United States Patent

Howitt

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[54] SLIDE POTENTIOMETER

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[21] Appl. No.: **190,805**

[52] **U.S. Cl.**.....**338/183,** 338/184, 338/199

[51] **Int. Cl.**.....**H01c 5/02**

[58] **Field of Search**.....338/118, 160, 161, 176, 183, 338/184, 194, 198, 199, 131

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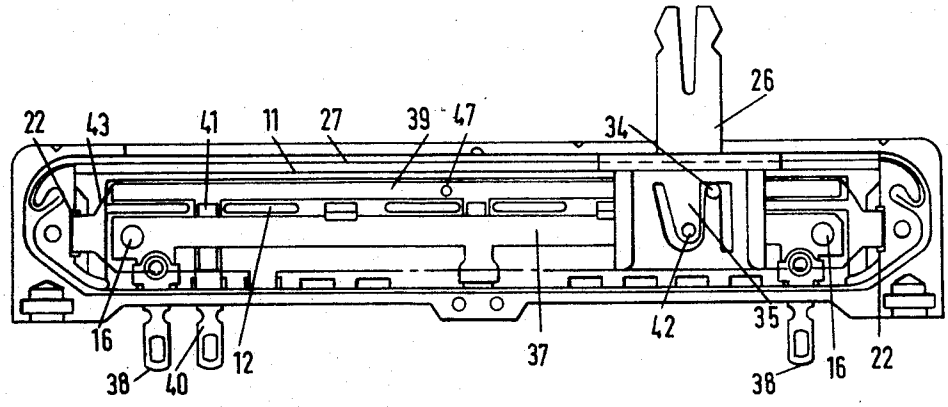
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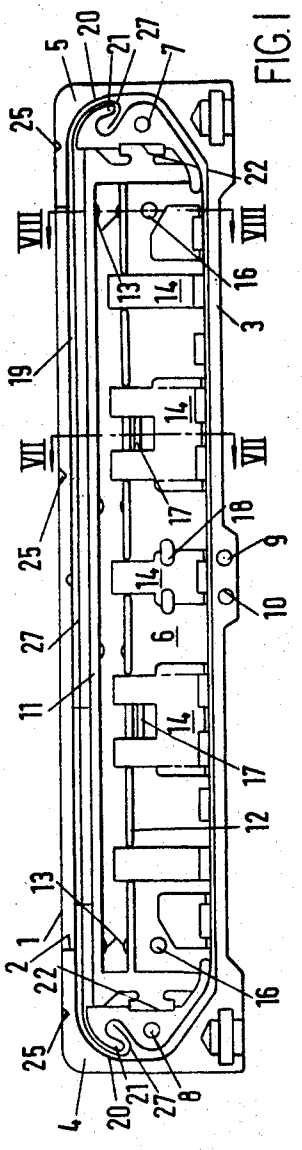
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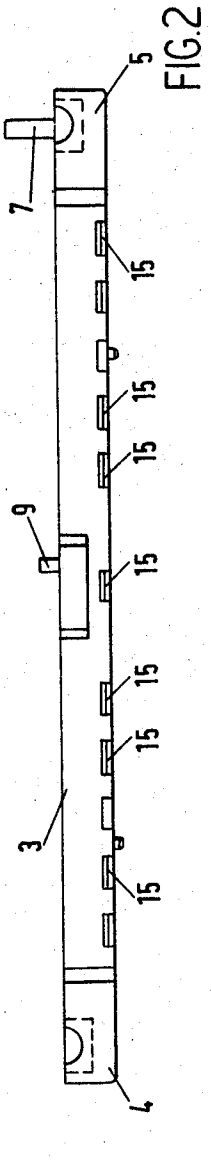
[57] **ABSTRACT**

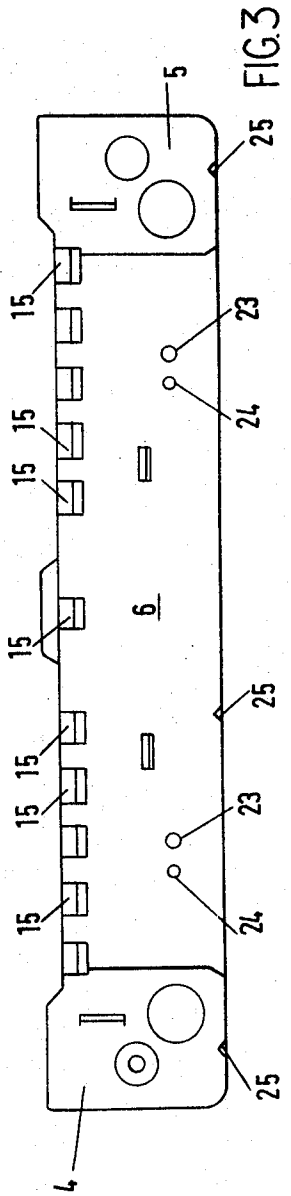
A pair of substantially identical body halves are jointed face to face to leave a slot in one surface for a slider. One or both body halves have a resistive track and a collector track including a center terminal. The slider has sliding contacts to connect the resistive track and collector track. A dust shield is mounted so as to be stationary in the body to prevent ingress of dust through the slot. The slider has cooperating body parts on either side of the dust shield so as to be slidable without moving the dust shield.

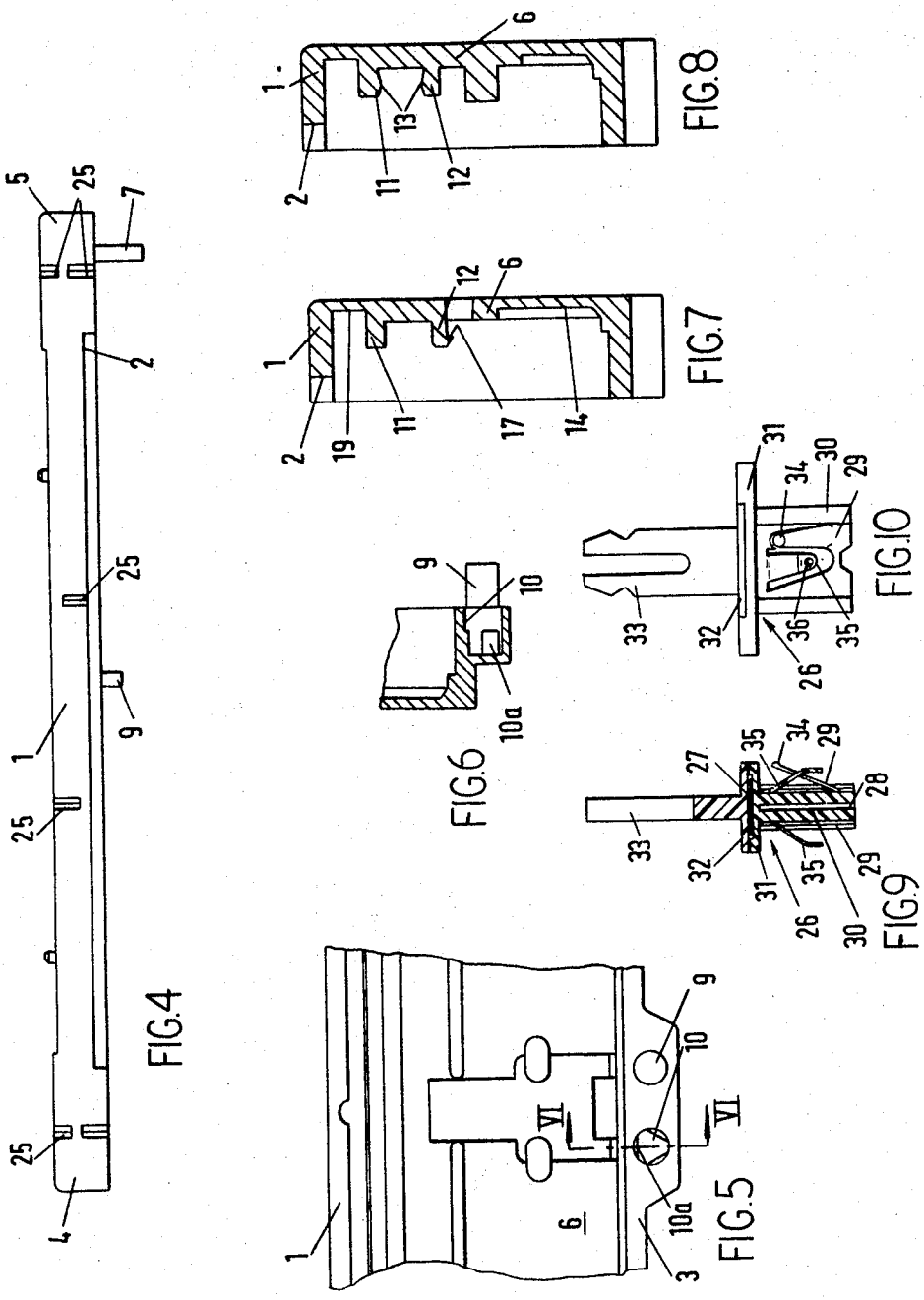
6 Claims, 12 Drawing Figures




FIG. 1
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VIII
VIII
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VII
VII
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FIG. 2
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FIG. 3
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FIG.4
FIG.5
FIG.6
FIG.7
FIG.8
FIG.9
FIG.10

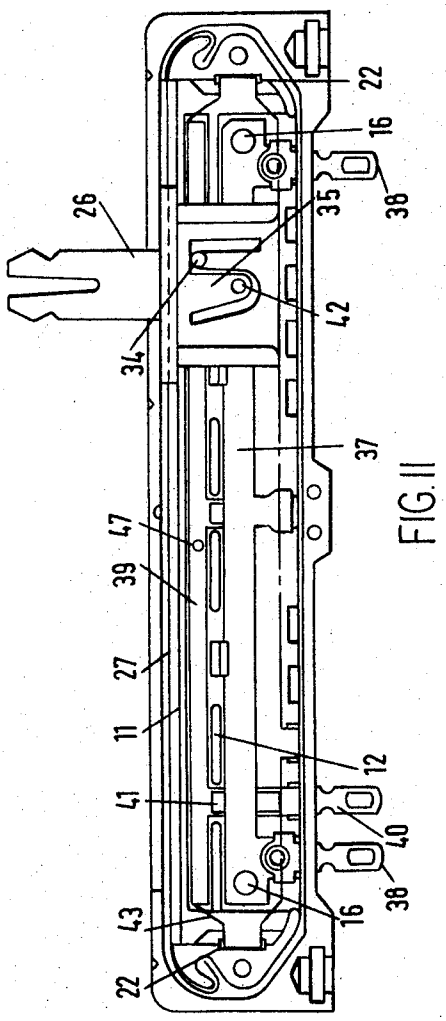

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FIG. 11

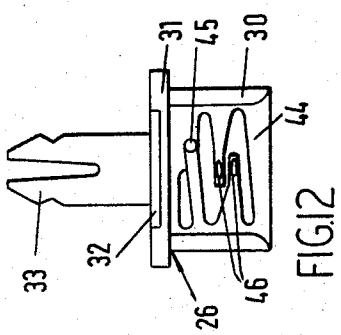

31
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30
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32
46
26

FIG. 12

SLIDE POTENTIOMETER

This invention relates to improvements in slide potentiometers of the type including a resistive track, a collector track including a center terminal, a slider having sliding contacts to connect the resistive track to the collector track, and a dust shield to prevent ingress of dust through a slot in the body through which the slider projects.

The bodies of such potentiometers are generally made from two substantially identical halves joined face to face to leave a slot in one surface of the body. The halves have cooperating formations, generally pins and holes to locate the parts together. Each half of the body may in fact have an individual resistive track and collector track and the slider may carry a movable contact assembly at each side whereby two potentiometers are ganged together.

Accordingly to the present invention, the dust shield is mounted so as to be stationary in the body, and the slider has cooperating body parts on either side of the dust shield.

In addition, the body halves may have some or all of the following useful constructional features:

a. The cooperating formations between the body halves include a pin and a hole located near the center of the body and these holes are of stepped bore to provide easy location and a force fit, the stepping being preferably achieved by including a number of flats in the wall of the bore starting at half depth;

b. A recess for the collector track is formed with pips to provide snap retention of the collector track;

c. A recess for the resistive track has formations for snap retention of the resistive track to hold it in position during assembly and also to augment the heat securing of the ends;

d. Notches on the slotted surface of the body are provided to accommodate optional pressure plates to define any of a variety of indent positions if required;

e. Arrangement of non-handed hole and pin pairs on the outer walls of the body halves for interconnection of other bodies by means of adjacent holes or attachment of side screens, so that the body halves are identical in this respect;

f. Tee slots are provided for accommodation of the ends of a screen between the two potentiometers in the identical body halves; and

g. A plurality of recesses, e.g., seven in number, are provided for accommodating the center terminal at various positions along the collector track.

The invention will be further described with reference to the accompanying drawings, which show a preferred form of slide potentiometer according to the present invention, in which:

FIG. 1 is an elevation of the inside of a body half;
FIG. 2 is a bottom plan view thereof;
FIG. 3 is an elevation of the outside thereof;
FIG. 4 is a top plan view thereof;
FIG. 5 is an enlarged view of a part of FIG. 1;
FIG. 6 is a section on the line VI—VI of FIG. 5;
FIG. 7 is a section on the line VII—VII of FIG. 1;
FIG. 8 is a section on the line VIII—VIII of FIG. 1;
FIG. 9 is an enlarged transverse section through the slider and dust shield;
FIG. 10 is an enlarged elevation of the slider;
FIG. 11 is an elevation of one half of the potentiometer;
FIG. 12 is an enlarged elevation of a modified slider.

The body half illustrated in FIGS. 1 to 8 of the drawings comprises an upper wall 1 having a half slot 2 formed in its inner surface facing the complementary body half so as to define a slot through which a slider 26 (described hereafter with reference to FIG. 9 and 10), will project for operation from outside the body. The body half also has a lower wall 3, end portions 4 and 5 and a side wall 6, the outer surface of which is illustrated in FIG. 3 and the inner surface in FIG. 1.

The two body halves are located together by engagement of a pin 7 on the end portion 5 within a recess 8 on the end portion 4 when two similar halves are brought together. In addition, there is provision of a pin 9 and a recess 10 close to the center of the body along the bottom wall 3, and the pin 9 is arranged to be a force fit in the matching recess on its adjacent half. FIGS. 5 and 6 illustrate that the recess is of a diameter slightly greater than that of the pin 9 to about half its depth so that location is fairly simple, and is then provided with three flatted zones 10*a*, which effectively reduce the diameter of the recess 10 so that entry of the pin 9 beyond the half-way point is achieved against resistance, and results in a force fit.

A housing for a collector track (not shown) with a center terminal at one of seven positions is formed between a continuous rib 11 and a broken rib 12 standing up from the wall 6.

Along these upstanding ribs, there are provided inwardly pointing pips 13 (see along FIG. 8) which provide a snap fit for retention of the collector track in the housing or recess formed between the ribs 11 and 12. It will also be seen that the breaks in the rib 12 are associated with shallow recesses 14 to enable the center terminal integral with the collector track to pass beneath the resistive track houses on the opposite side of the rib 12, and pass out through a selected one of the apertures 15 provided at the junction of the wall 6 and the bottom wall 3. Seven possible positions are thus provided for the center terminal along the length of the potentiometer.

As previously mentioned, the resistive track is located on the opposite side of the rib 12 from the collector track, and a pair of lugs 18 are provided to locate it about the center tapping position, and after assembly, pins 16 are heated or spun over to locate the track in position. In order to assist retention of the track before, during and even after this heat securing, there are provided on the rib 12 a pair of hook formations 17 (see also FIG. 7) under which the track can be located.

Between the zone of the wall 1 having the slot 2, and the rib 11 there is defined a track 19 which acts as a guide for the slider 26, and this slider also runs around a dust shield 27 in the form of a strip which is looped round through track portions 20 formed in the end portions 4 and 5. The ends of the shield 27 are secured simply by hooking around respective abutments 21; other ways of securing the shield 27 can be envisaged.

In cases where the two halves of the body each contain a separate potentiometer, there may be a need to provide a screen or shield between the two halves, and a pair of tee slots 22 are provided, one in each of the end portions 4 and 5, to anchor the ends of this screen or shield. The slider 26 has a recess 28 so that it can straddle this shield or screen, and carries one set of moving contacts 29 on each side of it.

The slider 26 (FIGS. 9 and 10) has a body 30 having an integral flange 31, which runs in the track 19 (FIG. 1). A plate 32, integral with a handle 33 for moving the slider, is clipped into a recess in the flange 31 and defines a slot through which the dust shield 27 passes. (This construction could be reversed, the handle having an integral flange running in the track 19, and the body having an integral plate clipped into a recess in the flange.) On each side of the body 30, a contact 29 is mounted which is in the form of a metal sheet from which two projection contact points 34, 35 have been punched out. The upper contact point 34 is intended to engage the collector track, and the lower contact point 35 is intended to engage the resistive track and to carry a carbon contact brush mounted in a hole 36.

Outside of the wall 6, there are provided a pair of holes 23, each of which is associated with a pin 24, and these pins and holes are arranged so that a similar, but reversed body half forming part of an adjacent body can be mated with each half so that a bank of slide potentiometers can be built up. In addition, these pairs of holes and pins serve for the fixing of side screens, if these are required.

The top of wall 1 of the body half is also provided with a series of notches to accommodate optional pressure plates to define any of a variety of indent positions for the slider if these are required. Notches are illustrated at 25. Provision is also made for indent positions internally by use of a hole 47 (FIG. 11) in the collector track into which the contact 34 indents. A variety of positions may be defined in this way.

It is envisaged that the resistive element can be formed with a number of extensions to form tapping positions, and any of these which are not used will be removed before the potentiometer is finally assembled. The center tap position will normally be retained as it provides central location of the element in the body between the lugs **18**.

One half of the complete potentiometer assembly is shown in FIG. **11**. A resistive track **37** extends between the two pins **16**; a terminal **38** is connected to each end of the track **37** and extends out of the body. A collector track **39** is housed between the continuous rib **11** and broken rib **12**. A center terminal **40** at the side of the collector track **39** extends through rib **12**, passes under the resistive track **37**, from which it is separated by an insulating strip **41**, if required, and extends from the body.

The slider **26** slides around the dust shield **27**. The contact points **34**, **35** which are visible in FIG. **11** are those which engage the collector track, and resistive track respectively, of the other body half, the contact point **35** having a carbon contact brush **42**. The two potentiometers housed in the body are shielded from each other by a strip **43** the ends of which are anchored in the tee slots **22**; the strip **43** passes through the recess **28** (FIG. **9**) in the slider **26**.

Various modifications may be made within the scope of the invention. For instance slider **26** can have an alternative metal contact **44** (FIG. **12**) in which three legs have been punched out, the upper leg **45** being intended to engage with the collector track and the lower pair of legs **46** being intended to engage with the resistive track.

I claim:

1. In a slide potentiometer comprising a body consisting of a pair of substantially identical body halves, each body half having a recess cooperating with the corresponding recess in the other body half to form a longitudinal slot, a slider projecting from the body through the said slot, at least one of the said body halves housing a resistive track and a collector track, the said collector track having a terminal, sliding contacts on slider for electrically connecting the resistive track to the collector track, and a dust shield for preventing ingress of dust through the said slot, the improvement that the duct shield is mounted to be stationary in the body and that the slide comprises cooperating body parts located on each side of the dust shield to define a through way whereby the slides may be moved along the slot without disturbing the dust shield.

2. A slide potentiometer as set forth in claim **1**, in which the body portions are joined by cooperating formations including a pin and hole connection near the mid point of the body, the hole being of stepped bore to provide ease of locations and a firm fit.

3. A slide potentiometer as set forth in claim **2**, in which the bore of the hole is provided with a plurality of flatted areas from above half depth to the bottom of the hole.

4. A slide potentiometer as set forth in claim **1**, comprising unitary ribs in the body half to define a recess for the collector track, the said ribs being formed with snap retention pips for holding the collector track in position.

5. A slide potentiometer as set forth in claim **1**, comprising formations defining a recess for the resistor track, locating pins for securing the ends of the resistor track and snap retention means on at least one of the said formations intermediate the ends of the recess for retaining the resistive track in position.

6. A slide potentiometer as set forth in claim **1**, in which at least one of said body halves has a plurality of spaced recesses for accommodating the center terminal of the collector track at any one of a plurality of spaced positions.

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