Nov. 21, 1967 W. R. PETERSON ET AL 3,353,424

MOTOR SPEED CONTROLLERS

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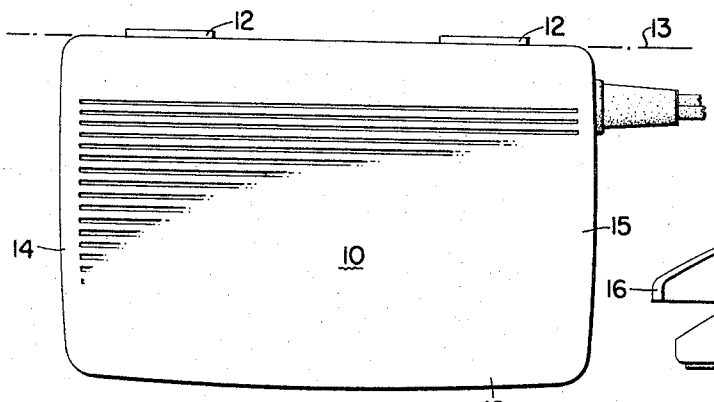

Fig.1

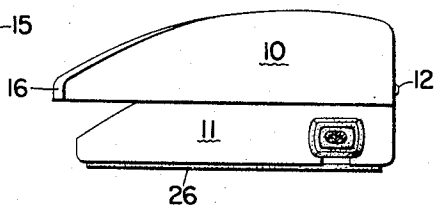

Fig.2

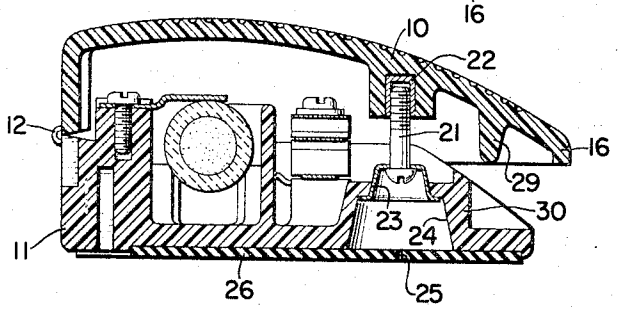

Fig.5

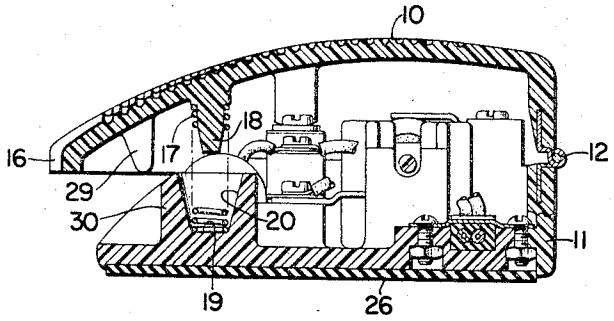

Fig.6

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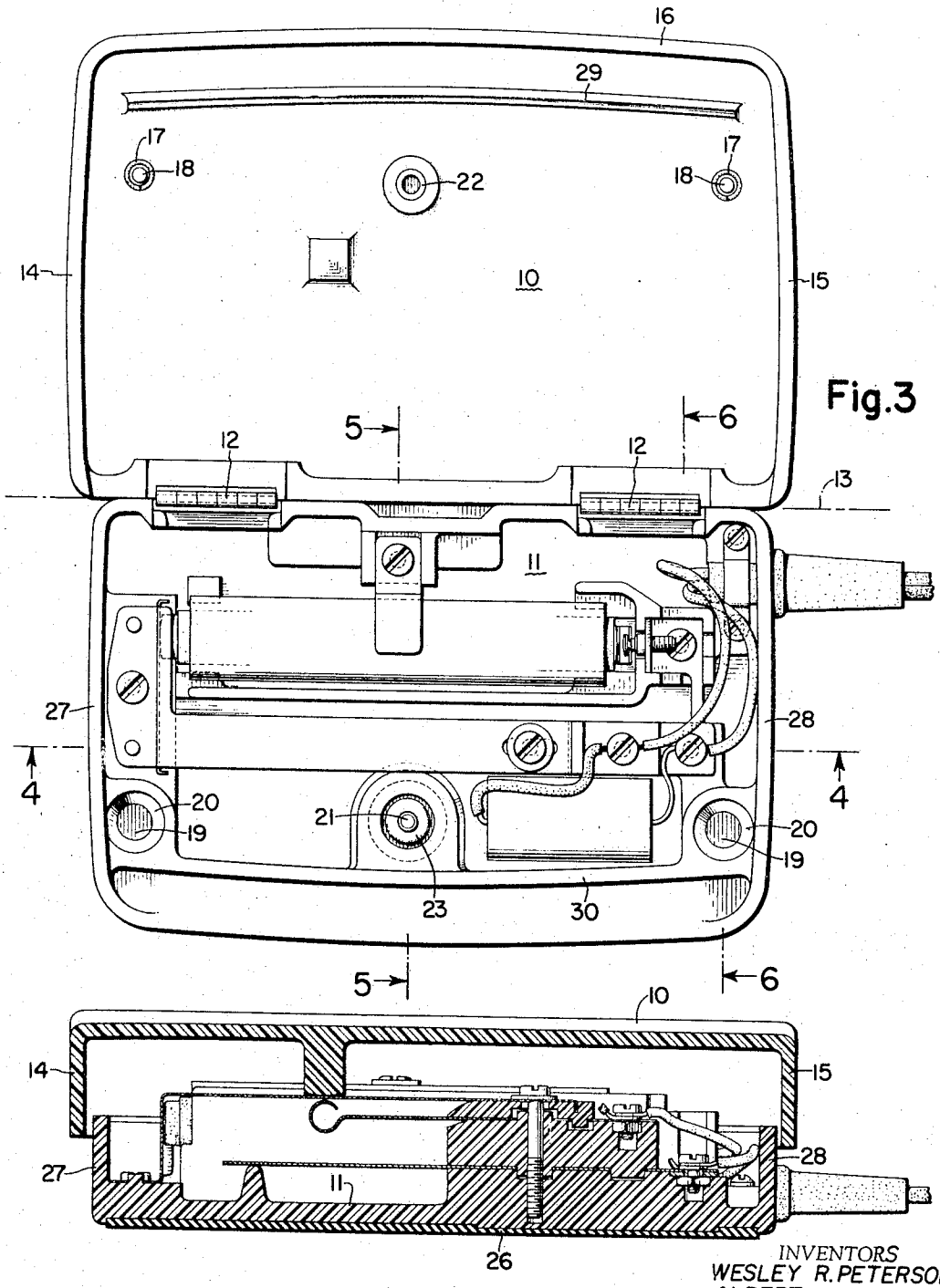

Fig.3

Fig.4

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MOTOR SPEED CONTROLLERS

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1 Claim. (Cl. 74—560)

ABSTRACT OF THE DISCLOSURE

A foot-operated motor speed controller has a generally rectangular box base and a cover which fits said base along one of the longer edges in abutting relation therewith but overhangs the base on all the other edges. Hinge means positioned along said abutting edges provide a hinge axis coincident therewith which permits the cover to be rotated about its long dimension through 180 degrees to fully expose the base. The cover is formed with an external top surface which is convexly curved downwardly away from the top of the hinged edge toward the front edge to provide the minimum vertical dimension along said front edge which also extends in the direction of the longer dimension. The cover forms the actuator for control components located in the base.

This invention relates to controllers for controlling the speed of small electric motors such as electric sewing machine motors.

These controllers are usually foot-operated devices actuated either by a small button or by a pivoted plate element approximating the width of the foot. In this prior art form due to the lack of a prominent actuator, they require the accurate placement of the foot which is somewhat distracting to the operator whose attention is more importantly demanded by the work at the needle.

It is an object of this invention, therefore, to provide a foot controller having a foot-operated actuator of a shape and size to be prominently available for foot contact over a maximum of the exposed area of the device.

Another object of this invention, is to provide a foot controller having a mimum vertical height along the front edge facing the operator to effect easy engagement of the actuator with the foot in the natural raised toe and pivoted heel position.

A further object of this invention, is to provide a foot controller in the form of a generally rectangular box base with a hinged actuating cover which overhangs and telescopes with the box and has its long dimension parallel to the hinge axis.

A still further object of this invention is to provide a foot controller with a prominently exposed actuator and having simple means and easy assembly for biasing and setting the actuator to an initially adjusted position.

The foregoing and other advantages will appear more fully hereinafter from a consideration of the detailed description which follows, taken with the accompanying drawings wherein one embodiment is illustrated by way of example. It is to be expressly understood, however, that the drawings are for illustration purposes only and are not to be construed as defining the limits of the present invention:

FIGS. 1 and 2 are top plan and side elevation views, respectively, of a controller made in accordance with the present invention.

FIG. 3 is an enlarged plan view of the controller of FIGS. 1 and 2 with the cover swung away to expose the component parts enclosed therein.

FIG. 4 is a longitudinal sectional view taken substantially on line 4—4 of FIG. 3 with the cover disposed in its normal operating position.

FIGS. 5 and 6 are transverse sectional views taken substantially on lines 5—5 and 6—6, respectively, of FIG. 3 with the cover disposed in its normal operating position.

Referring now to FIGS. 1 and 2, a controller made in accordance with the present invention has a casing comprising a hollow cover or foot pedal **10** pivotally connected along its rear edge to the rear edge of a hollow base **11** by a pair of spaced hinges **12**, as shown in FIG. 3. Cover **10** and base **11** are made of a substantially rigid non-conducting material, such as a synthetic resin, and are preferably molded to provide various mounting surfaces, recesses and protuberances, required for installing various components and mechanism for translating movement of cover **10** about the axis **13** of the hinges **12** into resistance variations necessary for motor speed control.

These internal components and mechanism which form no part of the present invention are shown and described in a copending United States patent appliaction Ser. No. 496,768, filed Oct. 18, 1965, now Patent No. 3,328,740, and to which reference may be had for a more complete understanding thereof.

It is sufficient for the purposes of this invention to note that the cover **10** is generally rectangular in plan and has its long dimension parallel to the hinge axis **13**, which dimension is preferably at least one and one-half times the transverse dimension. The actual length along the hinge axis may be conveniently of the order of twice the width of a normal shoe. This aspect ratio provides convenience in handling and considerable latitude for positioning the foot in any one of several good operating positions. In a word, an actuator thus dimensioned is non-critical with respect to foot position.

It will further be noted that the cover is purposely made to have a prominently large exposed area and overhangs the base **11** on both sides **14** and **15**, as well as along the front edge **16**. The top surface is concavely curved downwardly toward the front edge **16** to provide a minimum vertical height along this front edge. This increases the probability that the foot, in probing by touch for the controller, will normally contact the cover, which is desirable for quick positioning.

As shown best in FIG. 6, springs **17** are pressed over raised bosses **18** on the inner surface of the cover **10**. The spring dimensions are such that the springs **17** hold themselves in place by helical contraction around the bosses **18** and are thus self-retaining. As the cover is closed by pivoting about the hinge axis **13**, the springs **17** are guided to their flat seats **19** by the sides of conical recesses **20** formed in the base **11**.

The springs **17** provide a biasing force to return the cover **10** to its initial unoperated position when the operator's foot is removed from the cover. This initial position of the cover **10** may be adjusted and fixed by a screw fastener **21** of the self-locking type threadedly engaging an insert **22** in cover **10** and having a head engaged by a dished washer **23** movably disposed in a recessed opening **24** in the base **11**, as seen best in FIG. 5. The screw fastener **21** may be reached for adjustment by a screwdriver through a slit **25** made in a resilient friction pad **26** applied to the bottom surface of the base **11**. It will be noted that the screw-fastener **21** is retained in a captive condition within the recess **24** even though unthreaded from the insert **22**. However, a preferable form of this device may omit the slit **25** in order to purposely provide a tamper proof structure. In this case the adjustment of the screw fastener **21** is made at the factory prior to affixing the imperforate pad **26** to the base **11**, the pad **26** thus also serving to prevent subsequent tampering with the factory adjustment.

As the cover **10** is pressed downwardly against the bias of springs **17**, the overhanging sides **14** and **15** of the cover telescope with the corresponding sides **27** and **28** of the base **11**. A rib **29** formed on the inner surface of cover **10** also telescopes with a rib **30** formed on the base **11**. These telescoping parts provide safety against inadvertent human access to the interior of the controller which contains live electrical elements and, at the same time, these parts provide sufficient access for ventilating air to flow for dissipating the heat generated in the resistance element.

Bottoming of the cover occurs when the rib **29** contacts the base **11**.

From the above, it will be perceived that there is provided according to this invention, a foot controller having a prominently exposed actuator in the form of a hinged telescoping cover for quick and easy engagement by the foot with simple but effective means for biasing and adjusting said cover to an initial unoperated position.

Having thus described the nature of this invention, what is claimed herein is:

An operator-actuated speed controller for electric motors comprising; a molded base of generally rectangular shape in plan view, a molded cover for said base also of generally rectangular shape in plan view, said base and cover each having one of its respective edges positioned in mutually abutting relation along a single straight line extending in the direction of the longer dimension, hinge means secured to said base and cover and defining a hinge axis coincident with said line, said cover having its other edges overlapping the other respective edges of the base in plan to provide a large exposed cover area relative to the base, said cover having a top external surface which, beginning at the top of the hinged edge, is curved convexly downwardly away from said edge toward the opposite edge to establish the minimum vertical height of the controller along said opposite edge, means biasing the cover to a raised position and means opposing the biasing means and adjustable from the exterior of the controller to establish an initial rest position for the cover.

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