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(54) **Rotary selector**

(57) The present invention relates a rotary selector arranged to be positioned in a carrier having slots defining predetermined positions of the rotary selector, the rotary selector comprising at least one spring element arranged to snap into locking engagement with one of the slots of the carrier to hold the rotary selector in one of the pre-defined position.

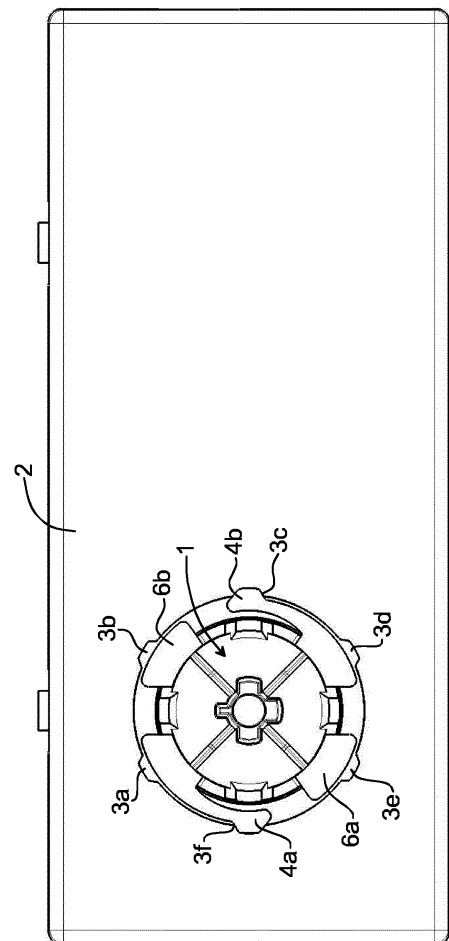


Fig. 1

Description

TECHNICAL FIELD

[0001] The invention relates to a rotary selector and a household appliance arranged with the rotary selector.

BACKGROUND

[0002] In the art, when providing for example a household appliance, such as a dish washer, a washing machine, a coffee machine, a flat iron, etc., with a rotary selector for enabling a user to select a particular programme of the appliance, such as a predefined washing programme or degree of grinding of coffee beans, the rotary selector and necessary peripheral equipment such as a potentiometer for translating the selected position of the rotary selector to an electric signal to be communicated to a microprocessor controlling the household appliance, the rotary selector is typically directly mounted to a printed circuit board of the appliance, on which e.g. the microprocessor, required storage area and the potentiometer is mounted. The rotary selector comprises, among other things, a centrally located and axially arranged spindle protruding from the printed circuit board and through the chassis of the appliance. On the external side of chassis, the spindle is terminated by a knob, thus forming part of the control panel of the appliance.

[0003] A problem in the art is that printed circuit board mounting requires a particular type of rotary selector which generally is expensive.

SUMMARY

[0004] An object of the present invention is to solve or at least mitigate this problem in the art.

[0005] This object is achieved in an aspect of the present invention by a rotary selector arranged to be positioned in a carrier having slots defining predetermined positions of the rotary selector, the rotary selector comprising at least one spring element arranged to snap into locking engagement with one of the slots of the carrier to hold the rotary selector in one of the predefined position.

[0006] Thus, the rotary selector is arranged to be positioned in a carrier with slots defining predetermined positions in which the rotary selector can be selectively arranged. The rotary selector comprises one or more spring elements for snapping into locking engagement with the slots to set, and retain, the rotary selector in one of the predefined positions. For instance, the rotary selector may be used in a household appliance where the carrier is embodied by removing a portion of the chassis to form a circular socket where the rotary selector can be housed. In the circumference of the socket, the slots are cut to form the predefined positions in which the rotary selector selectively will be set. It should be noted that the present invention is not limited to be used in household appliance

es; practically any device employing a rotary selector could make use of the present invention.

[0007] When operating the rotary selector, the spring elements of the selector will snap into locking engagement with the slots, thereby holding the selector in one of the predefined positions. Advantageously, a cost-effective and easy-to-construct rotary selector is provided.

[0008] In an embodiment of the present invention, the spring element is arranged to apply a radial force to the slot of the carrier upon engagement with the slot. This will advantageously facilitate snap-in and retention of the rotary selector in its selected position.

[0009] In another embodiment of the present invention, the spring element is arranged to be adapted to the slot such that it creates a geometrical locking with the slot in the rotational direction(s) of the selector upon engagement. However, in this particular embodiment, the spring element does not necessarily apply a radial force to the slot. Thus, the spring element does not necessarily abut the section of the slot which is furthest radially distal from a centre of the rotary selector.

[0010] It should be noted that a combination of the two preceding embodiments is possible by combining the geometrical locking with spring elements applying a radial force to the slot. This will advantageously even further improve retention of the rotary selector in a selected position.

[0011] In a further embodiment of the present invention, the rotary selector comprises two radially opposed spring elements, each of the spring elements being arranged to snap into locking engagement with a respective carrier slot. Advantageously, the rotary selector will be able to rotate smoothly when two equally great forces act radially on two opposing slots of the carrier.

[0012] In yet another embodiment of the present invention, the rotary selector further comprises a spindle arranged along the rotational axis of the rotary selector, said spindle being arranged to engage with a rotary potentiometer that will produce a different output signal for each predetermined position of the rotary selector in order for e.g. a microprocessor, in the appliance in which the rotary selector is implemented, to determine the set position of the selector. Thus, only the rotary potentiometer will be mounted to the printed circuit board of the appliance, whereas the rotary selector is fastened to the appliance chassis and fitted in relation to the potentiometer such that it is located at a suitable distance from the rotary potentiometer in order for the spindle to appropriately engage with the potentiometer.

[0013] In still another embodiment of the present invention, the rotary selector further comprises radially protruding supporting elements arranged to abut the carrier for axially fixing the rotary selector upon positioning of the rotary selector in the carrier. Thus, the radially protruding supporting elements will advantageously act as supporting means bracing against the carrier to prevent the rotary selector from being pushed into the socket in which selector is positioned.

[0014] In another embodiment of the present invention, the rotary selector further comprises axially protruding supporting elements arranged to abut the carrier for radially fixing the rotary selector upon positioning of the rotary selector in the carrier. Thus, the axially protruding supporting elements will advantageously act as supporting walls bracing against the circumference of the socket to attain a tight fit between the rotary selector and the carrier.

[0015] In an embodiment of the present invention, the spring elements are radially protruding and arranged to be radially resilient to snap into locking engagement with a respective carrier slot.

[0016] In an alternative embodiment, the spring elements are implemented in the form of axially extending elongated ribs forming an angle with a base of the rotary selector of 90 degrees or more, typically just above 90 degrees, which ribs are arranged to be radially resilient to snap into locking engagement with a respective carrier slot. In a further embodiment of the invention, to increase the radial force applied by a rib on a slot, or to make the ribs more rigid to increase their ability to attain geometrical locking, a wedge element is arranged between the base of the rotary selector and the rib.

[0017] It is noted that the invention relates to all possible combinations of features recited in the claims. Further features of, and advantages with, the present invention will become apparent when studying the appended claims and the following description. Those skilled in the art realize that different features of the present invention can be combined to create embodiments other than those described in the following.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The invention is now described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a rotary selector according to an embodiment of the present invention, which selector is housed in a carrier;

Fig. 2 shows a side view of the rotary selector of Fig. 1, without being positioned in a carrier;

Fig. 3 shows a rotary selector according to a further embodiment of the present invention, which selector is housed in a carrier; and

Fig. 4 shows the carrier of Fig. 1, without a rotary selector positioned in it.

DETAILED DESCRIPTION

[0019] The invention will now be described more fully hereinafter with reference to the accompanying drawings, in which certain embodiments of the invention are

shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

[0020] Figure 1 shows a rotary selector according to an embodiment of the present invention. The rotary selector 1 is housed in a carrier 2. In practice, the rotary selector 1 may be used in a household appliance where the carrier 2 is accomplished during production of the household appliance by forming, e.g. by means of cutting, a circular socket in the chassis of the household appliance where the rotary selector can be housed. In the circumference of the socket, slots 3a-f are cut to form the predefined positions in which the rotary selector selectively will be set, where each position defines a predefined programme of the household appliance. For instance, if the household appliance is a washing machine, a first position may indicate "white wash 60°", a second position indicates "half load", a third position indicates "quick wash", etc. The rotary selector and these indications printed on the chassis in connection to the rotary selector thus form the control panel of the appliance.

[0021] The particular rotary selector 1 shown in Figure 1 comprises two spring elements 4a, 4b arranged to snap into locking engagement with two respective slots. In this particular view, the spring elements snap into locking engagement with slots 3c and 3f, when the rotary selector is rotated in the carrier 2, thereby retaining the rotary selector in the selected position.

[0022] The spring elements 4a, 4b of the rotary selector 1 may be retained in the respective slot 3f and 3b by having the spring elements apply a radial force to the slots, thus creating the locking engagement. In such a case, the spring elements 4a, 4b are resilient in a radial direction. Alternatively, the spring elements 4a, 4b are arranged to be fitted into the slots such that they create a geometrical locking with the slots 3c, 3f in the rotational direction(s) of the rotary selector 1 upon engagement, in which case the spring elements not necessarily apply a radial force to the slots but are fitted with the slots such that they are retained in locking engagement until a sufficient, operator-applied rotary force acts on the selector with an objective to select a different programme (or turn the appliance off). A combination of these two alternatives can be envisaged.

[0023] With further reference to Figure 1 and Figure 2, which shows only the rotary selector in a side view, the rotary selector 1 according to an embodiment of the invention comprises radially protruding supporting elements 6a, 6b arranged to abut the carrier 2 for axially fixing the rotary selector upon positioning of the rotary selector in the carrier. Thus, the radially protruding supporting elements 6a, 6b will advantageously act as supporting means bracing against the carrier to prevent an operator from pushing the rotary selector 1 into the socket

in which selector is positioned.

[0024] Figure 2 also shows a further embodiment of the present invention, where the rotary selector 1 further comprises axially protruding supporting elements 7a, 7b arranged to abut the carrier (not shown in Figure 2) for radially fixing the rotary selector upon positioning of the rotary selector in the carrier to avoid play from arising between the rotary selector and the carrier. Thus, the axially protruding supporting elements 7a, 7b will advantageously act as supporting walls bracing against the circumference of the socket to attain a tight fit between the rotary selector and the carrier.

[0025] With reference again to Figure 2, another embodiment of the present invention is illustrated, in which the rotary selector 1 further comprises a spindle 5 arranged along the rotational axis of the rotary selector. The spindle 5 is arranged to engage with a rotary potentiometer (not shown) mounted to a printed circuit board of the household appliance such that rotation of the rotary selector to the predetermined positions defined by the slots will cause the rotary potentiometer to produce a different output signal for each predetermined position of the rotary selector, in order for e.g. a microprocessor to determine the set position of the selector and select a corresponding appliance programme accordingly.

[0026] Figure 3 shows a slightly different rotary selector 1 from that shown in Figures 1 and 2, which rotary selector again is housed in a carrier 2 (of e.g. a washing machine), where the spring elements are implemented in the form of axially extending elongated ribs 4a', 4b' forming an angle α with a base 8 of the rotary selector of 90 degrees or more, typically just above 90 degrees, which ribs are arranged to be radially resilient to snap into locking engagement with a respective carrier slot 3a, 3b. As further shown in Figure 3, a wedge element 9 is arranged between the base 8 of the rotary selector 1 and the rib 4a' to increase the radial force applied by a rib on a slot, or to make the ribs more rigid to increase their ability to attain geometrical locking.

[0027] Figure 4 shows a carrier 2 where a socket 10 has been cut to house a rotary selector. Slots 3a-f are created at the perimeter of the socket 10 such that the rotary selector can be retained in one of the positions defined by the slots.

[0028] Even though the invention has been described with reference to specific exemplifying embodiments thereof, many different alterations, modifications and the like will become apparent for those skilled in the art. The described embodiments are therefore not intended to limit the scope of the invention, as defined by the appended claims.

Claims

1. Rotary selector (1) arranged to be positioned in a carrier having slots (3a-f) defining predetermined positions of the rotary selector, the rotary selector com-

prising at least one spring element (4a, 4b) arranged to snap into locking engagement with one of the slots of the carrier to hold the rotary selector in one of the predefined positions.

2. The rotary selector (1) of claim 1, wherein the at least one spring element (4a, 4b) is arranged to be adapted to the slots such that it attains a geometrical locking with a slot in a rotational direction of the rotary selector upon snapping into locking engagement with the slot.
3. The rotary selector (1) of any one of claims 1 or 2, wherein the at least one spring element (4a, 4b) is arranged to apply a radial force to a slot (3a-f) of the carrier (2) upon snapping into locking engagement with the slot.
4. The rotary selector (1) of any one of claims 1-3 comprising two radially opposed spring elements (4a, 4b), each of the spring elements being arranged to snap into locking engagement with a respective carrier slot (3a-f).
5. The rotary selector (1) of any one of the preceding claims, further comprising a spindle (5) arranged along the rotational axis of the rotary selector, said spindle being arranged to engage with a rotary potentiometer that will produce a different output signal for each predetermined position of the rotary selector.
6. The rotary selector (1) of any one of the preceding claims, further comprising radially protruding supporting elements (6a, 6b) arranged to abut the carrier (2) for axially fixing the rotary selector upon positioning of the rotary selector in the carrier.
7. The rotary selector (1) of any one of the preceding claims, further comprising axially protruding supporting elements (7a, 7b) arranged to abut the carrier (2) for radially fixing the rotary selector upon positioning of the rotary selector in the carrier.
8. The rotary selector (1) of any one of the preceding claims, wherein the spring elements are radially protruding spring elements (4a, 4b) arranged to be radially resilient to snap into locking engagement with a respective carrier slot (3a-f).
9. The rotary selector (1) of any one of claims 1-7, wherein the spring elements comprise axially extending elongated ribs (4a', 4b') forming an angle (α) with a base (8) of the rotary selector of 90 degrees or more, which ribs are arranged to be radially resilient to engage with a respective carrier slot (3a, 3b).
10. The rotary selector (1) of claim 8, further comprising

a wedge element (9) arranged between the base of the rotary selector and a respective elongated rib (4a', 4b') to increase the radial force applied by said respective rib to a slot (3a, 3b).

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11. A household appliance being arranged with the rotary selector (1) of any one of the preceding claims.

12. The household appliance of claim 11, wherein the carrier (2) in which the rotary selector (1) is to be positioned is the chassis of the appliance where a socket (10) has been created to house the rotary selector.

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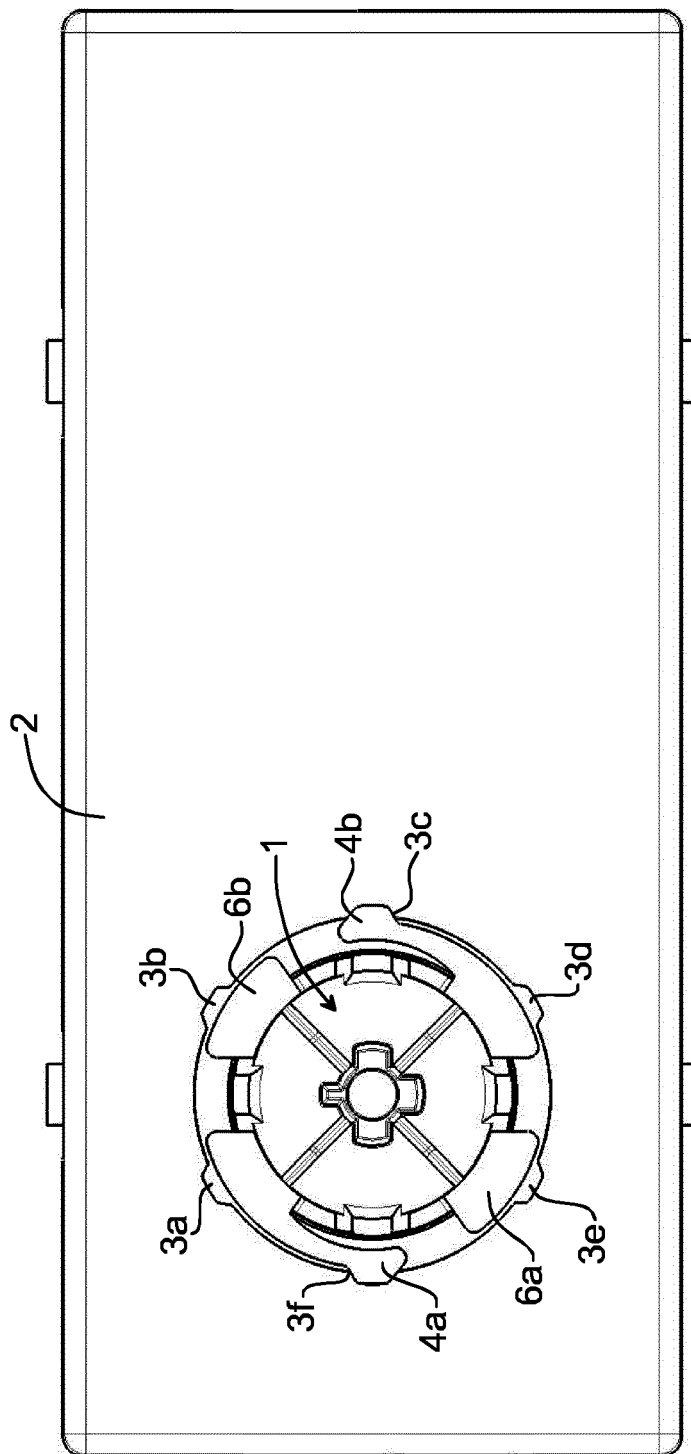


Fig. 1

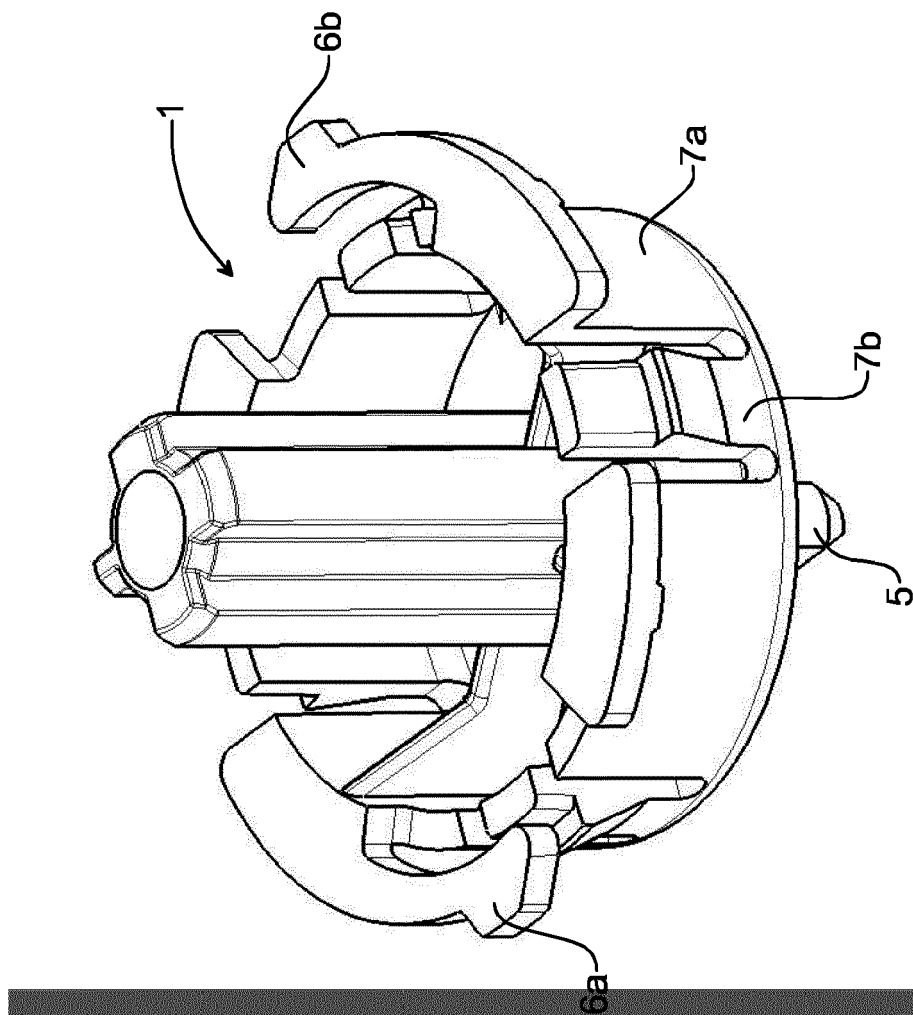


Fig. 2

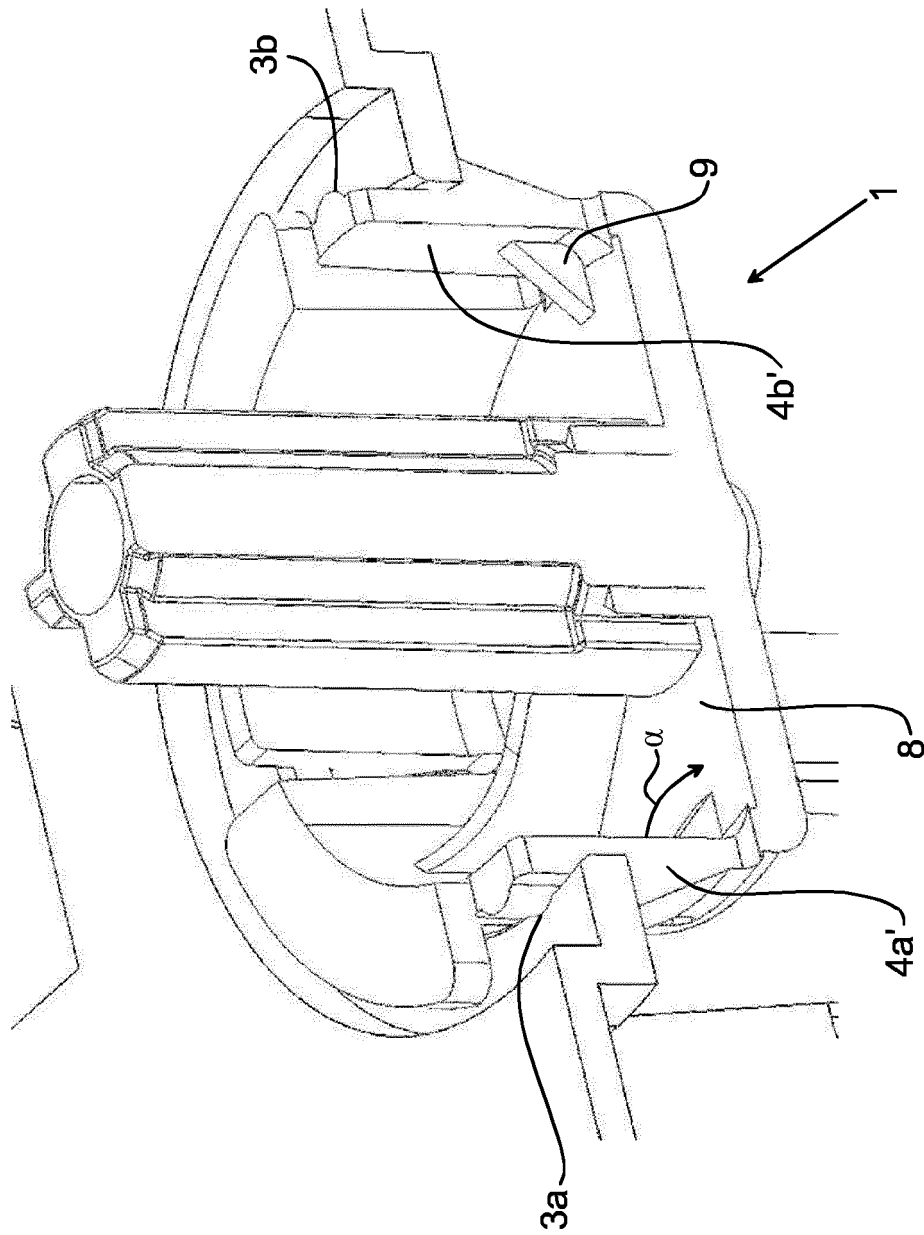


Fig. 3

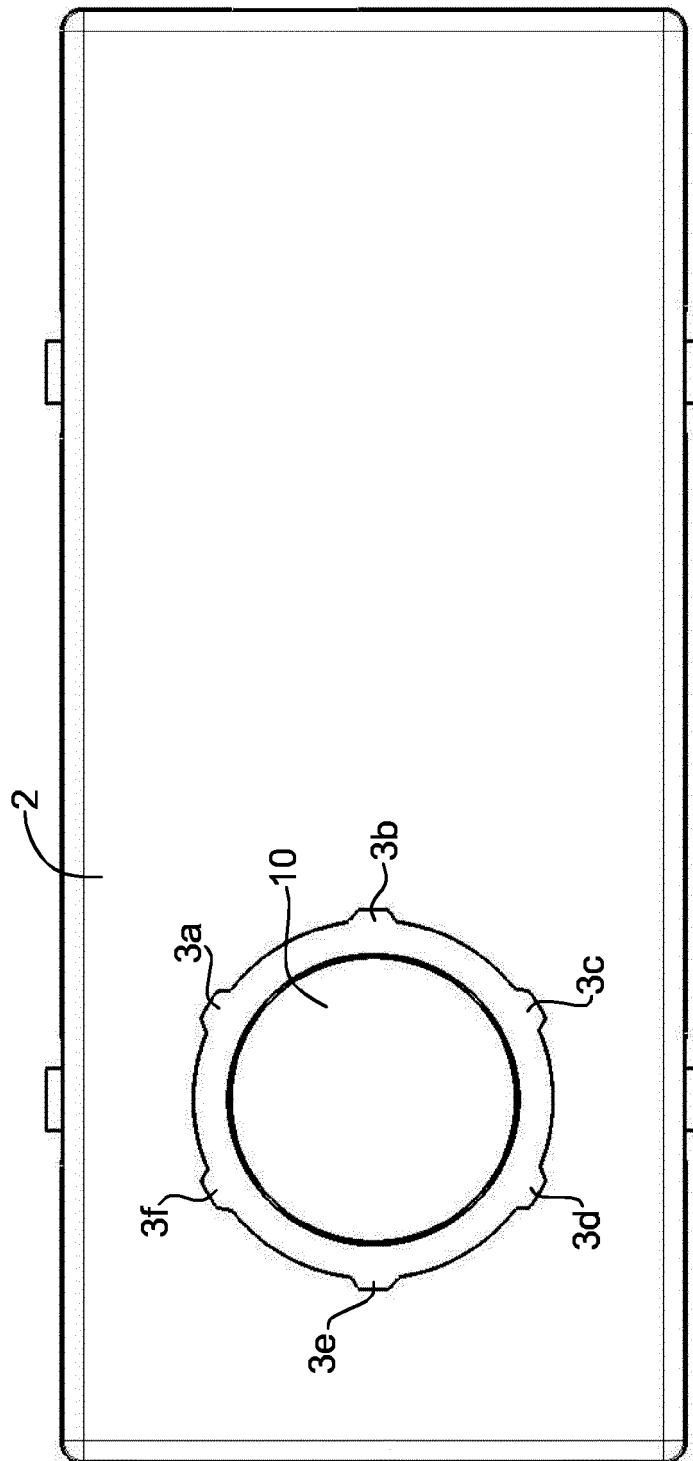


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 4022

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Place of search The Hague		Date of completion of the search 7 August 2012	Examiner D'Sylva, Christophe
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
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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