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(54) Thermally actuated switching device with a calibration nut

(57) A thermally actuated switching device, comprising a base body (2), a electric switch (10), a spring-mounted actuating arm (3) for actuating the switch (10), a setting spindle (9) to set an operating temperature, which interacts with the actuating arm (3), and a calibration nut (15) for calibration of the switch, which is threaded on the spindle (9) and can be rotated with friction while the spindle is kept gripped against rotation. The calibration nut (15) is designed as a riveted nut (15), accommodated in a bore (16) in the base body (2), in such a way that it does not rotate with the spindle when the spindle is turned to set an operating temperature.

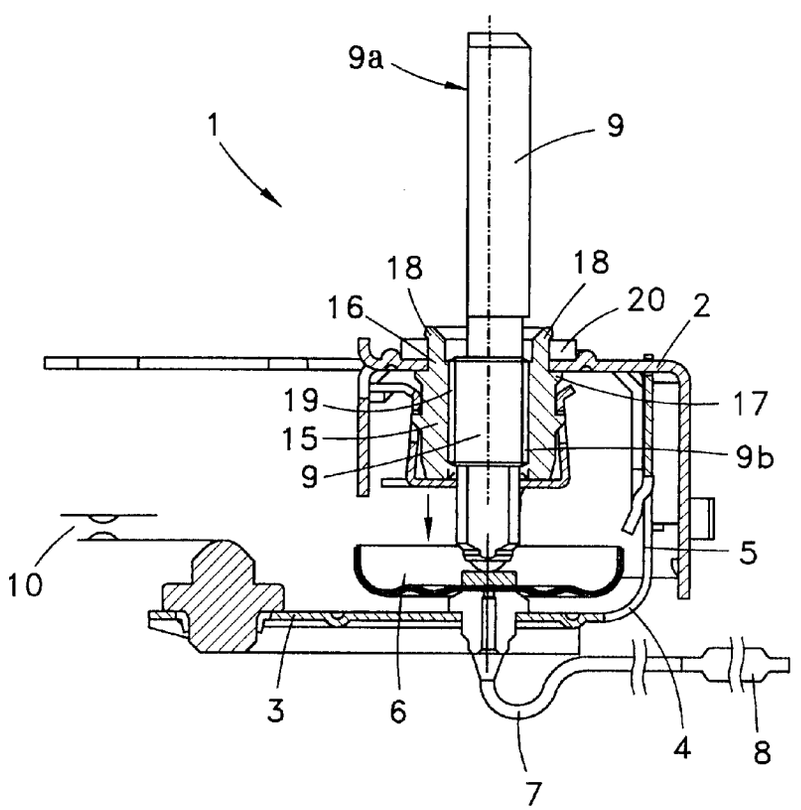

FIG. 1.

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Description

[0001] The present invention relates to a thermally actuated switching device, comprising a base body, an electric switch, a setting spindle, a heat responsive diaphragm, and means for adjustment the switching threshold temperature, according to the preamble of claim 1.

[0002] The switching device described in EP-0 377 169 has a setting spindle for adjusting the desired switching temperature, via the diaphragm which moves an actuating lever arm further away from or closer to the switching position of the electric contacts, and a calibration nut, threaded on the spindle and inserted in the base body, the nut has a circumferential collar, in order to be clamped against the base body, by means of a clamping bracket which is fastened to the base body by screws. The clamping force is so strong that the nut rotates with friction with respect to the base body, when it is turned with the aid of a tool, in order the setting spindle to be axially displaced during the calibration step, whereas it prevents the nut for being moved by the normal turning of the setting spindle when the device is in use. During the calibration step, for advancing the setting spindle, it is gripped in order to prevent its rotation. The calibration nut according to EP-A-0 377 169 requires a large number of components and steps to be assembled into the base body.

[0003] In US-3,899,765, the thermally actuated electric switch has a setting spindle or screw threaded in an insert which is a riveted nut, but it is not a calibration nut because it does not rotate, it only serves to guide the advance of the screw.

[0004] The object of the present invention is a thermally actuated switching device as is defined in claim 1.

[0005] In the device according to the present invention, the calibration nut can be held to the base body in a simple manner by riveting in a bore in the base body. It is a very reliable and simple technique, allowing a good control of the clamping force with which the calibration nut clamps in the edge of the bore in a suitable manner, and there is no need of mounting fits others than the calibration nut itself.

[0006] A washer is interposed between the deformable sections and the base body by suitably selecting the dimensions and the material of this washer, the clamping force with which the riveted nut is clamped to the base body can be controlled, to achieve the reproductivity. In this way, therefore, the amount of force which is required to rotate the riveted nut during calibration is controlled. Furthermore, the presence of the washer makes it possible to take up any axial loads which may arise.

- Fig. 1 shows a partial cross-section of the thermally actuated switching device, according to the invention.

[0007] With reference to the Fig. 1, the device 1 comprises the base body 2 and the actuating arm 3 provided with a hinge axis 4 and a bent section 5, the diaphragm 6 which is connected to a hollow sensor 8 via a capillary line 7, and the setting spindle 9 provided with an intermediate thread 9b interacting with a corresponding thread in the calibration nut 15 which is mounted on the base body 2. The numeral 10 indicates the switch contacts. The temperature threshold value at which the switch 10 is opened and closed can be adjusted with the aid of the setting spindle 9.

[0008] The correct angular position of the setting spindle relative to the temperature indexing, can be calibrated by placing the sensor 8 in a space with the set known temperature and then rotating the calibration nut 15 up to meet the switching on-off. During the rotation of the calibration nut 15, the setting spindle is gripped against rotation, keeping its flat surface 9a, in the same predetermined angular position as shown in Fig. 1. After calibration, a drop of sealing wax indicates that calibration has taken place.

[0009] It is essential that the calibration nut 15, after the calibration step, cannot rotate during normal use of the device, when the setting spindle 9 is turned to set a temperature value.

[0010] According to the invention, the calibration nut 15 is riveted in such a way that it can be rotated only by means of a tool. The riveted nut 15 is arranged in a bore 16 in the base body 2. As a stop, the riveted nut 15 has a shoulder 17 which bears against the base body 2, and a riveting rim 18 which is riveted to the opposite side of the base body 2. The washer 20, made of material deformable, is accommodated in the riveted connection.

[0011] Advantageously, the riveted rim 18 is provided with one slot, in which the special tool for calibration is engaged.

Claims

1. A thermally actuated switching device, comprising a base body (2), an electric switch (10), a spring-mounted actuating arm (3) for actuating the switch (10), a setting spindle (9) to set the operating temperature which interacts with the actuating arm (3), and a calibration nut (15), which interacts with the setting spindle (9), characterized in that the calibration nut (15) is a riveted nut, and can be rotated with friction for advancing the setting spindle (9) during the calibration step.

2. The switching device according to claim 1, characterized in that the riveted nut (15) is accommodated in a bore (16) in the base body (2), and comprises one o more shoulders (17), which bear against the internal surface of the base body (2), and a deformable riveting rim (18), which is riveted on the external surface of the base body (2).

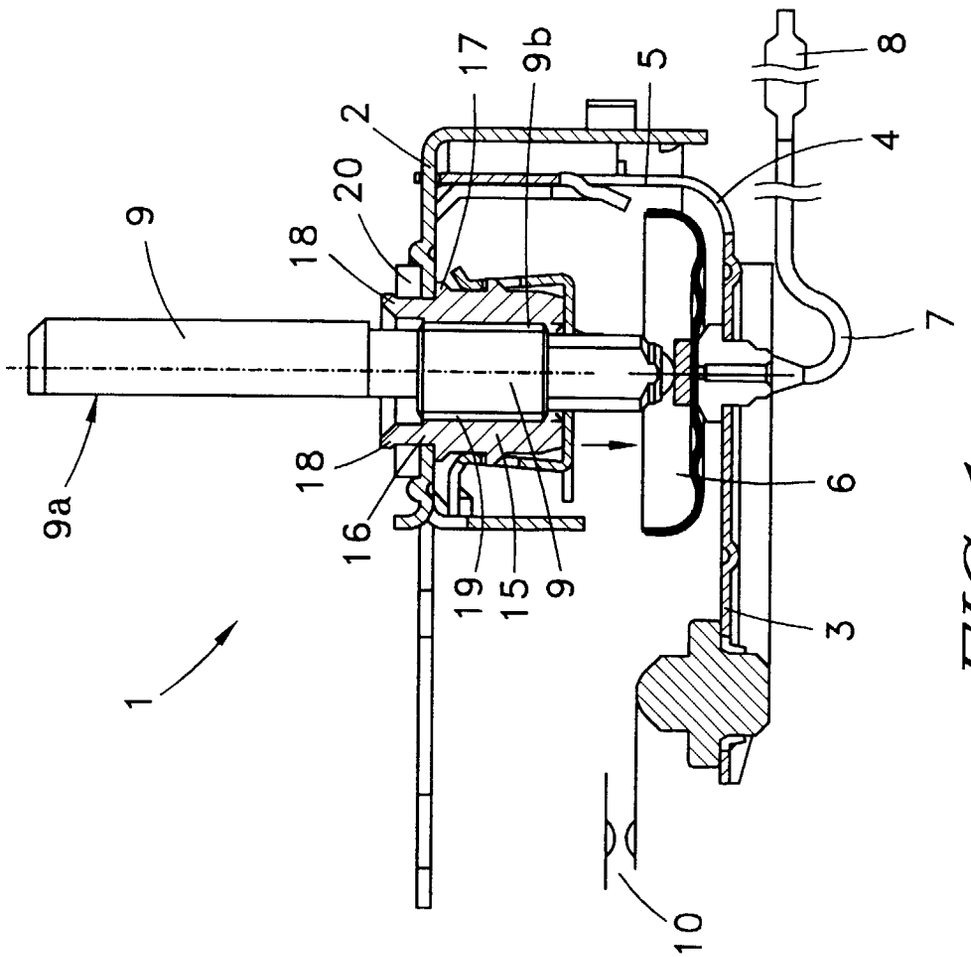

FIG. 1.

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EUROPEAN SEARCH REPORT

Application Number
EP 98 50 0213

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	US 3 899 765 A (DAIGNEAULT JR THEODORE J) 12 August 1975 * column 6, line 3-15; figures 2,3 *	1,2	H01H35/26
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)

H01H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 January 1999	OVERDIJK J.

CATEGORY OF CITED DOCUMENTS

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11-01-1999

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82