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(54) **Switching element for an appliance, especially for a domestic appliance**

(57) The invention relates to a switching element (1) for an appliance, especially for a domestic appliance, having in combination an adjustment element (2) for adjusting an operation parameter of the appliance by rotating a disc (3) around an axis (4) of rotation and a switching element (5) for switching an operation parameter of the appliance by pressing a pushbutton (6) in the direction of the axis (4) of rotation. To improve the guidance of the pushbutton and to ensure a fixed angular position of it the invention is characterized in that the pushbutton (6) is arranged in a corresponding circular concentric reception (7) in the adjustment element (2) and wherein means (8, 9) are provided for preventing a rotational movement of the pushbutton (6) relative to the switching element (1) around the axis (4) of rotation.

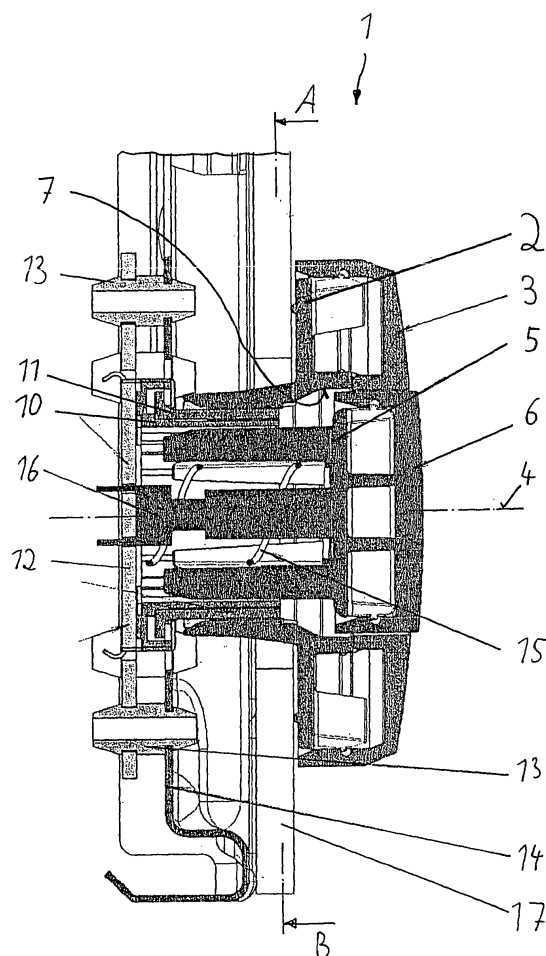


Fig. 1

Description

[0001] The invention relates to a switching element for an appliance, especially for a domestic appliance, having in combination an adjustment element for adjusting an operation parameter of the appliance by rotating a disc around an axis of rotation and a switching element for switching an operation parameter of the appliance by pressing a pushbutton in the direction of the axis of rotation.

[0002] Especially domestic appliances need often a switching element of the kind mentioned above. For example the temperature or intensity of a heating element of a domestic oven can be selected or adjusted by turning a disc to a definite angular position. After the respective position is reached a pushbutton can be pressed to e. g. activate the power supply. In many cases the pushbutton has an inscription which should not vary its position so that it is always legible without problems. So, it is desired that the pushbutton remains in a defined angular position even when the disc is turned.

[0003] On the other hand a good guidance is desired for the disc as well as for the pushbutton.

[0004] Therefore, it is an object of the invention to improve a switching element of the kind mentioned above so that the referred advantages can be obtained. I. e. the pushbutton should always remain in a defined angular position. Furthermore, the pushbutton as well as the disc should be well guided when used. This should become possible in a cheap way and by using standard elements which are usually employed for appliances, especially for domestic appliances.

[0005] The solution of this object according to the invention is characterized in that the pushbutton has a circular perimeter, wherein the pushbutton is arranged in a corresponding circular concentric reception in the adjustment element and wherein means are provided for preventing a rotational movement of the pushbutton relatively to the switching element around the axis of rotation.

[0006] The switching element has preferably two concentric sleeves, wherein one sleeve is stationary and fixed to a carrier element of the switching element and one sleeve is rotatable and fixed with the disk.

[0007] The means for preventing a rotational movement of the pushbutton are preferably at least one groove-like reception in the stationary sleeve and at least one protrusion at the switching element which extends into the groove-like reception. Alternatively, the means for preventing a rotational movement of the pushbutton can be at least one protrusion at the stationary sleeve and at least one groove-like reception in the switching element, wherein the protrusion extends into the groove-like reception.

[0008] Preferably a plurality of groove-like receptions and protrusions are arranged around the circumference of the parts.

[0009] The at least one groove-like reception and the

at least one protrusion extends preferably along the axis of rotation at or in the parts.

[0010] The adjustment element can be connected to the rotatable sleeve by means of at least one protrusion and at least one groove-like reception in which the at least one protrusion extends.

[0011] The two concentric sleeves can be parts of an encoder.

[0012] The carrier element can be connected by connection means to a switch panel of the appliance. The disk can be connected with the adjustment element by means of a snap-on connection. Also, the pushbutton can be connected with the switching element by means of a snap-on connection.

[0013] The pushbutton can be held resiliently in an axial end position by means of a spring element; preferably, the spring element is a coil spring.

[0014] The switching element can be connected with a switch at the axial end being remote from the pushbutton.

[0015] In the drawings an embodiment of the invention is depicted.

FIG 1 shows a cross sectional side view through a switching element of a domestic oven and

FIG 2 shows the sectional view A-B according to FIG 1.

[0016] In the figures a switching element 1 of a domestic oven is shown by which an operation parameter of the domestic appliance can be adjusted and activated. For adjusting the parameter an adjustment element 2 is employed. The adjustment element 2 has a disk 3 which can be rotated around an axis of rotation 4. By doing so, the parameter is adjusted to a desired value, e. g. the intensity or power of a heating element of the domestic oven. On the other hand an operational parameter can be switched on and off by a switching element 5 which has a pushbutton 6.

[0017] As can be seen in the synopsis of FIG 1 and FIG 2 the pushbutton 6 has a circular perimeter. It is arranged in a corresponding circular concentric reception 7 in the adjustment element 2.

[0018] The switching element 5 is connected to a switch panel 14 of a control unit which is part of the appliance. More specifically, the switch panel 14 bears a carrier element 12 which is connected with the switch panel 14 by suitable means. In the embodiment according to FIG 1 connection means 13 are employed which function as spacers which not only fix the carrier element 12 to the switch panel 14 but also hold it in a fixed relative position to it. Also a screw connection can be employed as connection means.

[0019] The carrier element 12 bears a switch 16 and other electronic elements necessary to fulfil the desired function (which is not relevant for the invention in question). The switching element 5 is connected with the

switch 16 (no permanent connection). I. e. if the pushbutton 6 is pressed the switch 16 is activated. The pushbutton 6 is held resiliently in an axial end position by means of a coil spring 15, i. e. the pushbutton 6 is pressed against the force of the coil spring 15.

[0020] The carrier element 12 also bears a pair of concentric sleeves 10 and 11, more specifically an inner stationary sleeve 10 and an outer rotatable sleeve 11. Both sleeves form a part of an encoder.

[0021] Provision is made that the disc 3 and the adjustment element 2 respectively are torque proof connected with the outer sleeve 11, so that a rotation of the disc 3 actuates the adjustment of an operation parameter. Also, provision is made that the pushbutton 6 and the switching element 5 respectively can be moved axially in the direction of the axis 4 but remains stationary with respect to the angular position.

[0022] For this the inner sleeve 10 has a plurality of groove-like receptions 8 (see FIG 2) and the switching element 5 has the same number of protrusions 9. The receptions 8 and the protrusions 9 are formed congruently so that the protrusions 9 extend fittingly into the receptions 8. The receptions 8 as well as the protrusions 9 extend in axial direction of the axis 4. Consequently, the switching element 5 can be moved in axial direction without the possibility that a rotational movement occurs between the switching element 5 and the sleeve 10. As the sleeve 10 is stationary a rotational movement of the pushbutton 6 is prevented. In general, the receptions 8 and the protrusions 9 form means for preventing a rotational movement between the parts.

[0023] On the other hand, also the outer sleeve 11 has a plurality of groove-like receptions and the adjusting element 2 has the same number of protrusions, which are formed congruently. The receptions as well as the protrusions extend also here in axial direction of the axis 4. Consequently, a torque-proof connection exists between the adjustment element 2 and the sleeve 11.

[0024] The invention proposal guarantees that a good guidance of the pushbutton 6 and the switching element 5 respectively is established. The pushbutton 6 is secured against a rotational movement. Also standard parts can be used for the suggested switching element.

[0025] On the switch panel 14 not only the switch 16 is arranged but also other relevant and necessary parts of the unit, especially the encoder formed by the sleeves 10 and 11 and other controller elements.

[0026] Preferably snap-on connections can be used where parts have to be connected. The arrangement can be covered by a glass panel 17. As the pushbutton 6 does not rotate it is easily possible to place an inscription on it which remains legible under all circumstances.

Reference Numerals

[0027]

1 Switching element

2 Adjustment element
3 Disc
4 Axis of rotation
5 Switching element
6 Pushbutton
7 Reception
8, 9 Means for preventing a rotational movement
8 Groove-like reception
9 Protrusion
10 Inner sleeve (stationary)
11 Outer sleeve (rotatable)
12 Carrier element
13 Connection means
14 Switch panel (sheet metal carrier element)
15 Spring element
16 Switch
17 Glass panel

20 Claims

1. Switching element (1) for an appliance, especially for a domestic appliance, having in combination an adjustment element (2) for adjusting an operation parameter of the appliance by rotating a disc (3) around an axis (4) of rotation and a switching element (5) for switching an operation parameter of the appliance by pressing a pushbutton (6) in the direction of the axis (4) of rotation,
25 **characterized in that**
the pushbutton (6) has a circular perimeter, wherein the pushbutton (6) is arranged in a corresponding circular concentric reception (7) in the adjustment element (2) and wherein means (8, 9) are provided for preventing a rotational movement of the pushbutton (6) relatively to the switching element (1) around the axis (4) of rotation.
2. Switching element according to claim 1, **characterized in that** it has two concentric sleeves (10, 11), wherein one sleeve (10) is stationary and fixed to a carrier element (12) of the switching element (1) and one sleeve (11) is rotatable and fixed with the disk (3).
3. Switching element according to claim 2, **characterized in that** the means for preventing a rotational movement of the pushbutton (6) are at least one groove-like reception (8) in the stationary sleeve (10) and at least one protrusion (9) at the switching element (5) which extends into the groove-like reception (8).
4. Switching element according to claim 2, **characterized in that** the means for preventing a rotational movement of the pushbutton (6) are at least one protrusion at the stationary sleeve (10) and at least one groove-like reception in the switching element (5),

wherein the protrusion extends into the groove-like reception.

5. Switching element according to claim 3 or 4, **characterized in that** a plurality of groove-like receptions (8) and protrusions (9) are arranged around the circumference of the parts (6, 10). 5
6. Switching element according to at least one of claims 3 till 5, **characterized in that** the at least one groove-like reception (8) and the at least one protrusion (9) extends along the axis (4) of rotation at or in the parts (6, 10). 10
7. Switching element according to at least one of claims 2 till 6, **characterized in that** the adjustment element (2) is connected to the rotatable sleeve (11) by means of at least one protrusion and at least one groove-like reception in which the at least one protrusion extends. 15
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8. Switching element according to at least one of claims 2 till 7, **characterized in that** the two concentric sleeves (10, 11) are parts of an encoder. 25
9. Switching element according to at least one of claims 2 till 8, **characterized in that** the carrier element (12) is connected by connection means (13) to a switch panel (14) of the appliance. 30
10. Switching element according to at least one of claims 1 till 9, **characterized in that** the disk (3) is connected with the adjustment element (3) by means of a snap-on connection. 35
11. Switching element according to at least one of claims 1 till 10, **characterized in that** the pushbutton (6) is connected with the switching element (5) by means of a snap-on connection. 40
12. Switching element according to at least one of claims 1 till 11, **characterized in that** the pushbutton (6) is held resiliently in an axial end position by means of a spring element (15). 45
13. Switching element according to claim 12, **characterized in that** the spring element (15) is a coil spring.
14. Switching element according to at least one of claims 1 till 13, **characterized in that** the switching element (5) is connected with a switch (16) at the axial end being remote from the pushbutton (6). 50
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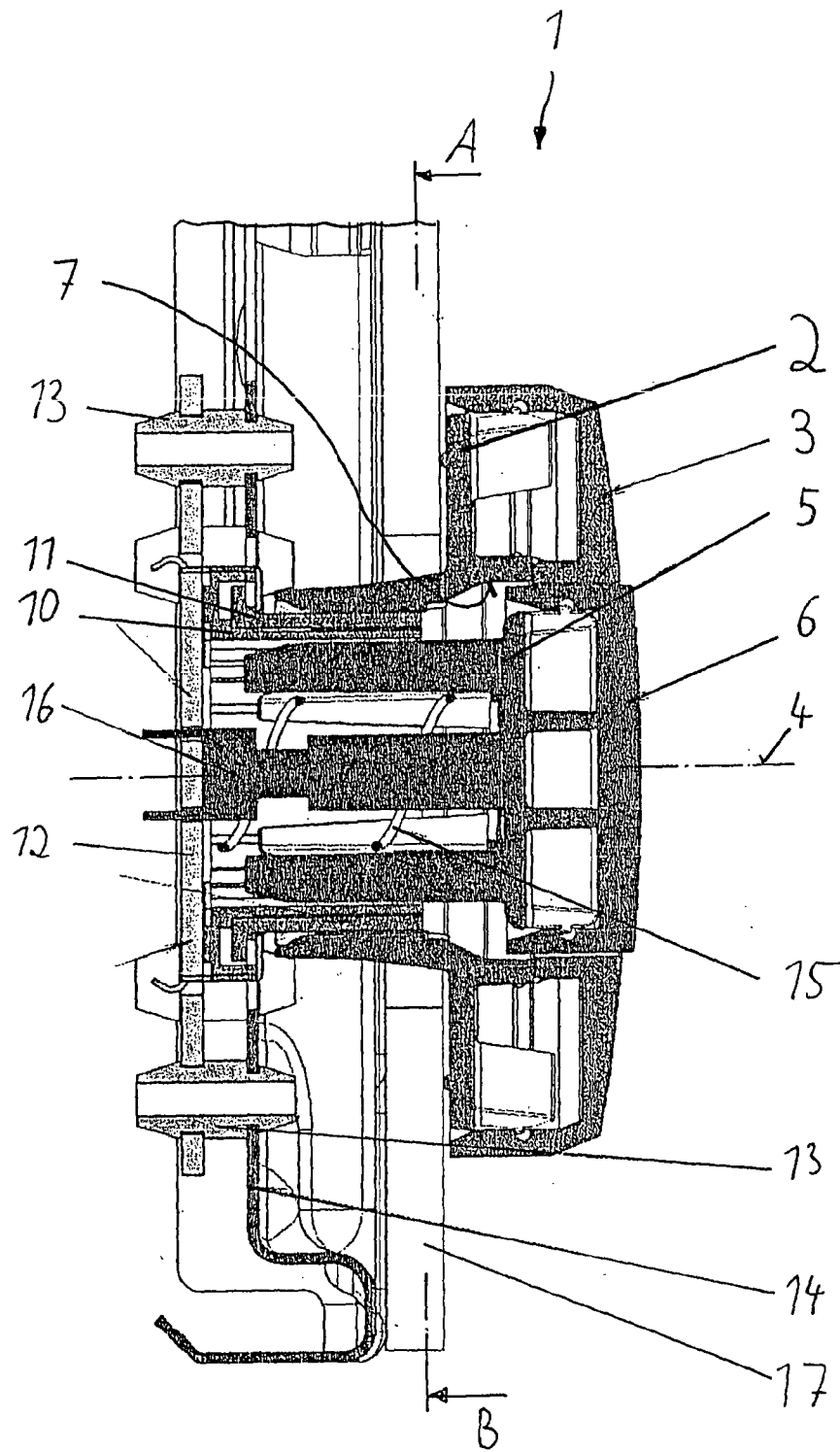


Fig. 1

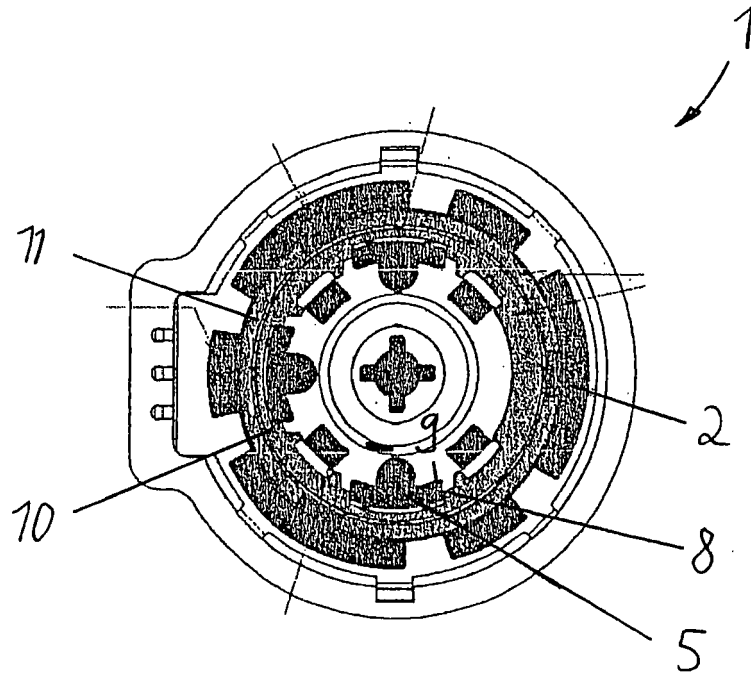


Fig. 2



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 01 0436

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			H01H G05G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 October 2007	Examiner Ruppert, Christopher
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 01 0436

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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10-10-2007

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