United States Patent [19]

Meylan-Rochat

[11] **3,772,629**

[45] **Nov. 13, 1973**

[54] **POTENTIOMETER**

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[22] Filed: **Sept. 19, 1972**

[21] Appl. No.: **290,348**

[30] **Foreign Application Priority Data**

Sept. 20, 1971 Switzerland 13740/71
May 9, 1972 Germany ..... P 22 23 409.9

[52] **U.S. Cl.** **338/154**
[51] **Int. Cl.** **H01c 5/00**
[58] **Field of Search** 338/154

[56] **References Cited**

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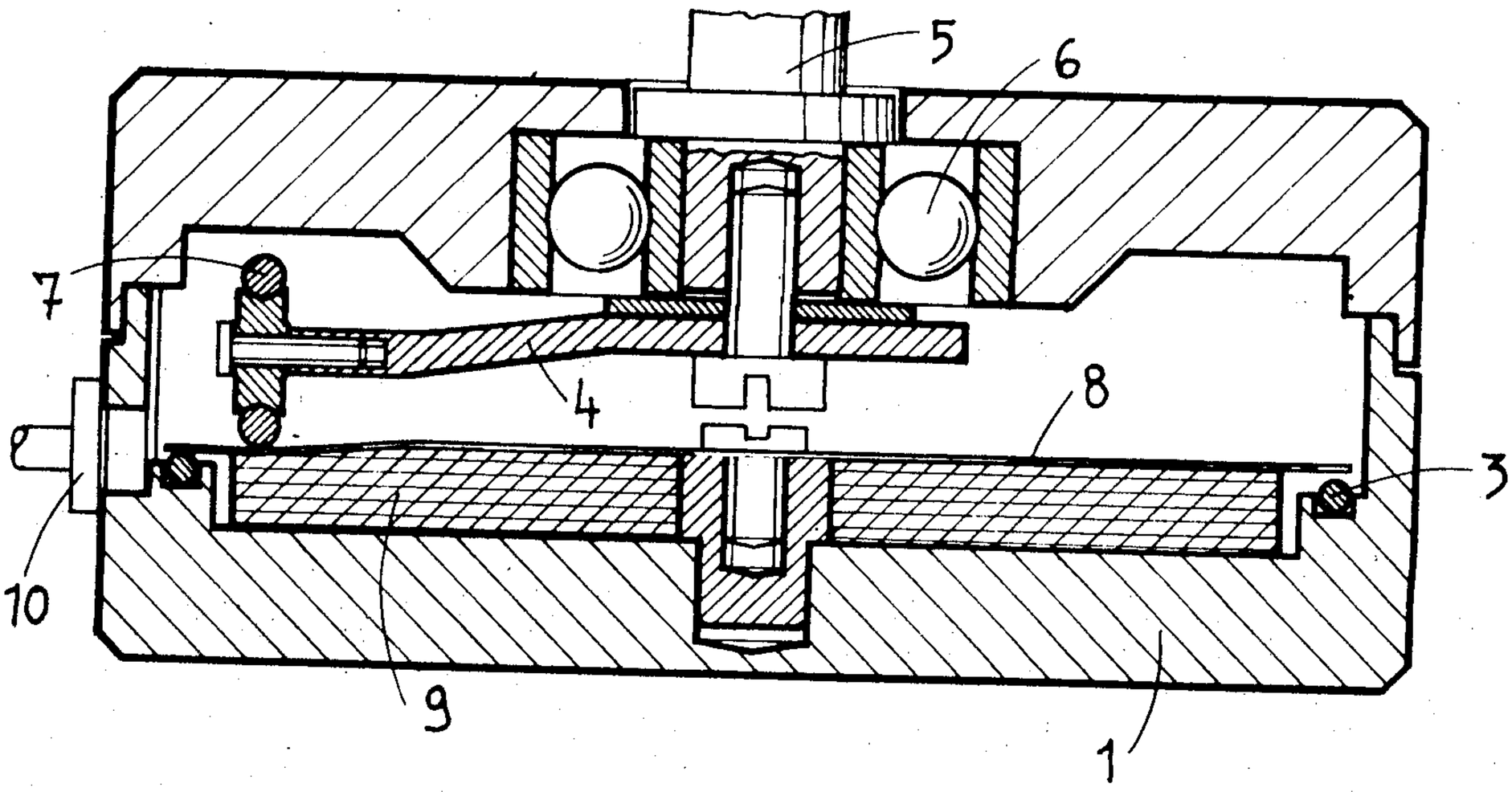
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Assistant Examiner—D. A. Tone
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[57] **ABSTRACT**

A potentiometer comprising a slider and a resistance presenting a conductive track, as well as an intermediary member having the shape of a resiliently deformable sheet interposed between the slider and the conductive track, at least a portion of this sheet, situated opposite the track, being conductive, wherein the sheet rests on a cushion made of flexible and compressible material which maintains it at a distance from the conductive track and which is elastically deformed under the effect of the pressure exerted on the sheet by the slider, so that the portion of the sheet adjacent the slider comes in contact with the track.

7 Claims, 3 Drawings



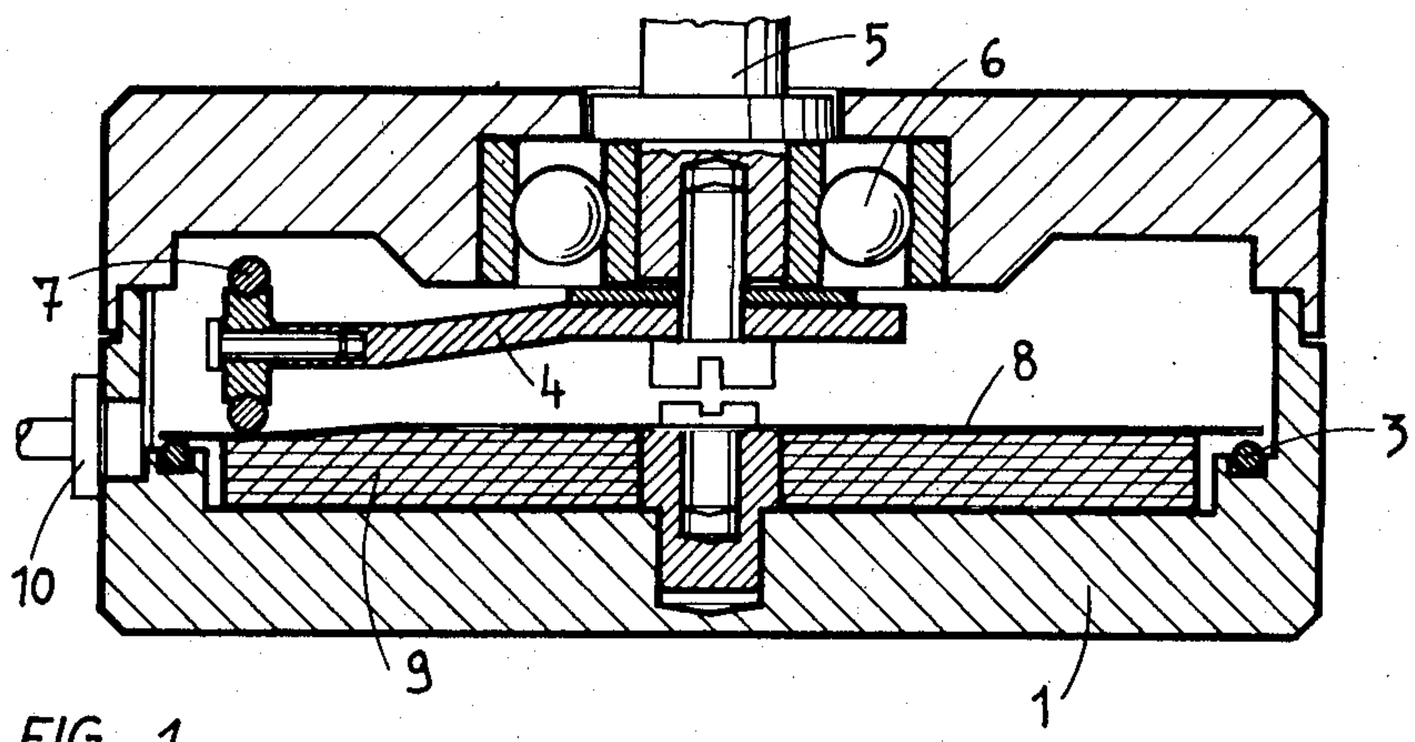


FIG. 1

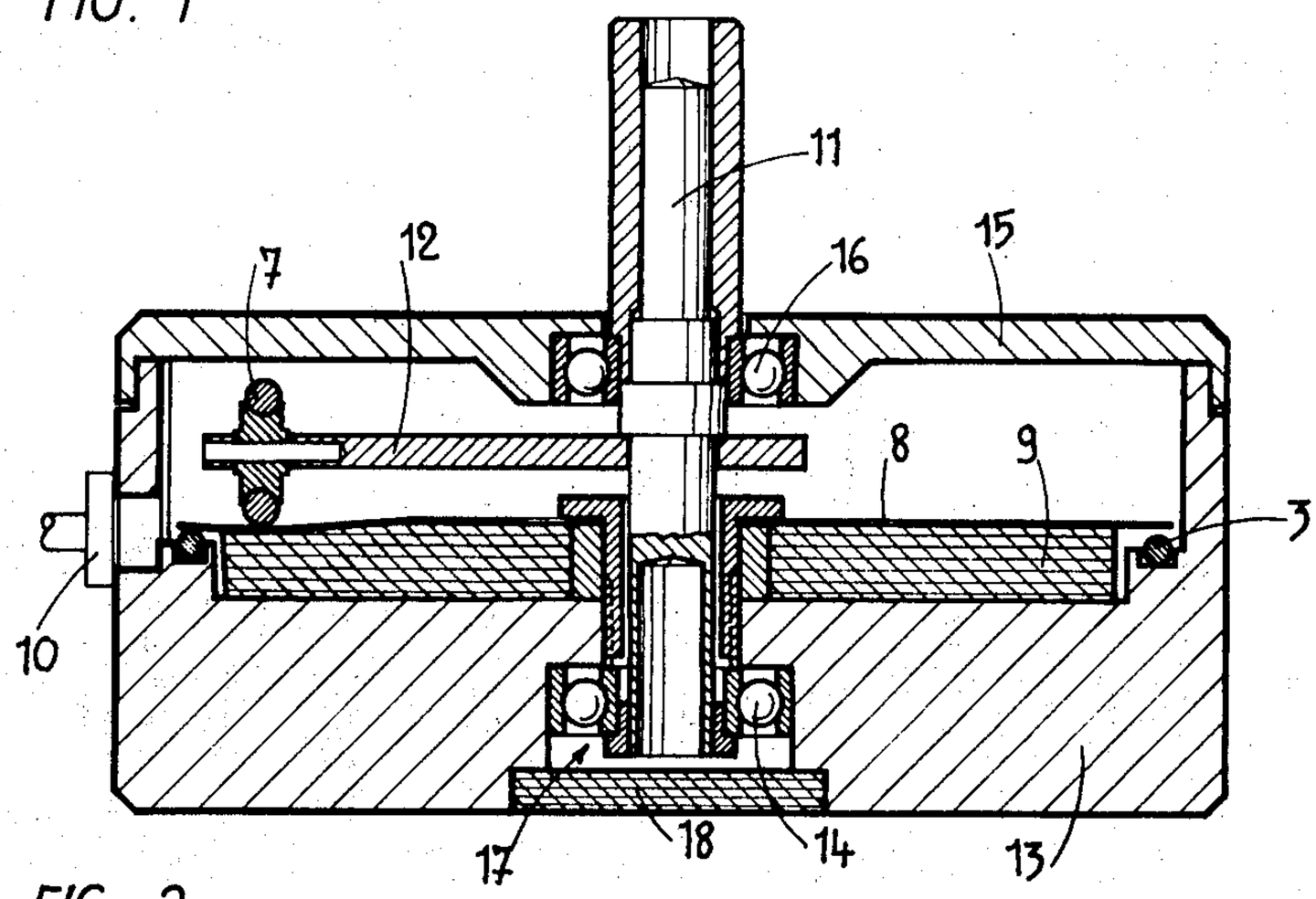


FIG. 2

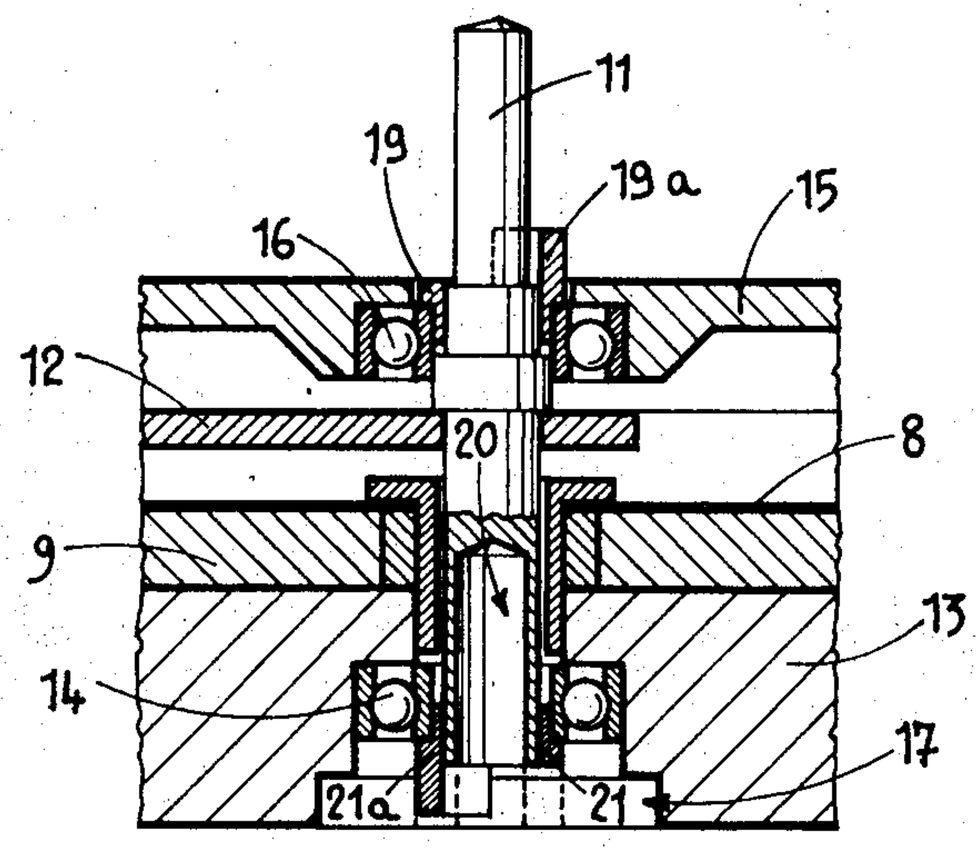


FIG. 3

POTENTIOMETER

The present invention relates to a potentiometer comprising a slider and a resistance provided with a conductive track as well as an intermediary member having the shape of a resiliently deformable sheet, interposed between the said slider and the said conductive track, at least a portion of this sheet, situated opposite the said track, being also conductive.

This potentiometer is characterized by the fact that the said sheet rests on a cushion made of flexible and compressible material which maintains it at distance from the conductive track and which is elastically deformed under the effect of the pressure exerted on the said sheet by the slider, so that the portion of the sheet adjacent to the slider comes in contact with the said track.

The drawing shows, by way of example, two embodiments of the object of the invention and one modification.

FIGS. 1 and 2 are axial sectional views of two different embodiments of a potentiometer, and

FIG. 3 is an axial sectional view of a detail of a modification.

The potentiometer represented in FIG. 1 comprises a cylindrical casing, made of plastic material, constituted by a main body 1 in which is engaged a cover 2. The booy 1 carries an annular coiled resistance 3 with which cooperates, indirectly, a rotative slider constituted by a radial arm 4 supported by a shaft 5 rotatably mounted, by means of a rolling bearing 6, on the cover 2. The shaft of this slider is coaxial to the resistance 3. The arm 4 of the slider carries, at its free extremity, a rotative roller 7 bearing on a metallic disc 8 coaxial to the shaft 5, having the shape of a thin elastic sheet, supported by a cushion 9 made of flexible and compressible material, for instance rubber, also coaxial to the shaft 5, located inner the resistance 3. The sheet 8 extends beyond the cushion 9 and extends, by its periphery, above the resistance 3, while the roller 7 bears on this sheet within the resistance with respect to the center of the apparatus, in the vicinity of the periphery of the cushion 9.

Owing to the presence of the cushion 9, which returns resiliently the sheet 8 into its rest position, in which it is plane and situated at a slight distance from the resistance 3, the sheet can be choosen very thin, that permits, opposite the place where is the roller 7, to incurve itself while taking the shape of the roller, and thus to come in contact with the resistance substantially on a point, that increases the degree of resolution of the potentiometer, which is expressed by the value of the minimum displacement of the slider able to produce a sensible variation of the resistance.

The connecting electric threads of the potentiometer, which are not represented, enter into the casing 1–2 through a sleeve 10 and are connected, two at the resistance 3 and a third one to the circular sheet 8.

The embodiment of FIG. 2 distinguishes from the first one principally by the fact that the shaft, designated by 11, operating the arm 12 of the slider, is extended under this arm and enters into the body 13 of the casing in which it is supported by a rolling bearing 14. It is moreover supported by the cover 15 of the casing through the intermediary of a rolling bearing 16, as in the first embodiment.

The recess, designated by 17, of the body 13 of the casing in which is mounted the rolling bearing 14 is closed by a cover 18.

The modification of FIG. 3 distinguishes from the second embodiment by the fact that the front extremity of the shaft 11 is provided with a sleeve 19, mounted on the shaft, provided with an extension 19*a* having the shape of a segment extending on 180°, while its rear extremity, which is hollow at 20, is rigid with a sleeve 21, also mounted on the shaft, provided with an extension 21*a*, having the shape of a segment extending on 180°.

This arrangement permits to mount several potentiometers as a set, the front extremity of the shaft 11 of each of them, excepted the end potentiometer of the set, being engaged in the recess 20 of the adjacent potentiometer. The mutual engagement of the extensions 19*a* and 21*a* has for effect that the shaft of each potentiometer is rigid with the shaft of the adjacent potentiometer.

The present potentiometer can serve either for varying the value of a resistance, i.e. the resistance 3, or for operating as a measuring instrument of the angular position of a rotative movable element, the information being given by the instantaneous value of the resistance. In this last case, especially, a high degree of resolution of the potentiometer is desired.

The invention is not limited to the potentiometers as disclosed and represented but can be applied, for instance, to potentiometers in which the resistance, which is not coiled, can be constituted by a mere track of carbon, or by a conductive plastic material. The intermediary sheet, interposed between the conductive track of the resistance and the slider can be not plane, but, may be, conical, or cylindrical, provided it is able to be elastically deformed.

The potentiometer can also not be of the type with an annular resistance and with rotative slider, but also of the type with a rectilinear resistance and with a slider which is movable in a translation motion. In this case, for instance, the metallic blade can protrude on both sides of the resistance and be supported, under its protruding portions, by two elastic cushions, parallel to each other, or by one elastic cushion in which the resistance will be embedded.

In the examples represented, the resistance is circular, so that its value varies linearly, proportionally to the rotation of the slider. As a modification, the shape of the resistance can be different, and have for instance the shape of a spiral, so as to give an information which is not directly proportional to the rotation of the slider.

What I claim is:

1. Potentiometer comprising a slider and a resistance presenting a conductive track, as well as an intermediary member having the shape of a resiliently deformable sheet, interposed between the said slider and the said conductive track, at least a portion of this sheet, situated opposite the said track, being also conductive, characterized by the fact that the said sheet rests on a cushion made of a flexible and compressible material and which maintains it at distance from the conductive track and which is elastically deformed under the effect of the pressure exerted on the sheet by the slider, so that the portion of the sheet adjacent to the slider comes in contact with the said track.

2. Potentiometer as claimed in claim 1, the slider of which is rotative and the resistance of which is annular and coaxial to the center of rotation of the slider, char-

acterized by the fact that the said cushion is circular and is located inner the said resistance, the intermediary sheet, also circular, being coaxial to the said cushion and protruding beyond the cushion so as to extend, by its periphery, above the said resistance.

Potentiometer otentiometer as claimed in claim **2**, characterized by the fact that the slider comprises a radial arm at the free extremity of which is rotatably mounted a roller bearing on the said sheet.

4. Potentiometer as claimed in claim **2**, characterized by the fact that it comprises a cylindrical casing including its different elements, one of the axial walls of which is traversed by a shaft rigid with the slider, and which serves to operate the slider, this shaft being rotatably mounted in the said wall.

5. Potentiometer as claimed in claim **4**, characterized by the fact that the said shaft traverses the said casing

and is also rotatably mounted in the second axial wall thereof.

6. Potentiometer as claimed in claim **5**, characterized by the fact that one of the extremities of the said shaft is provided with coupling means the shape of which is complementary of the shape the coupling means provided at its other extremity, the whole in such a way as to permit to mount several potentiometers in a set, the coupling means of each potentiometer of the set being meshing with the complementary coupling means of the adjacent potentiometer, so that the shafts of all the potentiometers of the set be rigid with each other.

7. Potentiometer as claimed in claim **1**, the slider of which is rotatable, characterized by the fact that the shape of the resistance is not circular.

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