

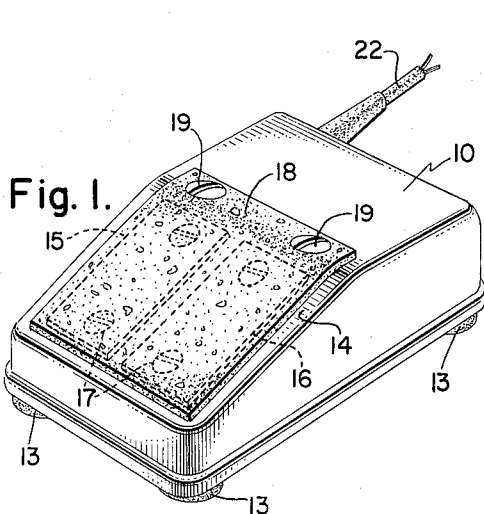
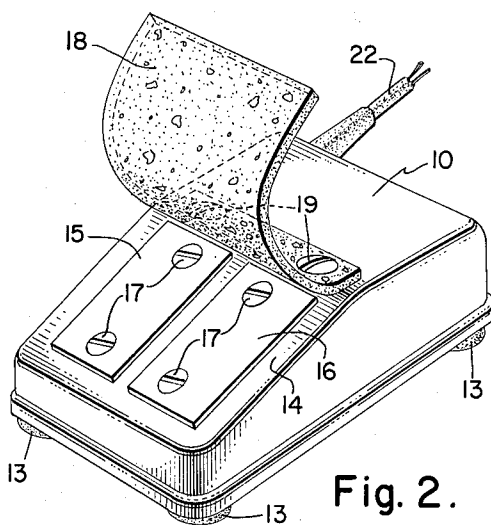
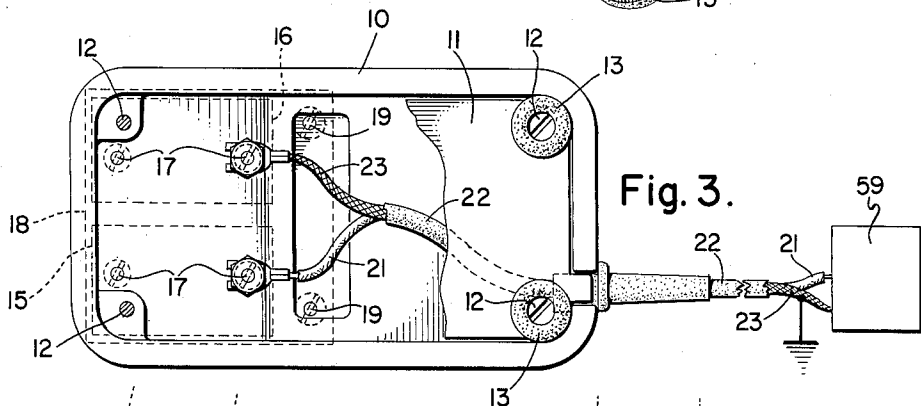
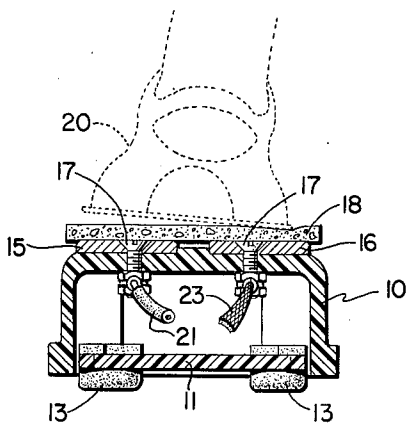
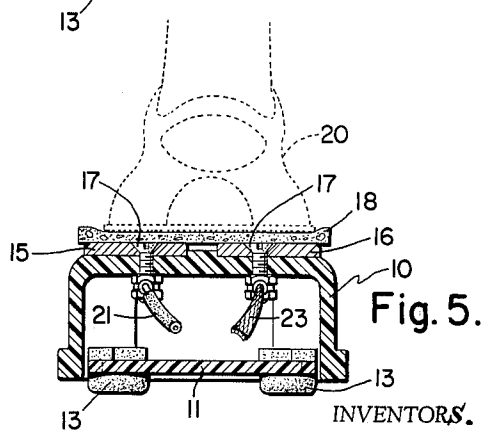
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3,225,274

CAPACITANCE TYPE FOOT CONTROLLER

Filed May 21, 1962



WITNESS

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3,225,274

CAPACITANCE TYPE FOOT CONTROLLER

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1 Claim. (Cl. 317-249)

This invention relates to a foot controller for use with sewing machines powered by electric motors the speeds of which are controlled by the space transmission of electromagnetic energy.

A system for controlling the speed of a series commutator motor by utilizing the stray 60 cycle hum field from house wiring picked up by the operator's body as the control energy, is shown and described in the United States patent application Serial No. 135,250, filed August 31, 1961. Referring to FIG. 5 of the above application it will be noted that plate 57 is used to couple the operator's foot to the input of the amplifier 59. With this arrangement the operator is required to hold her foot at various small distances from the plate for the various speeds desired. While this system is functionally satisfactory, it is fatiguing to the operator and is somewhat too critical with respect to foot position.

In an effort to provide an improved control, the foot controller of the present invention has been devised.

It is, therefore, an object of this invention to provide a foot controller having easily obtainable and differentially variable space coupling between the operator's foot and the input of a circuit for controlling the speed of a sewing machine, which controller shall provide a rest position for the foot for all speed settings.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention from which the several features of the invention and the advantages attained thereby, will be readily understood by those skilled in the art.

In the drawings, FIG. 1 is a perspective view of the device illustrating an embodiment of this invention.

FIG. 2 is the same as FIG. 1 except that one element has been displaced from normal position to clarify the construction.

FIG. 3 is a bottom plan view of the device of FIG. 1 with part broken away to reveal the electrical connections.

FIG. 4 is an end elevation view partly in section showing the foot position for slow speed setting.

FIG. 5 is similar to FIG. 4 except that the foot position is for high speed setting.

Referring now to the drawings, the foot controller comprises a hollow base 10 made preferably of molded insulation material with a bottom cover plate 11 of the same material secured by screws 12 which also secure rubber bumper feet 13 for non-marring contact with any supporting surface.

The base 10 is formed with a ramp portion 14 to the surface of which is secured laterally spaced coplanar plates 15 and 16 of electrically conducting material such as brass by means of countersunk screws 17. The plates 15 and 16 are spaced apart so that the total lateral span approximates the width of the average shoe as seen in FIGS. 4 and 5.

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Overlaying the plates 15 and 16 is a flap or pad 18 of resilient dielectric material such as foam rubber, cork or synthetic plastic material secured to the base 10 by any suitable means such as screws 19. The function of the pad 18 is to serve as a dielectric cushion for the operator's foot giving a rest position at all times but at the same time permitting variable relative spacing between the plates 15 and 16 and the operator's foot 20 by voluntarily shifting the weight and thus variably compressing the material of the pad 18 as shown in FIGS. 4 and 5.

As shown in FIG. 3, plate 15 is connected to the center lead 21 of a concentric shielded cable 22 while plate 16 is connected to the outer shield 23. Lead 21 becomes the input to the amplifier 59 referred to above while shield 23 is connected to ground.

In FIG. 4, the operator's foot 20 is positioned to selectively compress the pad 18 in the area adjacent the grounded plate 16 thus capacitatively coupling more of the operator-picked-up energy to ground than to the signal input plate 15. This corresponds to minimum or low energy input to the amplifier 59 and results in zero speed or low speed of the motor being controlled, depending on the amount of the differential compression. To increase the motor speed the operator shifts the weight of her foot 20 to favor compression of the pad 18 in the area adjacent the signal input plate 15 as shown in FIG. 5. This increases the relative capacitance coupling between the foot 20 and the plate 15, thus increasing the signal input to the amplifier 59 and resulting in increased motor speed.

From the above it will be perceived that there is provided according to this invention a capacitance type foot controller which is simple, inexpensive, has no moving parts and provides motor control by merely shifting the weight from one side to the other of the operator's foot while preserving at all times an easy, cushioned rest position for the foot.

Having thus set forth the nature of the invention what we claim herein is:

An electrical foot controller of the non-conducting capacitance type consisting of a single insulated base, spaced stationary coplanar electrically conducting plates secured to said base, electrical means connecting the coplanar plates together, a resilient non-conducting dielectric pad secured to said base to overlay said plates and form a variably compressible medium responsive to differential pressure applied thereto by relative movement of an external object whereby said object may be positioned in differentially variable spaced insulated relation with respect to said plates thereby to provide a relatively variable capacitance effect between said object and said plates.

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