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(54) **Thermally actuated switching device with a calibration nut**

Ein wärmebetätigter Schalter, mit einer kalibrierenden Mutter

Un dispositif commutateur thermiquement actionné, avec un écrou de calibrage

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(56) References cited:
EP-A- 0 377 169 **GB-A- 1 148 904**
US-A- 3 899 765

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Description

[0001] The present invention relates to a thermally actuated switching device according to the preamble of claim 1.

[0002] Such a switching device is described in EP-0 377 169 and 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 from 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 an adjustable 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 reproducibility. 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 heat responsive diaphragm, a threaded setting spindle (9) to set the operating temperature which interacts with the actuating arm (3), and a threaded calibration nut (15), which interacts with the setting spindle (9), characterized in that the calibration nut (15) is riveted in a bore (16) of the base body (2) with a clamping force that is so strong that the calibration nut (15) can be rotated with friction for advancing the setting spindle (9) during the calibration step but cannot rotate by the turning of setting spindle during normal use.
2. The switching device according to claim 1, characterized in that the calibration nut (15) comprises one or 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).

Patentansprüche

1. Thermisch betätigte Umschaltvorrichtung, bestehend aus einem Körper (2), einem elektrischen Schalter (10), einem mit einer Feder montierten Betätigungsarm (3) zur Betätigung des Schalters (10), einer wärmeempfindlichen Membrane (6), einer mit einem Gewinde versehenen Einstellachse zur Einstellung der Betriebstemperatur, die mit dem Betätigungsarm (3) zusammenwirkt, sowie einer mit einem Gewinde versehenen, mit der Einstellachse (9) zusammenwirkenden Kalibrier Mutter (15), dadurch gekennzeichnet, dass die Kalibrier Mutter (15) in einer Bohrung (16) des Körpers (2) mit einer Klemmkraft vernietet wird, die so stark ist wie die Kalibrier Mutter (15), und mit Reibung zum Vorschub der Einstellachse (9) während der Kalibrierphase gedreht, jedoch nicht durch Drehen der Einstellachse während der normalen Benutzung verdreht werden kann.
2. Umschaltvorrichtung gemäss Anspruch 1, dadurch gekennzeichnet, dass die Kalibrier Mutter (15) eine bzw. mehrere Stützen (17), welche die Innenfläche des Körpers (2) und berühren, sowie einen genieteten Rand (18) umfasst, der an der Aussenfläche des Körpers (2) vernietet wird.

Revendications

1. Dispositif de commutation à commande thermique, comprenant un corps de base (2), un interrupteur électrique, un bras de commande (3) monté sur ressort pour la commande de l'interrupteur (10), un diaphragme sensible à la chaleur (6), un axe de graduation (9) fileté pour mettre la température d'opération, lequel interagit avec le bras de commande (3), et un écrou de calibrage (15) fileté, qui interagit avec l'axe de graduation (9), caractérisé en ce que l'écrou de calibrage (15) est riveté à un orifice (16) du corps base (2) avec une force de serrage qui est aussi forte que l'écrou de calibrage, (15) et qui peut être tourné avec frottement pour l'avancement de l'axe de graduation (9) pendant l'étape de calibrage, mais il ne peut pas être tourné par une rotation de l'axe de graduation pendant l'usage normal.
2. Le dispositif de commutation selon la revendication 1, caractérisé en ce que l'écrou de calibrage (15) comprend un ou plusieurs appuis (17), lesquels touchent contre la surface interne du corps de base (2) et un rebord riveté (18) lequel est riveté sur la surface externe du corps de base.

