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Hauenstine

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[54] **RECTILINEAR POTENTIOMETER AND SWITCH**

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[51] **Int. Cl.** **H01c 9/08**

[58] **Field of Search** 338/153, 176, 178, 179, 338/183, 184, 197, 198, 199, 200

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[57] **ABSTRACT**

An electrically insulating means cooperates with at least one of a collector and resistance strip to provide a substantially continuous sliding surface for an electrical contact means to provide a switch in combination with a variable resistor.

A housing of the potentiometer includes a cup-shaped member molded as a single unit from an electrically insulating material to provide structural support for the various elements of the resistor-switch combination.

10 Claims, 2 Drawing Figures

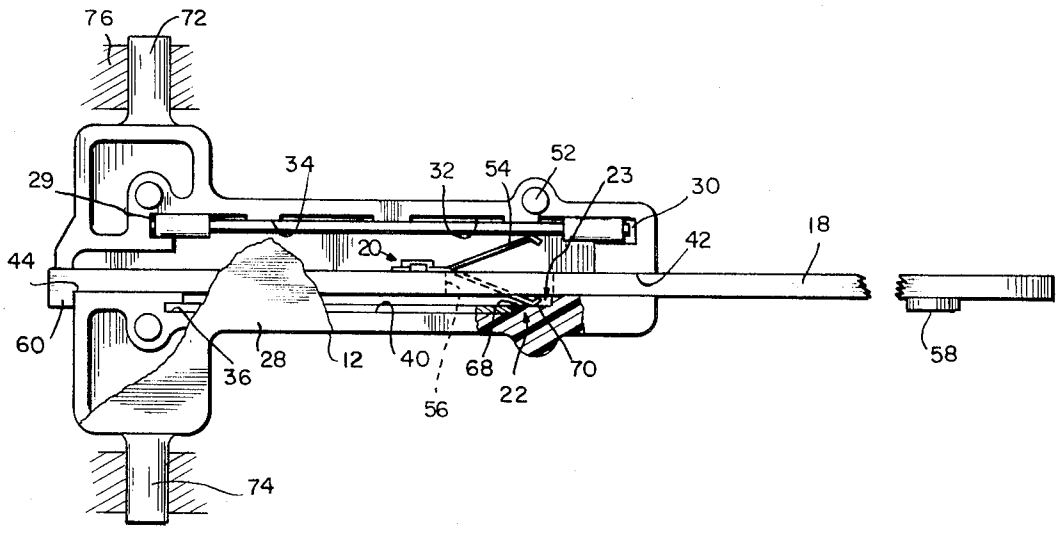
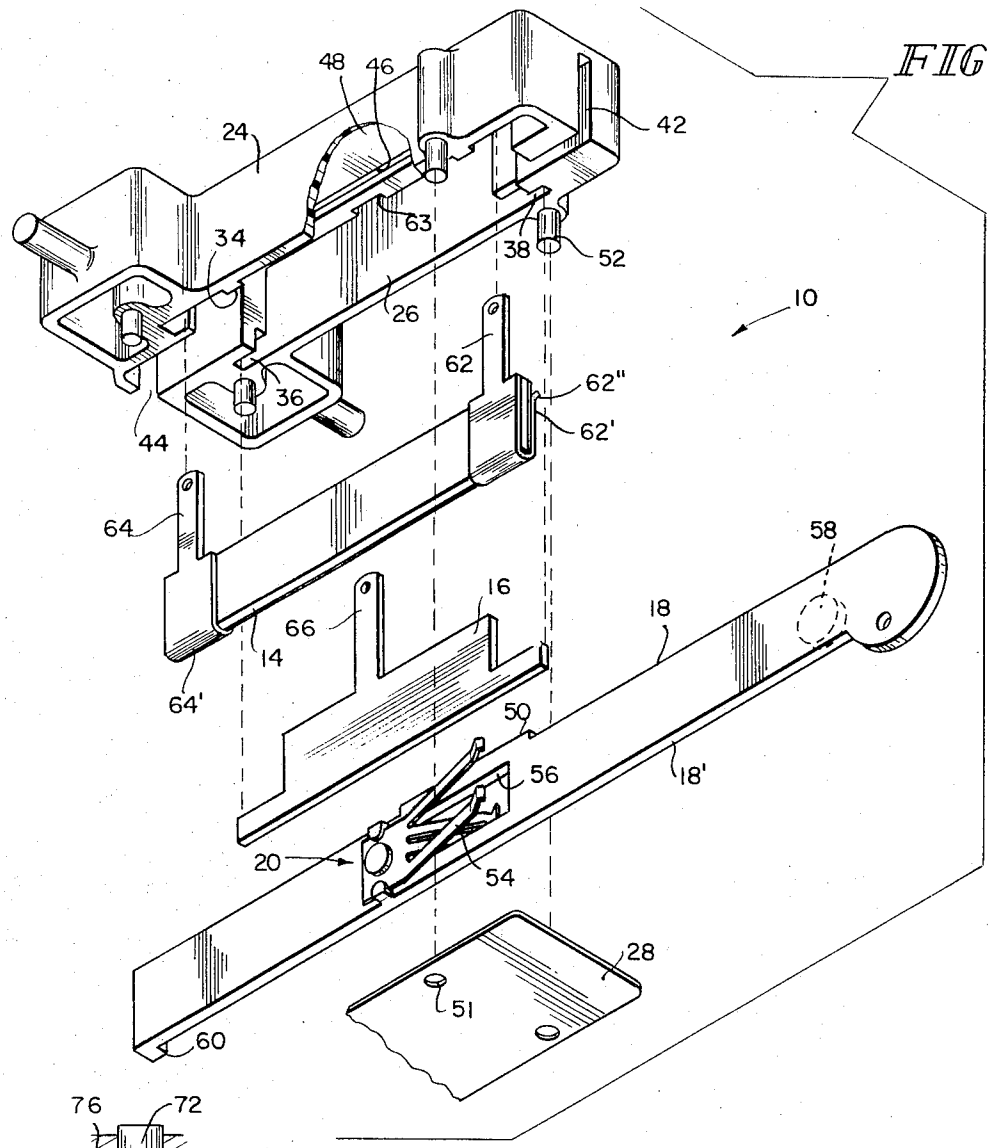


FIG. 1


48
46
24
42
63
34
38
52
26
10
62
62"
36
62'
44
64
58
16
66
18
14
64'
50
56
18'
20
54
28
51
60

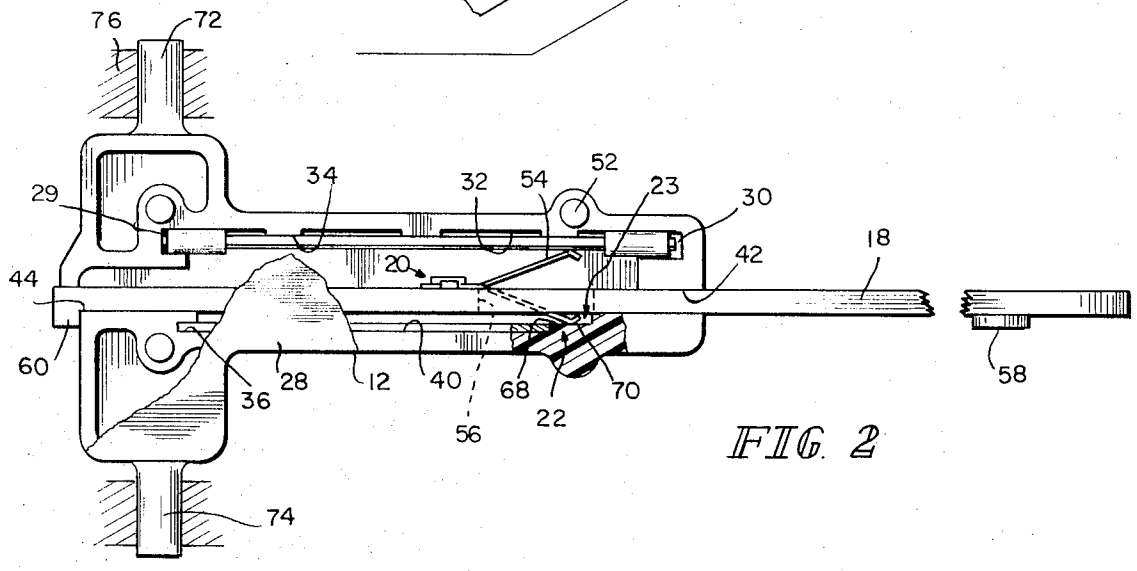

76
72
34
32
54
52
23
30
29
18
20
42
44
60
36
28
12
40
68
70
58
56
22
74

FIG. 2

RECTILINEAR POTENTIOMETER AND SWITCH

Generally speaking, the present invention relates to a linear potentiometer switch combination which comprises a housing, apertures in opposed ends of said housing, a collector and resistance strip carried in the housing in spaced substantially parallel relationship, a slider extending through said apertures and movable between the collector and resistance strips, electrical contact means carried by the slider engaging the collector and resistance strips, and an electrical insulating means cooperating with at least one of said collector and resistance strips to provide a substantially continuous sliding surface for said electrical contact means, engagement of the electrical contact means with the electrical insulating means providing the switch of the linear potentiometer - switch combination.

The housing is comprised of a rectangular shaped cup-shaped member molded of electrically insulative material as a single unit to include slots receiving collector and resistance strips, ribs supporting at least one of the collector and resistance strips along a side thereof, open ended slots at opposed ends of the cup-shaped member receiving a slider carrying electrical contact means, a groove in the bottom of the cup shaped member maintaining alignment of the slider as it slides therein, apertures in the bottom of the cup shaped member through which electrical terminals connected to the collector and resistance strips extend, and posts extending from edges of walls of the cup shaped member at its open end, the housing further including a cover having apertures engaging the posts and being adapted to close said cup shaped member and aid in trapping the collector and resistance strips and the slider in place.

Potentiometers are being increasingly used where mechanical movements need to be transformed into electrical signals and, where occasion demands it because of styling, linear actuated potentiometers are preferred. Linear potentiometers also have a smooth rate of change in resistance.

There are also occasions when there is a need for a switching function in combination with a potentiometer. For example, in sewing machines, the operator varies the speed of the machine through a foot pedal which operates a potentiometer. It would be highly advantageous to combine a switching function with the potentiometer so that by operating the foot pedal the operator could not only vary the speed of the machine, but also turn it on or off.

In addition it is always desirable to provide a device that is easy to produce and therefore lower in cost.

A feature of the present inventon is, therefore to provide a linear potentiometer - switch combination. Another feature of the invention is to provide a device that is easy to produce. Still another feature of the invention is to provide a linear potentiometer - switch combination wherein an electrical insulating means cooperates with at least one of a collector strip and resistance strip to provide a substantially continuous sliding surface for an electrical contact means engaging the two strips. Yet another feature of the invention is to provide a linear potentiometer - switch combination wherein an electrical insulating member is disposed juxtaposition a collector strip to provide a substantially continuous sliding surface therewith. Yet still another feature of the invention is to provide a housing for a linear potentiometer which includes a cup-shaped member and a cover closing same, the cup shaped member being molded from an electrically insulating material to include in a single unit structural support for the various elements of the resistor-switch combination. These and other features of the invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an exploded view of a potentiometer showing the features of the invention; and

FIG. 2 is a top view of the potentiometer.

Referring now to the drawings there is shown a rectilinear potentiometer switch combination **10** illustrating the features of the invention. In general the combination includes a housing **12** in which there is disposed a resistance strip **14,** a collector strip **16,** a slider **18** which slides between the two strips, an electrical contact means **20** carried by the slider, and an on-off switch **22.**

Housing **12** includes a cup-shaped member **24** having an open end **26** which is closed by a cover **28.** The cup-shaped member is molded from a suitable electrically insulating material such as a plastic to provide as a single unit structural support for the elements of the potentiometer-switch combination. Slots **29** and **30** are provided along an inner wall **32** receiving resistance strip **14.** Also provided along inner wall **32** are a plurality of ribs **34** which bear against a side of the resistance strip to provide further support for the strip. Slots **36** and **38** receive collector strip **16** along an opposed inner wall **40** to maintain the strips in spaced, substantially parallel relation. Apertures **42** and **44,** in the form of open ended slots, are provided for carrying slider **18,** the slides being free to slide lengthwise between the collector and resistance strips. A groove **46** is formed in the bottom **48** of the cup-shaped member in which slider **18** slides through extension **50.** A plurality of posts **52** extend from walls of the cup-shaped member at its open end to which cover **28** is attached through suitable apertures **51,** the posts being "flattened" to hold the cover in place. The cover thus traps slider **18** in slots **42** and **44** and also traps the collector and resistance strips in their slots. Thus cup-shaped member **24** provides, as a single molded unit, support for the elements of the potentiometer.

Slider **18** is comprised of a thin rectangular bar **18'** having an aperture **56** disposed near its center section. The travel of the slide is limited by lugs **58** and **60** engaging the walls of the housing.

Electrical contact means **20** includes a plurality of fingers **54** carried on a side of slider **18.** Some of the fingers engage resistance strip **14,** the others engaging collector strip **16** through aperture **56.**

Electrical terminals **62** and **64** are electrically connected to resistance strip **14** through clips **62'** and **64',** the terminals extending through the bottom of the cup-shaped member **24** through suitable holes. Clips **62'** and **64'** have a lip **62''** which aids in placing the clips in place with respect to the resistance strip **14.** More specifically, strip **14** is positioned in slots **29** and **30** and then the terminals are placed over the strip with the terminal ends being fed through the holes in the bottom of cup-shaped member **24.** The clip ends are then engaged over the strip and allowed to fill the thickness of the slots for good alignment. Terminal **66** is integrally formed with collector strip **16,** the terminal also ex-

tending through the bottom of cup-shaped member **24** through a suitable hole **63.**

Switch **22** includes an electrical insulating means **23** cooperating with collector strip **16** to provide a substantially continuous sliding surface **68** over which electrical contact means **22** may slide. In the illustrative embodiment, electrical insulating means comprises a land **70** formed as part of the inner wall **40** of the cup-shaped member.

In operation, movement of slider **18** causes electrical contact means **22** to slide up and down the lengths of resistance and collector strip **14** and **16,** collector strip **16** serving as electrical ground. As the electrical contact means moves along resistance strip **14,** the resistance output is varied accordingly. When electrical contact means **22** moves off collector strip **16** onto land **70,** the electrical circuit is broken, so that the potentiometer also provides an on-off switching function.

The potentiometer-switch combination may be pivotly mounted through posts **72** and **74** which may be pivotly mounted in a frame **76.**

What is claimed is:

1. A combination linear potentiometer and switch comprising:

a. a housing,

b. apertures in opposed ends of said housing,

c. a collector strip and a resistance strip carried in said housing in spaced substantially parallel relationship,

d. a slider extending through said apertures and movable between said collector and resistance strips and having lugs engaging walls of said housing to limit the travel thereof,

e. electrical contact means carried by said slider engaging said collector and resistance strips, and

f. an electrical insulating means cooperating with at least one of said collector and resistance strips to provide a substantially continuous sliding surface for said electrical contact means, engagement of said electrical contact means with said electrical insulating means providing said switch.

2. The combination according to claim **1** wherein said electrically insulating means comprises a member in juxtaposition with said collector strip at one end thereof.

3. The combination according to claim **2** wherein said member comprises a portion of a wall of said housing.

4. The combination according to claim **1** wherein said slider comprises a thin bar, substantially rectangular in cross-section.

5. The combination according to claim **4** wherein there is an aperture in said bar and said electrical contact contact means includes a plurality of fingers carried by said bar, a number of said fingers engaging one of said collector and resistance strip, the other of said fingers extending through said aperture to engage the other of said strips.

6. The combination according to claim **1** wherein said housing includes a cup-shaped member and a cover closing same.

7. The combination according to claim **6** wherein said cup-shaped member includes slots provided in walls thereof trapping said collector and resistance strips, said apertures comprise slots, and said cover further traps said slider in said slots and further traps said collector and resistance strips in said slots.

8. The combination according to claim **1** further including posts extending from said housing for pivotly mounting said housing to a frame.

9. In a rectilinear potentiometer wherein an electrical contact means slideably engages spaced parallel collector and resistance strips, a rectangular shaped housing comprising:

a. a rectangular cup-shaped member molded of electrically insulative material as a single unit to include:

slots receiving said collector and resistive strips,

ribs supporting at least one of said collector and resistance strips along a side thereof,

open ended slots at opposed ends of said cup-shaped member receiving a slider carrying said electrical contact means,

a groove in the bottom of said cup-shaped member maintaining alignment of said slider as it slides between said collector and resistance strips,

apertures in the bottom of said cup-shaped member through which electrical terminals, connected to said collector and resistance strips extend, and

posts extending from edges of walls of said cup-shaped member at its open end,

b. a cover having apertures engaging said posts, said cover adapted to close said cup-shaped member and aid in trapping said collector and resistance strips and said slider in place.

10. In a rectilinear potentiometer according to claim **9** wherein said cup - shaped member further includes a land in juxtaposition with and cooperating with said collector strip to provide a continuous sliding surface for said electrical contact means whereby a switch is provided in combination with said variable resistor.

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