

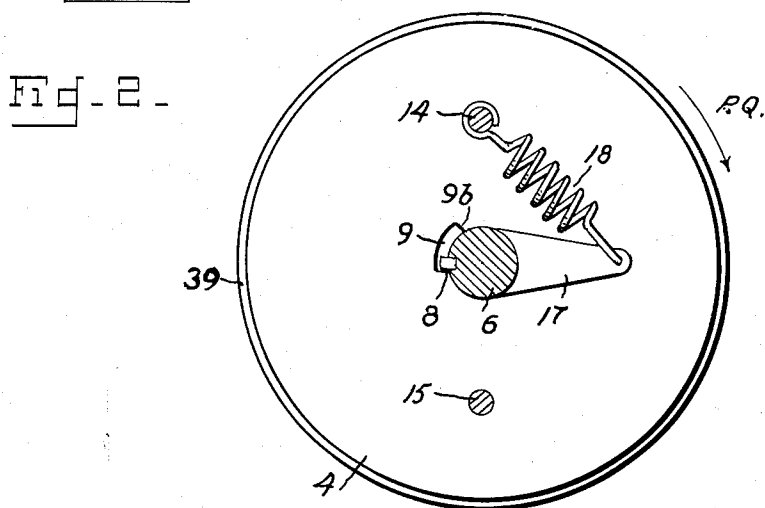
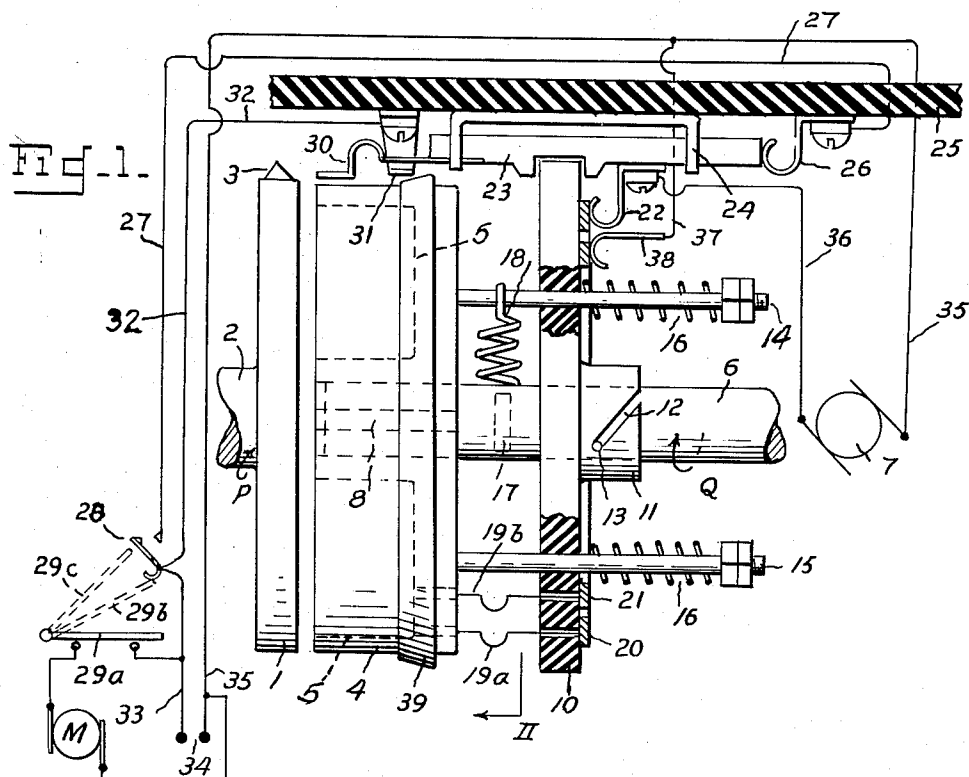
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H. W. BRINKMAN ET AL.

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STOPPING MECHANISM FOR SEWING AND OTHER MACHINES

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INVENTOR S

Hendrik W. Brinkman
Bernardus J. Brinkman,

BY

Per Mince

ATTORNEY

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STOPPING MECHANISM FOR SEWING AND OTHER MACHINES

Hendrik W. Brinkman, Leiden, and Bernardus J. Brinkman, Utrecht, Netherlands, assignors to Louis Johannes Mario Reher, called Wiggermann, Amsterdam, Netherlands

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4 Claims. (Cl. 192—146)

This application is a continuation of application, Serial No. 210,782, now forfeited, filed February 13, 1951.

This invention relates to a mechanism adapted to stop a sewing or other machine in a predetermined position, for instance, in the case of sewing machines, in the upper position of the needle. One object of the invention is to provide a simple and reliable electrically operated mechanism for carrying out said operation.

In the drawing:

Fig. 1 is a side view, partly in section, of one construction according to this invention.

Fig. 2 is a part-sectional elevation as viewed in the direction of the arrow II in Fig. 1.

1 designates a disc secured to and rotating with the fly-wheel shaft 2 of a sewing machine for industrial purposes. The disc rotates in the direction of the arrow P and carries a stud 3. When this stud is in its upper position as shown, the needle of the sewing machine will also assume its upper position.

Disc 1 cooperates with an electrically operated friction brake 4. When the electric circuit of the electromagnet 5 mounted therein is closed, brake 4 will move to the left and brake the rotational movement of disc 1. Brake 4 is mounted on a shaft 6 which can be slowly rotated by a slow speed driving means such as an electromotor 7, in the direction of arrow Q, that is in the direction of rotation of disc 1. Disc 4 is mounted on the shaft 6 by means of a key 8 cooperating with a key-hole 9 (Fig. 2) which is wider than the key, so that brake 4 can execute a limited angular movement of about 45° with respect to the shaft 6.

On the latter is mounted also a commander disc 10 of insulating material. In the hub 11 of this disc there is provided an oblique slot 12 in which a pin 13 moves which is fixed to the shaft 6.

The commander disc 10 is axially movably connected to brake 4 by means of guide pins 14, 15, which are secured to the brake 4. Adjustable springs 16 tend to move the commander disc to the left.

Between guide pin 14 (see also Fig. 2) and a lever 17 fixed to shaft 6, there is mounted a spring 18 which tends to rotate brake 4 in the direction of arrow P with respect to shaft 6.

The brake electromagnet 5 may receive current, through wires 19a, b, from two rings 20, 21 mounted on the commander disc 10. Ring 20 cooperates with a sliding contact 22 connected with a metal bridge 23. This bridge is, as appears from the drawing, axially movable with the commander disc and is guided by a bracket 24 secured to a plate 25 of insulating material. In the right hand position shown in the drawing the contact bridge can receive current from a contact spring 26, which is connected through a wire 27 with one pole of a switch 28. The switch is closed, when the starting treadle 29 of the machine reaches, from the depressed position 29a (in which the machine operates by means of motor M and current supply 34), the position 29b in which the

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machine is stopped. The switch is opened again when the treadle reaches the released position 29c.

The contact bridge carries at its left side a contact spring 30 which can receive current from a contact spring 31 secured to plate 25. Contact spring 31 is connected by a wire 32 with the pivot of switch 28, and further, through a wire 33, with one pole of an electric current source 34. The other pole of the latter is connected by a wire 35 with the electromotor 7 and further, by a wire 36, with contact bridge 23. Branched from wire 35 is a wire 37 secured to a sliding contact 38 cooperating with the other ring 21.

The operation is as follows:

In the illustrated position, with the treadle 29 fully depressed, the sewing machine operates and disc 1 rotates. The brake and the electromotor 7 are dead.

Now the treadle is allowed to rise. This causes in the first place the driving motor of the sewing machine to become dead. Further, switch 28 is operated, so that the following electric circuit is closed: current supply 34, wire 33, switch 28, wire 27, contact spring 26, contact bridge 23, sliding contact 22, ring 20, wire 19a, electromagnet 5, wire 19b, ring 21, sliding contact 38, wire 37, wire 35, current supply 34. Also the electromotor 7 is energized through wire 36.

The energization of the magnet 5 causes the brake 4 to move to the left against disc 1 and retards its movement. Also the commander disc 10 and the contact bridge 23 move to the left. This causes the interruption of the electric connection of the latter with contact spring 26. However, the conical ring 39 mounted on brake 4 presses, consequent on the movement of the latter to the left, contact spring 31 upwards and against contact spring 30. Contact bridge 23 will now receive current, instead of from the right through wire 27, from the left through wire 32. Hence, the electromagnet and the electromotor 7 remain energized, also when by complete release of the treadle, switch 28 is reopened, and the brake will maintain its braking action upon disc 1.

On the other hand, disc 1 will, as long as it rotates faster than the electromotor 7, drag along the brake 4 in the direction of arrow Q, so that key 8 will lag behind in its key-hole and will assume the position shown in Fig. 2.

The moment will arrive, however, that disc 1 will have been retarded to such an extent so as to rotate synchronous with brake 4, and will no more exert a propelling action upon the latter. On this moment the electromotor will make up its arrears and rotate shaft 6 in the direction of arrow Q with respect to brake 4, until key 8 abuts against the other face 9b of the key-hole 9. In this position shaft 6 will have been rotated ahead through an angle of about 45° with respect to brake 4 and to commander disc 10.

This angular movement will have caused pin 13 (which is integral with shaft 6) to move, through its cooperation with the oblique slot 12, the commander disc 10 still further to the left. This disc moves in turn the contact bridge 23 to the left which causes contact spring 30 to come into the path of the rotating stud 3. As soon as this stud (and in consequence the needle of the sewing machine) arrives in the upper position as shown, it lifts contact spring 30 and thus cuts the electric contact 30—31, so that the electric circuits of both the brake electromagnet and the electromotor 7 are interrupted.

The sewing machine stops in this desired position, and brake 4 releases disc 1. Spring 18 pulls brake 4 again into the position of Fig. 2 with respect to shaft 6, which causes also a movement to the left of pin 13 with respect to its slot 12, so that the parts 10 and 23 will return to their positions of Fig. 1.

The machine can be operated again by depression of

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the treadle 29 and with this the position with which this description started has been restored.

What we claim is:

1. In control mechanism for a sewing machine, in combination: a brake element for retarding the movement of the machine, a rotary part rotatable with the machine and adapted to be engaged by said brake element, means supporting the brake element for rotational movement together with said rotating part of the machine, a slow speed driving means, means connecting said driving means with said brake element and permitting a limited angular movement of the brake element with respect to the driving means, an interruptor member movable with the machine, electrical means for operating the slow speed driving means and the brake element, and a control member for said electrical means adapted to be moved, upon the relative limited angular movement of the brake element into the path of the said interruptor member for actuation thereby to disconnect said electrical means.

2. In control mechanism for a sewing machine as claimed in claim 1, the rotary brake element being adapted to move axially when actuated, the control member being connected with the brake element so as to be moved by axial movement of the rotary brake element, said electrical means including two separate circuits each for energizing the slow speed driving means and the brake element, and means operated by axial movement of said brake element for switching from one circuit to the other and for connecting said control member in one of said circuits.

3. In control mechanism for a sewing machine, in com-

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bination, a main driving means with energizing means therefor, a rotary part rotatable with and driven by said main driving means, a brake element journaled for rotational movement with said rotary part and adapted to cooperate with said part to retard the machine, a slow speed driving means operatively connected with said brake element to drive said brake element at a speed slower than the speed of said part, an electrical circuit for operating the slow speed driving means, means to simultaneously energize said electrical circuit to operate said slow speed driving means and render the main driving means ineffective to operate the sewing machine, means movable synchronously with the machine, said electrical circuit including means cooperative with said synchronously movable means and effective only when said part is retarded by said brake element to a predetermined rotational speed to permanently open said electrical circuit and stop the machine with the rotary part in a substantially predetermined angular position.

4. In control mechanism for a sewing machine as defined in claim 3, and means preventing the operation of said circuit opening means prior to the synchronization of the brake element and the rotary part of the machine.

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