March 6, 1934. D. H. CHASON 1,949,826

SEWING MACHINE MOTOR CONTROLLER

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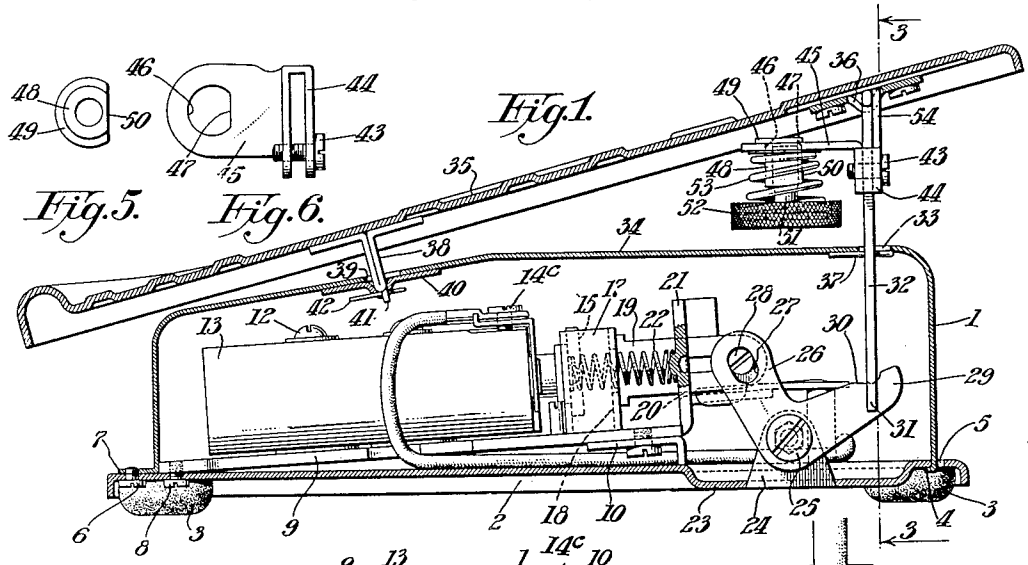


Fig. 1.

Fig. 5.

Fig. 6.

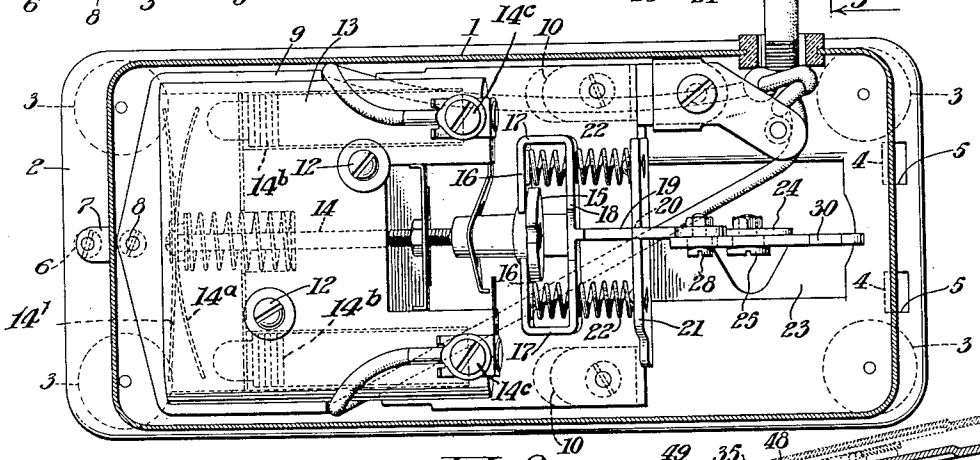


Fig. 2.

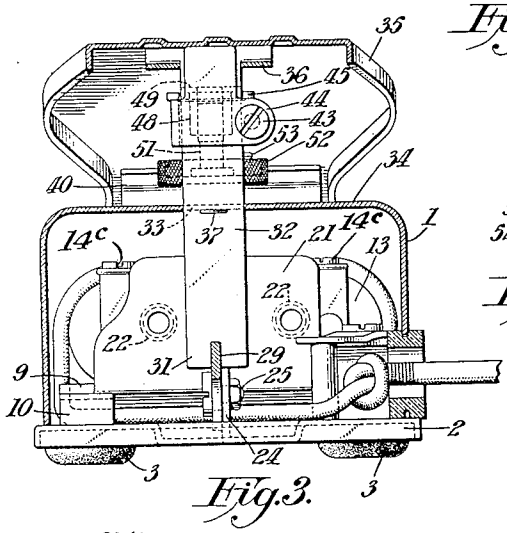


Fig. 3.

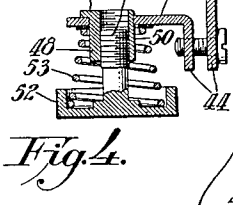


Fig. 4.

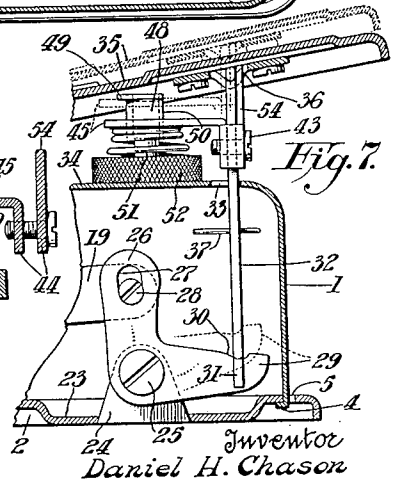


Fig. 7.

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SEWING MACHINE MOTOR-CONTROLLER

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Application February 21, 1931, Serial No. 517,625

5 Claims. (Cl. 201—51)

This invention relates to motor-driven sewing machines equipped with a controller and means influenced by the operator for shifting the movable element of the controller to regulate the speed of the motor and of the sewing machine driven thereby.

For certain classes of sewing machine work, such as embroidering and darning, it is desirable to maintain a predetermined slow working speed and this has heretofore imposed a physical strain upon the operator as it necessitated the holding of the movable controller element in a closely controlled floating position intermediate its extreme or "off" and "full on" positions.

It has been proposed to provide the controller of an outfit of this nature with a stop against which the operator may maintain an element of the movable train of mechanism of the controller, to limit the machine-speed to that desired for the work in hand, but it is found that a mere stop interferes with the proper operation of the machine for the reason that when it is set to secure the desired slow running machine-speed, the machine will not start when the controller is shifted from "off" position to the limiting position determined by the stop. This is because the controller, in its slow-speed running position, will not pass enough current to start the motor under the static friction of the motor and machine bearings. Hence it is necessary, with a device of the nature heretofore proposed, for the operator to give the machine a boost by handling the balance wheel every time the machine is started.

Another objection to a controller, such as heretofore fitted with a stop, is that the variable resistance element comprises a series of contact buttons over which plays a movable contact arm. These buttons cannot conveniently be made sufficiently numerous to secure the finely graduated machine speeds required.

The present invention has for an object to provide a sewing machine motor-controller which may be readily manipulated by the operator, without objectionable physical strain, to start the machine and hold any desired predetermined speed, or to exceed such speed if desired.

The invention comprises the devices, combinations and arrangements of parts hereinafter referred to and particularly pointed out in the claims.

The features of the invention and the advantages attained thereby will be readily understood from the following detailed description of a preferred embodiment of the invention illustrated in the accompanying drawing in which Fig. 1 is a longitudinal vertical section through the controller. Fig. 2 is a horizontal section through the controller casing showing the variable resistance element in plan. Fig. 3 is a transverse vertical section on the line 3—3, Fig. 1. Fig. 4 is a sectional view of the adjustable stop-device of the controller. Figs. 5 and 6 are detail views of elements of the stop-device, and Fig. 7 is a fragmentary view similar to Fig. 1 of the stop-device in starting position.

The invention is shown as embodied in a known type of foot-operated carbon pile rheostat. Such a controller comprises a casing 1 including a base 2 having rubber feet 3 adapted to rest upon the floor. The casing is provided at its toe-end with hook-tongues 4 which pass through apertures 5 in the base 2 and engage the under face of the latter. A single fastening screw 6 passes through the base 2 at the heel-end of the latter and is threaded into the tongue 7 projecting rearwardly from the casing 1.

Secured at one end by the screw 8 to the base 2 is the base-plate 9 of a standard straight-pull or draw-bar operated controller-unit, such as disclosed in the U. S. patents to D. H. Chason, Nos. 1,721,069, and 1,721,070, of July 16, 1929, and No. 1,792,818, of Feb. 17, 1931. The controller-unit is screwed at its other end to the tongues 10 struck up from the base 2 to support the unit at a slight inclination to such base.

In such a controller-unit there is secured to the base-plate 9, by screws 12, a carbon compression type rheostat 13 including a pull-rod 14 on which is screwed a head 15 embraced by the ends of the arms 16 which extend inwardly from the side-members 17 at the ends of the cross-head 18 connected to the draw-bar or straight-pull operating member 19 which passes through an aperture 20 in the wall 21 bent upwardly from the base-plate 9. The pull-rod 14 carries the usual bow-spring bridging contact member 14^a which is adapted, when the pull-rod 14 is actuated, to first close the electric circuit through the spaced stacks 14^b of carbon disks connected to the controller terminal screws 14^c and subsequently progressively decrease the electrical resistance of said stacks of carbon disks by increase of pressure exerted thereon by the bow-spring 14^a and its stiffer backing spring 14^d. Recovery springs 22 serve to restore the draw-bar to initial or "off" position when the pull thereon is relieved.

Struck up from the bottom wall 23 of a depression in the base 2 is an ear 24 on which is fulcrumed at 25 a bellcrank-lever one arm 26 of which is slotted at 27 to receive the stud-screw

28 fixed to the controller draw-bar 19. The other arm 29 of the bellcrank-lever is formed in its upper edge with a curved recess 30 and is straddled at said recess by the forked lower end 31 of the push-rod 32 which extends downwardly through the clearance aperture 33 in the top-wall 34 of the casing from the toe-end of the pedal 35. The push-rod 32 is formed at its upper end with a T-head which is connected to the pedal 35 by the slotted-strap 36. A cotter-pin 37 passing through the push-rod 32 within the casing 1 prevents withdrawal of the push-rod from the bellcrank-lever-arm 29.

Spot-welded to the pedal 35 near the heel-end of the latter is the fulcrum-piece 38 which passes through the aperture 39 in the top-wall 34 of the casing and rests in a groove in the supporting plate 40 spot-welded to the underside of the top-wall 34. The fulcrum-piece 38 has a central tongue 41 which projects through an aperture in the bottom of the groove in the plate 40 and receives a cotter-pin 42 to retain the fulcrum-piece 38 in its working position on the cover 34. The construction is such that the associated cover 34, pedal 35 and push-rod 32 elements may be readily detached from the base 2, rheostat 13 and bellcrank 26 elements; it being merely necessary to remove the screw 6 holding the cover- and base-members together.

Clamped to the push-rod 32 by means of the screw 43 is the U-shaped strapped shank 44 of the sheet-metal bracket 45 which is formed with a circular aperture 46 having a straight side-portion 47. This aperture is entered by the internally screw-threaded nut 48 having a flanged end 49 and a slabbed side-wall 50. The nut 48 is thus confined to slide relative to the aperture 46 but is held against rotation in said aperture.

Threaded into the nut 48 is the stem 51 of the stop-screw 52. A spring 53 is interposed between the bracket 45 and the head of the stop-screw 52. The strap 44 of the bracket 45 has an extension 54 which bears against the under face of the pedal 35 and prevents upward slippage of the bracket 45 upon the rod 32

In the operation of the device, the operator depresses the pedal until the stop-screw 52 engages the stationary element or top-wall 34 of the controller. If, as is likely, the machine does not start, the operator further depresses the pedal 35 to start the machine; the spring 53 yielding as the bracket 45 slides downwardly along the nut 48, as shown in Fig. 7. After the static friction of the machine has been overcome by depression of the pedal 35 beyond the point where the operator is sensible of the action of the stop, the operator relieves the pressure upon the pedal until it is perceived by the sense of feeling that the stop is resting upon the top of the casing. It will be observed that the spring 53, which bears in opposite directions upon the bracket 45 and adjusting screw 52, is held by the bracket 45 and adjusting screw 52 under initial compression or strain, the degree of which varies with the adjustment of the screw 52. The spring 53 is made stiff enough to enable the operator to readily feel and hold the position of engagement of the stop with the controller casing without compressing such spring beyond its initial degree of compression. It is not made so stiff, however, that it is burdensome to the operator to further compress it for starting purposes.

The stepless range of speeds made possible by the use of a carbon controller is particularly advantageous in this connection, in combination with a finely adjustable or screw-threaded yielding stop, as such combination enables any selected operating speed to be closely predetermined and closely held. The construction and location of the stop, relative to the elements of the controller are of advantage in that the stop-screw is readily accessible for adjustment, yet is disposed in a protected position. It is of simple construction and is easily applied to and removed from the controller as a self-contained unitary assembly without disassembly of any of the controller parts.

The stop-screw 52, when screwed into the nut 48 as far as it will go, is clear of the top-wall 34 of the controller casing in the "full on" or fully depressed position of the pedal 35. Hence the stop-device may be easily shifted into and out of operative position.

While the invention is disclosed in one specific embodiment, as applied to a foot-operated sewing machine motor-controller of the carbon-compression type, it is not to be understood as limited in its broader aspects to any particular type of sewing machine motor-controller, nor it it to be understood as limited in its broader aspects to a foot-operated controller.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A sewing machine motor-controller comprising a casing adapted when in use to rest upon the floor and having a top-wall, a pedal fulcrumed on the top-wall of said casing, an electrical motor-control unit within said casing and including a movable element, an endwise movable vertically disposed rod passing through the top-wall of said casing for transmitting motion from said pedal to said movable controller element, and a yielding stop mounted on said rod for cooperation with the top-wall of said casing.

2. A sewing machine motor-controller comprising a casing adapted when in use to rest upon the floor and having a top-wall, a pedal fulcrumed on the top-wall of said casing and including a movable element, and endwise movable vertically disposed rod passing through the top-wall of said casing for transmitting motion from said pedal to said movable controller element, a yielding stop mounted on said rod for cooperation with the top-wall of said casing, said stop comprising a bracket secured to said vertically disposed rod, a screw-threaded part carried by and slidable relative to said bracket, a stop threaded to mate with said screw-threaded part, and a spring between said bracket and stop.

3. The combination with a variable resistance unit and a stationary element, of operator-influenced means movable over a given range progressively decreasing the resistance of said unit, a recovery spring opposed to the effort of the operator for restoring the operator-influenced means to "off" position, and an initially strained spring interposed between said stationary element and said operator-influenced means in a position to suddenly add at a predetermined point within said range in the movement of the operator-influenced means its resistance to further strain to the gradually increasing resistance offered by the recovery spring.

4. The combination with a variable resistance unit and a stationary element, of operator-influenced means movable over a given range progressively decreasing the resistance of said unit, a recovery spring opposed to the effort of the operator, a spring-stop interposed between said stationary element and said operator-influenced

means within said range, and adjustable means for maintaining said spring-stop in a state of initial strain before it is operatively engaged by the relative movement of said stationary element and operator-influenced means.

5. The combination with an electric circuit controller including manually operated means movable over a given range to first close the electric circuit through said controller and subsequently progressively vary the electrical resistance thereof, of a stop-spring, and means for holding said stop-spring under an initial strain, said stop-spring being so related to said manually operated means as to be further strained thereby over the latter portion only of the range of movement of said manually operated means after the electric circuit has been closed.

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