a further movement to position the stud 37 in the recess 43, the switch S will assume the position indicated in Fig. 5^c, closing the circuit between the contacts 56 and 70 and causing the motor M to operate in reverse direction, thus rewinding the cloth on the supply roll R.

I have thus provided very convenient and effective means for controlling the operation of my improved machine, both manually and photo-electrically. It should be particularly noted that the switch 52 is in series with the switch S only when said switch is in the forward position indicated in Fig. 5^a, so that the light beam and photo-electric relay E controls the starting and stopping of the machine only when the machine is set to operate in a forward direction.

When the machine is in neutral or is set for reverse operation, the circuit between the contacts 55 and 60 is broken in the switch S, so that opening or closing of the switch 52 has no effect whatever on the operation of the machine.

Consequently, the operator can stop the machine manually or operate the machine in reverse at any time by merely turning the rod 33, but for forward movement, he must not only turn the rod 33 to place the switch S in the position shown in Fig. 5^a, but he must also interrupt the light beam B. During normal operation of the machine, the cloth will therefore remain at rest except when the operator interrupts the light beam B by inserting his knee or some other part of his anatomy or clothing in the path of the beam.

While I have shown the beam conveniently located for interruption by the knee, this location is not critical and the light beam may be otherwise positioned. No movable part is engaged by the operator, so that fatigue is reduced to a minimum.

Although I have described my invention as applied to a cloth inspecting machine, it may also be used to advantage in any machine in which cloth or any similar material is drawn forward and rearward through the machine under the control of the operator and the machine is frequently started, stopped, or reversed.

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 cloth inspecting machine comprising an inspection table, feeding means to draw a piece of cloth over said table in selected forward and rearward directions, manual means to selectively control said forward and rearward movement of said cloth, and photo-electric means operable in series with said manual means during forward cloth movement only.

2. A cloth inspecting machine comprising an inspection table, feeding means to draw a piece of cloth over said table in selected forward and rearward directions, manual means to change the direction of cloth movement and to disable the feeding mechanism, and photo-electric means including a light beam which is effective to control the forward movement only of said feeding mechanism and cloth.

3. A cloth inspecting machine comprising an inspection table, feeding means to draw a piece of cloth over said table in selected forward and rearward directions, a manually operated control device for said feeding means having forward, rearward and neutral positions, and a photo-electric control device for said feeding means including a light beam and operative only when said feeding means is connected for forward operation of said machine.

4. A cloth inspecting machine comprising an inspection table, feeding means to draw a piece of cloth over said table in selected forward and rearward directions, a manually operated control device for said feeding means having forward, rearward and neutral positions, and a photo-electric control device for said feeding means including a light beam and operative only when said feeding means is connected for forward operation of said machine, said device rendering said feeding means operative when the light beam is interrupted, and said light beam being effective to break the operative feeding circuit when said light beam is not interrupted.

5. Cloth feeding and control apparatus comprising feeding means to draw a piece of cloth through said apparatus in selected forward and rearward directions, a manually operated control device for said feeding means having forward, rearward and neutral positions, and a photo-electric control device for said feeding means including a light beam and operative only when said feeding means is connected for forward operation of said apparatus, said device rendering said feeding means operative when the light beam is interrupted, and said light beam being effective to break the operative feeding circuit when said light beam is not interrupted.

6. A cloth inspecting machine comprising an inspection table, feeding means effective to draw a piece of cloth over said table in selected forward and rearward directions, manual means to selectively determine the direction of movement and to exclusively control said feeding means during rearward movement of said cloth, and means to stop and start the cloth under photo-electric control when said machine is set for forward movement.

ward cloth movement only, said photo-electric control being simultaneously rendered inoperative when the feeding means is rendered operative to move the cloth in a rearward direction.

5 7. A cloth inspecting machine comprising an inspection table, feeding means to draw a piece of cloth over said table in selected forward and rearward directions, photo-electric means which

in part controls said forward movement of the cloth, and manual means effective to selectively determine the direction of movement of the cloth and coacting with said photo-electric means in causing the cloth to be moved forward, said 5 manual means being also operable to prevent cloth movement in either direction.

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