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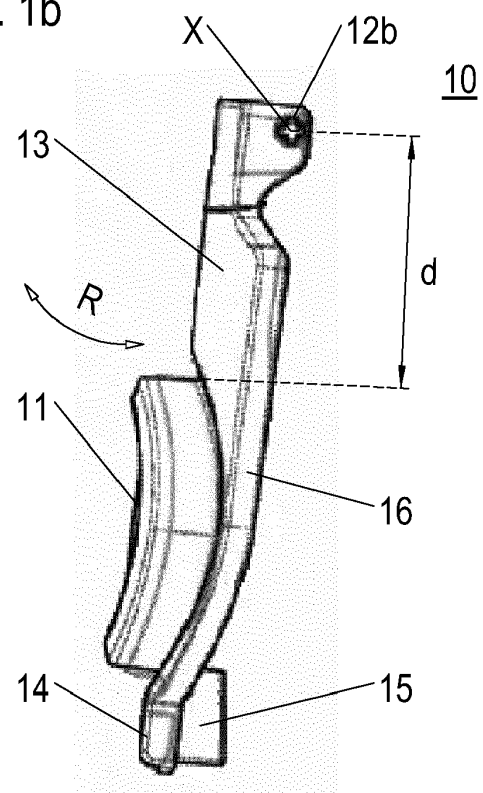
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(54) **SWITCH ELEMENT, HOUSEHOLD APPLIANCE UNIT WITH SWITCH ELEMENT, AND HOUSEHOLD APPLIANCE**

(57) Disclosed is a switch element 10 for a household appliance. The switch element comprises an actuator button 11 designated to be pressed by a user to control one or more electronic and/or electric part/s 21, 23 of the household appliance. The switch element 10 further comprises at least one mounting element 12a, 12b configured to pivotably attach the switch element to a holding portion 31a, 31b of the household appliance. Therein, a designated pivot axis X is spaced apart from the actuator button 11.

Further disclosed is a household appliance unit 100 comprising a switch element 10, and a household appliance comprising such household appliance unit 100 as a component.

Fig. 1b



Description

[0001] The present invention concerns a switch element for a household appliance. The invention further concerns a household appliance unit with such a switch element. Moreover, the invention concerns a household appliance comprising, as a first component, such a household appliance unit.

[0002] Switch elements enabling a user to control electric and/or electronic parts of a household appliance are conventionally designed as rotatable control buttons configured to be rotated about a centre axis thereof, or as press buttons configured to be moved in linear direction.

[0003] It is an object of the present invention to provide an alternative technique facilitating control of household appliances.

[0004] The object is achieved by a switch element according to claim 1, by a household appliance unit according to claim 6 and by a household appliance according to claim 10. Advantageous embodiments are disclosed in the dependent claims, the description and the figures.

[0005] A switch element according to the present invention is devised for a household appliance, to control one or more electronic and/or electric parts thereof (with respect to at least an aspect). As a particular example, the switch element may be configured as an on/off - switch and/or as a switch for selecting an operation mode of the electronic and/or electric part/s. The household appliance may be a kitchen appliance, such as an electric blender, a hand blender or a food processor, for instance.

[0006] The switch element comprises an actuator button designated to be pressed by a user to control the one or more electronic and/or electric part/s of the household appliance. The switch element further comprises at least one mounting element configured to pivotably attach the switch element to a holding portion (in particular, to a respective seat) of the household appliance, in particular of a housing or support frame thereof. A pivot axis (determined by the at least one mounting element) is spaced apart from the actuator button, i.e., it is located at a positive distance (>0) to the actuator button. In particular, $d \geq 1\text{cm}$, $d \geq 2\text{cm}$ or even $d \geq 3\text{cm}$ may preferably hold.

[0007] Advantageously, a centre of the actuator button (in particular, a centre of a designated touch surface of the actuator button) has a distance D to the pivot axis, wherein $D \geq 2\text{cm}$, $D \geq 4\text{cm}$ or even $D \geq 6\text{cm}$. Additionally or alternatively, $d \geq 0.3D$ or even $d \geq 0.5D$ may hold.

[0008] The switch element thus is designed as a pendulum-like swing element. Thereby, a user friendly, simple and comfortable manipulation by a user is facilitated, and a household appliance comprising the switch element may be constructed particularly robust and safe. Moreover, the switch element can be mounted in tight interspaces in the interior of a respective housing of the household appliance.

[0009] A household appliance unit according to the present invention may be an entire household appliance or may be at least a component of a household appliance

(such as - for example - a motor base thereof, including an electric motor), which may be configured to be combined with at least one further component so as to form a household appliance.

[0010] The household appliance unit comprises one or more electronic and/or electric part/s, a housing at least partially enclosing the electronic and/or electric part/s, and a switch element according to an embodiment of the present invention. The switch element is configured to control the one or more electronic and/or electric part/s (with respect to at least an aspect) upon actuation of the switch element. By means of its at least one mounting element, the switch element is pivotably attached to a holding portion of the household appliance unit, in particular of the housing or of a support frame possibly further comprised by the household appliance unit. Therein, the switch element at least partially closes an opening in the housing.

[0011] The switch element thus is configured to facilitate control of the electronic and/or electric part/s. As is to be understood, further means may be comprised, by the household appliance unit, for controlling the electronic and/or electric part/s. As a particular example, the switch element may serve as an on/off switch and/or as a switch for selecting an operation mode of the electronic and/or electric part/s.

[0012] Due to the present invention, the household appliance unit may be constructed particularly compact and robust, and it may allow a particularly convenient and simple manipulation.

[0013] Preferably, the housing of a household appliance unit according to the present invention comprises one or more leading elements such as protruding ribs, which may be configured to support the switch element in its pivoting movement. Thereby, a particularly reliable operation of the switch element is ensured.

[0014] According to advantageous embodiments, the household appliance unit further comprises at least one elastic element whose restoring force acts on the switch element. Such elastic element may comprise a torsion spring which may be arranged at the at least one mounting element. Additionally or alternatively, said elastic element/s may comprise an element whose restoring force acts in linear direction.

[0015] In a designated orientation of utilisation of the household appliance unit, the switch element is preferably attached with its at least one mounting element (in particular, with its - preferably horizontal - pivot axis) positioned above or below the actuator button. Therewith, a particularly solid fastening by means of the at least one mounting element can be achieved.

[0016] A household appliance unit according to the present invention may comprise (or even be) a unit of a kitchen appliance. As particular examples, a household appliance unit according to the present invention may comprise (or even be) a motor base of an electric blender, of a hand blender or of a food processor.

[0017] A household appliance according to the present

invention comprises a household appliance unit according to the present invention. In addition, it comprises at least one further component configured to be detachably coupled to the household appliance unit. The further component may comprise a tool to be driven by means of the electric and/or electronic part/s of the household appliance unit. In particular, the at least one further component may comprise a jar component (configured to receive food to be processed), and/or a hand blender shaft comprising a rotatable tool, for example.

[0018] According to preferred embodiments of the present invention, the at least one mounting element of the switch element comprises at least one pivot pin configured to be inserted into a lug comprised by the holding portion of the household appliance unit. Additionally or alternatively, the at least one mounting element may comprise at least one lug configured to receive a pin the holding portion of the household appliance unit may comprise.

[0019] Thereby, a simple and solid mounting of the switch element is facilitated.

[0020] Advantageously, the switch element comprises a base portion from which the actuator button protrudes, preferably in a designated possible direction of pivoting (i.e., with an appropriate sign). In a household appliance unit comprising such switch element, the base portion may be arranged within an interior space enclosed by the housing. The base portion may thus be at least partially covered by the housing. Thereby, the household appliance unit can be constructed with a robust and compact shape facilitating easy cleaning. In at least one or all attainable pivoting position/s of the switch element, the actuator button may at least partially project through the opening of the housing. Thereby, an advantageous haptic control can be provided to a user.

[0021] For instance, the actuator button may be shaped cylindrically with centre axis orthogonal to the designated pivot axis of the switch element.

[0022] According to an advantageous embodiment, a pivoting position of the switch element (relative to the housing) is attainable in which a surface of the housing smoothly transitions to a surface of the actuator button. Thereby, cleaning of the household appliance unit is particularly easy.

[0023] In embodiments of the present invention, in which the switch element - as mentioned above - comprises a base portion from which the actuator button protrudes, the base portion may preferably at least partially surround the actuator button, thus forming a flange about the actuator button. Therewith, the base portion can serve to catch and guide a liquid flow, thereby improving security of the household appliance (unit) and protecting the electric and/or electronic part/s thereof against being impaired by dirt, dust and/or wetting. According to advantageous embodiments, the base portion from which the actuator button may protrude comprises at least one stopper member located at a side of the actuator button opposite to the at least one mounting element. Such stop-

per member may be configured to strike against the housing in at least one pivot position of the switch element, when the switch element is mounted. Thereby, it may delimit a possible pivot angle of the switch element.

[0024] In the following, preferred embodiments of the present invention are explained with respect to the accompanying drawings. As is to be understood, the various elements and components are depicted as examples only, may be facultative and/or combined in a manner different than that illustrated. Reference signs for related elements are used comprehensively and not defined again for each figure.

[0025] Shown is schematically in

15 Fig. 1a: a switch element according to an exemplary embodiment of the present invention in a front view (viewing direction orthogonally to the designated pivot axis);

20 Fig. 1b: the switch element of Figure 1a in a side view (viewing direction parallel to the designated pivot axis);

25 Fig. 2a: a household appliance unit according to an exemplary embodiment of the present invention in partial cross section and with viewing direction orthogonally to the designated pivot axis of the switch element;

30 Fig. 2b: the household appliance unit of Figure 2a, with the switch element being in a first pivoting position, in partial cross section and with viewing direction parallel to the designated pivot axis of the switch element and along with a detail view;

35 Fig. 2c: the household appliance unit of Figures 2a, 2b with the switch element being in a second pivoting position;

40 Fig. 2d: the household appliance unit of Figures 2a - 2c together with a possible liquid flow.

[0026] Figures 1a, 1b show an exemplary embodiment of a switch element 10 according to the present invention. It is configured to form part of a household appliance (unit), in particular of a kitchen appliance (unit), and to serve for manipulating one or more electronic and/or electric part/s thereof.

50 **[0027]** The switch element 10 comprises an actuator button 11 devised to be pressed, in a designated press direction, by a user so as to manipulate the one or more electronic and/or electric part/s of the household appliance (unit).

55 **[0028]** The switch element 10 further comprises two mounting elements 12a, 12b which in the embodiment depicted both are pivot pins extending, at opposite sides of the switch element 10, orthogonally to the designated

press direction. The mounting elements 12a, 12b (i.e., the pins) are configured to pivotably attach the switch element 10 to a housing of the household appliance, as illustrated in Figure 2a: therein, the pivot pins both have been mounted in a respective holding portion of the household appliance unit, which holding portions 31a, 31b in the embodiment depicted comprise respective lugs.

[0029] As indicated in Figure 1a, the mounting elements 12a, 12b together define a designated pivot axis X, about which the switch element - when it is mounted - is pivotable. The viewing direction in Figure 1a is orthogonal to the pivot axis X. By contrast, Figure 1b shows the switch element 10 with viewing direction parallel to the pivot axis X.

[0030] In the example depicted, the actuator button 11 is shaped cylindrically with centre axis orthogonal to the designated pivot axis X. For a distance D of a centre (thus, the centre axis) of the actuator button 11 to the pivot axis X preferably $D \geq 2\text{cm}$, $D \geq 4\text{cm}$ or even $D \geq 6\text{cm}$ holds.

[0031] The pivot axis X is located at a positive distance $d > 0$ to the actuator button 11, i.e., is spaced apart therefrom. The switch element 10 thus is configured as a pendulum-like swing part. Preferably, $d \geq 1\text{cm}$, $d \geq 2\text{cm}$ or even $d \geq 3\text{cm}$ holds true. With respect to the distance D of the centre of the actuator button 11 to the pivot axis X, $d \geq 0.3D$ or even $d \geq 0.5D$ may preferably hold.

[0032] As seen in Figure 1b, the actuator button 11 protrudes, in a designated direction R of pivoting (with an appropriate sign), from a base portion 13 of the switch element 10. The base portion 13 surrounds the actuator button 11, thereby forming a (recessed) flange 16 around it.

[0033] The base portion 13 of the switch element 10 depicted in Figures 1a, 1b as an exemplary embodiment of the present invention further comprises a stopper member 14 which is located at a side of the actuator button 11 opposite to the mounting elements 12a, 12b. The stopper member 14 is configured to strike against the housing in at least one pivot position of the switch element 10 (when it is mounted in a respective holding portion), thereby delimiting the pivoting in one direction.

[0034] By means of the flange 16, intrusion of dirt and/or dust into a housing of the household appliance may be inhibited, and liquid may be kept away from the one or more electric and/or electronic part/s of the household appliance (as further detailed below with regard to Figure 2d). To advantageously guide such liquid flow, the flange 16 and/or the stopper member 14 may preferably comprise at least a projecting rib, so as to form a leading groove. Thereby, in particular, the stopper member 14 may form a spout.

[0035] As is further illustrated in Figure 1b, the base portion 13 further comprises an actuation transfer element 15 which, when the switch element 10 is mounted in a holding portion, faces at least one electric and/or electronic part thereof. In the embodiment shown in Fig-

ure 1b, the actuation transfer element 15 is located at a side of the actuator button 11 opposite to the at least one mounting element 12a, 12b. It is configured to operate the electric and/or electronic part/s when the actuator button is pressed. Thereby, the household appliance unit may be switched on and/or off, and/or a respective operation mode of the household appliance unit may be changed.

[0036] Figures 2a - 2d depict respective details of a household appliance unit 100 according to the present invention. The household appliance unit 100 comprises a housing 30 and a switch element 10 according to the present invention, whose pivot pins 12a, 12b both have been mounted in respective holding portions 31a, 31b (comprising respective lugs) of the housing 30.

[0037] As is best seen in the representation provided by Figure 2b, in the exemplary embodiment shown, the household appliance unit 100 is a motor base of a kitchen machine, in particular of an electric blender. Indeed, the household appliance unit 100 is configured to be combined to a jug (not shown), so as to drive a tool thereof by means of an electric motor 21 and a coupling 22 comprised by the household appliance unit 100. As an electronic part 23, a control system is operable by means of the switch element 10 and serves for controlling the electric motor 21.

[0038] As further seen in Figure 2b, the switch element 10 is mounted such that the base portion 13 is positioned (preferably completely) in an interior space enclosed by the housing 30. The base portion 13 is thus covered by the housing 30, whereas the actuator button 11 at least partially protrudes through an opening O of the housing 30.

[0039] A detail view provided in Figure 2b shows (in a different cross section) how the mounting element (pivot pin) 12b is held in the half-open lug (comprised by holding portion 31b) by means of a fixation element 33b closing the opening of the half-open lug, thus enabling only rotation of the mounting element 12b. Mounting element 12a is preferably mounted and fixed analogously (not visible) in a corresponding lug comprised by holding portion 31a.

[0040] Indeed, in a process of mounting the switch element 10, the mounting elements 12a, 12b may first be inserted each into a respective half open lug, and then the respective openings of the lugs may be closed by means of a common fixation element or by means of dedicated respective fixation elements.

[0041] Leading elements 32a, 32b, 32c, 32d formed as ribs protruding from the housing 30 in an interior space thereof serve to ensure that the pivotable switch element 10 is safely held in its designated path (i.e., during its rotation) and thus, to provide for high operational reliability. Therein, first leading elements 32a, 32b are configured to guide the stopper member 14 of the switch element, as depicted on Figure 2a. Second leading elements 32c, 32d, visible in Figure 2b, guide the rotating switch element 10 between its actuator button 11 and

the pivot axis X (determined by the mounting elements 12a, 12b).

[0042] In the situation shown in Figure 2b, the switch element 10 is in a first position, in which the actuator button 11 partly projects from an outer surface of the housing 30 and in which the stopper member 14 strikes against an inner surface of the housing 30 (i.e., against a surface facing the interior space enclosed by the housing 30). In this position, the actuator button 11 may be pressed in a direction orthogonal to the pivot axis X, as indicated by a respective arrow, possibly against an elastic force of at least one elastic element (not shown) which may be comprised by the household appliance unit 100.

[0043] In Figure 2c, a situation is shown (in another cross section) where the switch element 10 is in a second position, namely, pressed such that the actuation transfer element 15 acts on the electronic part 23 so as to control the electric motor 21.

[0044] In this second position, a surface of the housing 30 smoothly transitions to a surface of the actuator button 10. Moreover, the stopper member 14 is spaced away from the (inner surface of the) housing 30, and the switch element 10 is ready for pivoting back into the first position, as indicated by an arrow. In particular, the elastic force of an elastic element (not shown) may urge the switch element 10 towards said first position.

[0045] Figure 2d illustrates how the electronic part 23 is protected against liquid (in particular, water) intruding into the interior of the housing 30.

[0046] Indeed, as indicated by respective arrows, a liquid L flowing down the housing 30 and entering an interspace between the actuator button 11 and the housing 30 is guided along the flange 16 and the stopper member 14 and out of the housing 30. Thereby, it is inhibited that the liquid L advances to the electronic part 23. Thus, the safety of the household appliance unit 100 is increased.

[0047] Disclosed is a switch element 10 for a household appliance. The switch element comprises an actuator button 11 designated to be pressed by a user to control one or more electronic and/or electric part/s 21, 23 of the household appliance. The switch element 10 further comprises at least one mounting element 12a, 12b configured to pivotably attach the switch element to a holding portion 31a, 31b of the household appliance. Therein, a designated pivot axis X is spaced apart from the actuator button 11.

[0048] The switch element facilitates a robust and safe construction of a household appliance unit 100, wherein an advantageous utilisation of a tight interspace between the housing and the electric and/or electronic part/s 21, 23 is achieved.

[0049] Further disclosed is a household appliance unit 100 comprising a switch element 10, and a household appliance comprising such household appliance unit 100 as a component.

Reference signs

[0050]

5	10	switch element
	11	actuator button
	12a, 12b	mounting element
	13	base portion
	14	stopper member
10	15	actuation transfer element
	16	flange
	21	electric motor
	22	coupling
15	23	electronic part (control system)
	30	housing
	31a, 31b	holding portion
	32a, 32b	first leading elements
20	32c, 32d	second leading elements (ribs)
	33	fixation element
	d	distance of the actuator button 30 from the pivot axis X
25	D	distance of a centre of the actuator button to the pivot axis X
	L	liquid flow
	P	passage
	O	opening in housing 30
30	R	pivot direction
	X	pivot axis

Claims

- 35 1. Switch element (10) for a household appliance, wherein the switch element comprises an actuator button (11) designated to be pressed by a user to control one or more electronic and/or electric part/s of the household appliance, and at least one mounting element (12a, 12b) configured to pivotably attach the switch element to a holding portion (31a, 31b) comprised by the household appliance, with a pivot axis (X) being spaced apart from the actuator button (11).
- 40 2. Switch element according to claim 1, wherein the at least one mounting element (12a, 12b) comprises
 - 45 - at least one pivot pin configured to be inserted into a lug comprised by the holding portion (31a, 31b) and/or
 - at least one lug configured to receive a pin comprised by the holding portion.
- 50 3. Switch element according to one of claims 1 or 2, wherein the actuator button (11) protrudes from a base portion (13) of the switch element.
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4. Switch element according to claim 3, wherein the base portion (13) at least partially surrounds the actuator button (11), thus forming a flange about the actuator button (11). 5
5. Switch element according to one of claims 3 or 4, wherein the base portion (13) further comprises at least one stopper member (14) located at a side of the actuator button (11) opposite to the at least one mounting element (12a, 12b). 10
6. Household appliance unit (100) comprising one or more electronic and/or electric part/s (21, 23), a housing at least partially enclosing (30) the electronic and/or electric part/s and having an opening (O), and a switch element (10) according to one of the preceding claims, 15
wherein the switch element (10) is pivotably attached, by means of its at least one mounting element (12a, 12b), to a holding portion (31a, 31b) of the household appliance unit, thereby at least partially closing the opening (O), and configured to control the one or more electronic and/or electric part/s (21, 23) upon actuation of the switch element (10). 20
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7. Household appliance unit according to claim 6, wherein the switch element (10) is in accordance with one of claims 3, 4 or 5, and wherein the base portion (13) is at least partially arranged within an interior space enclosed by the housing (30). 30
8. Household appliance unit according to one of claims 6 or 7, wherein in at least one or all attainable pivoting position/s of the switch element (10), the actuator button (11) at least partially projects through the opening (O) of the housing (30). 35
9. Household appliance unit according to one of claims 6 to 8, wherein the household appliance unit is a motor base of a household appliance, the motor base comprising an electric motor (21). 40
10. Household appliance comprising a household appliance unit (100) according to one of claims 6 to 9, and at least one further component configured to be detachably coupled to the household appliance unit. 45

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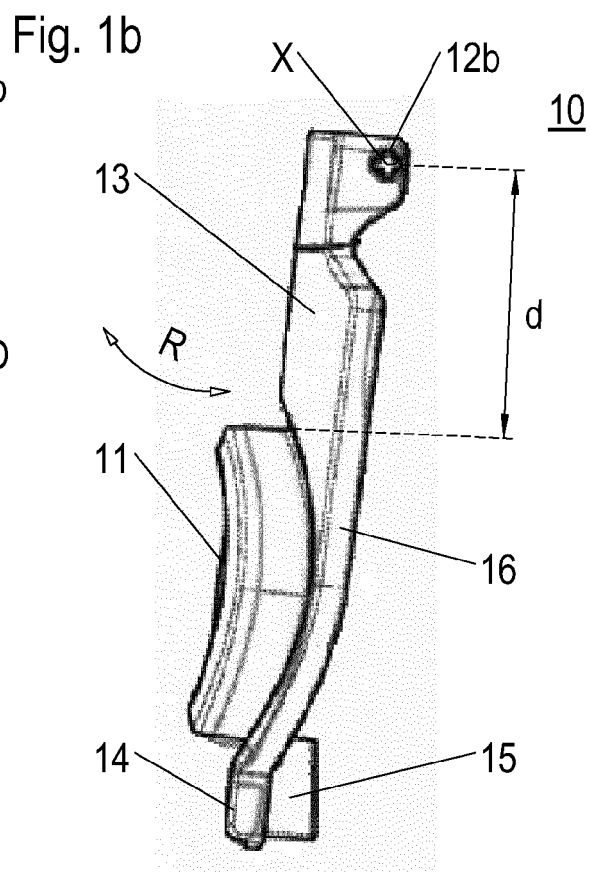
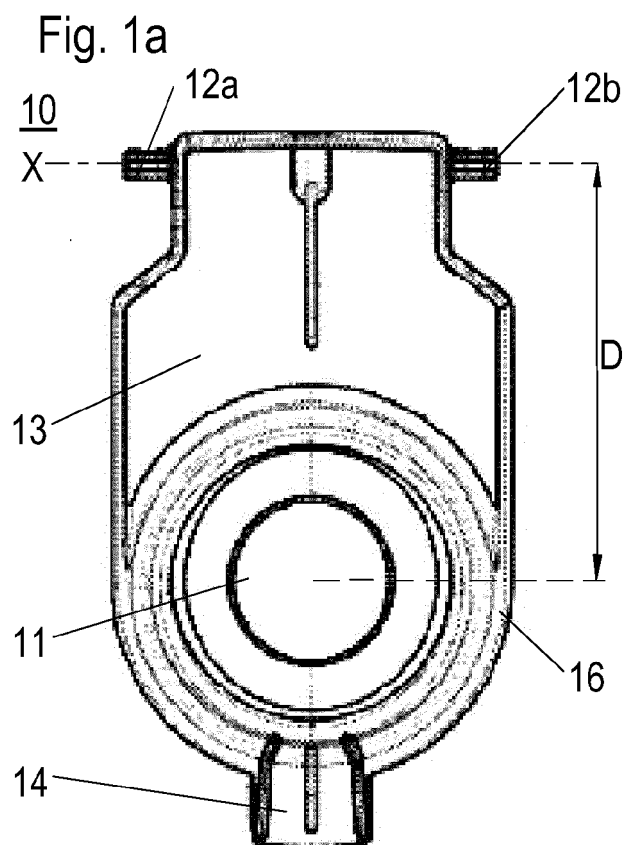


Fig. 2a

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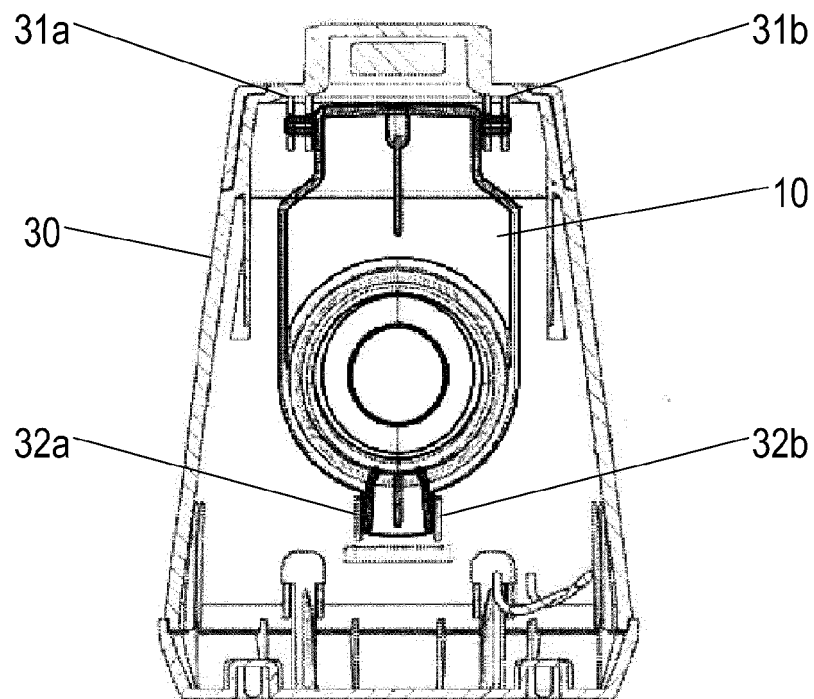


Fig. 2b

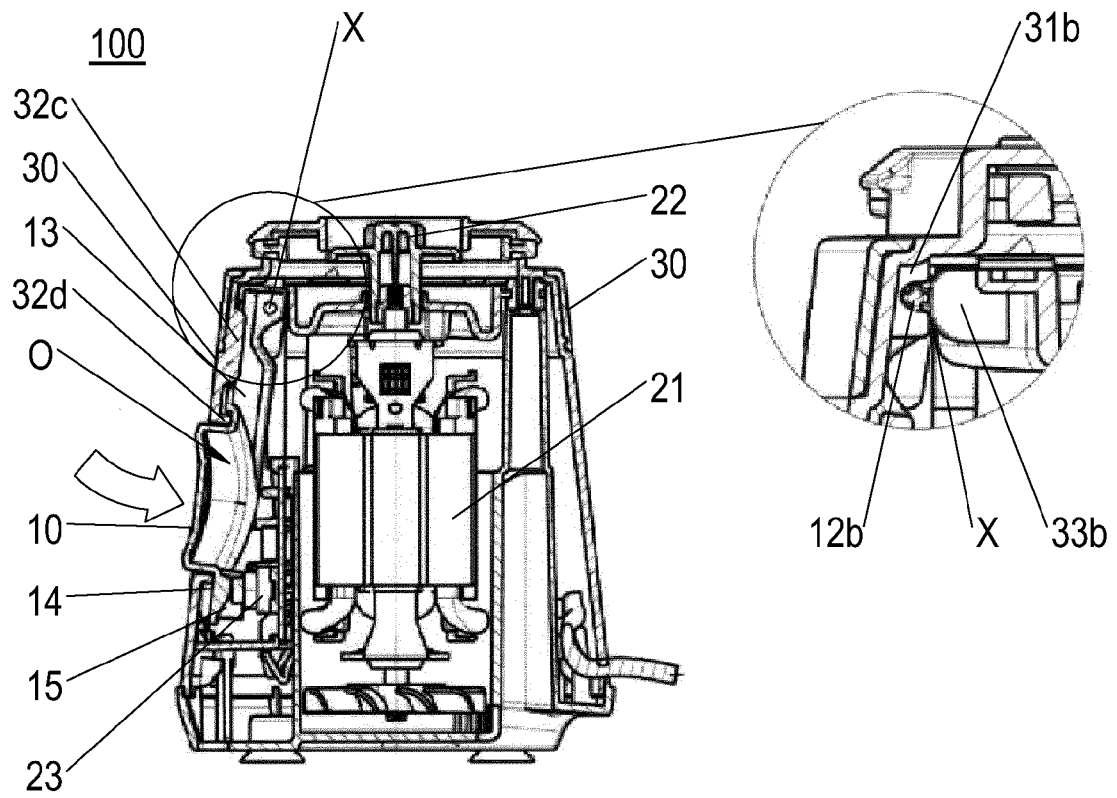


Fig. 2c

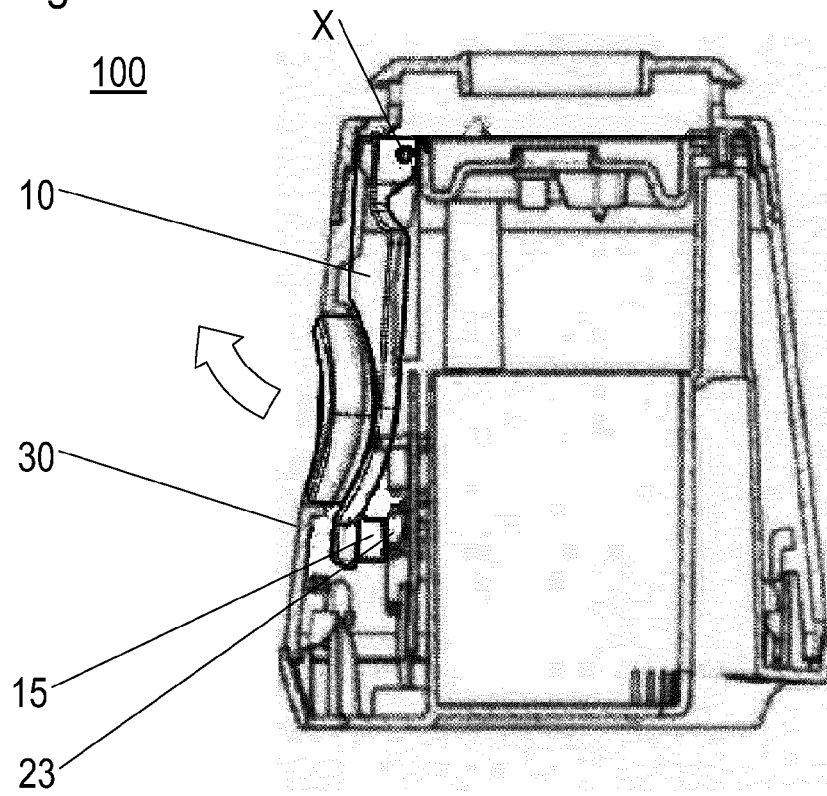
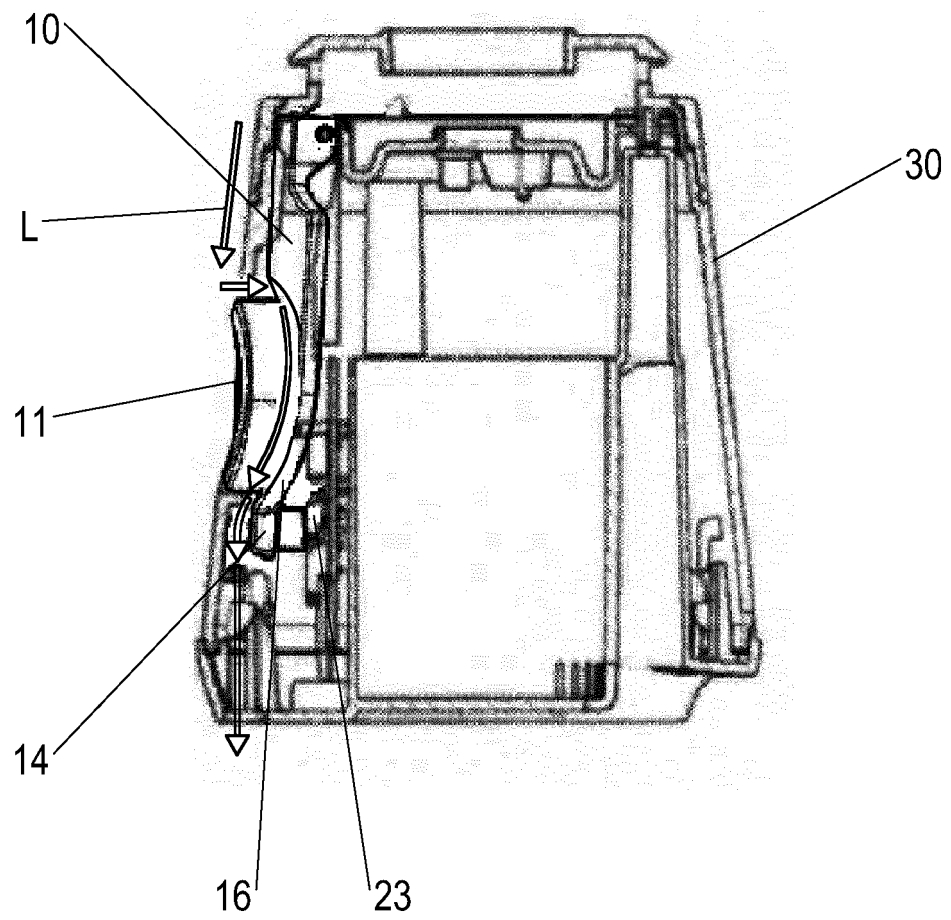


Fig. 2d

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EUROPEAN SEARCH REPORT

Application Number
EP 20 21 1175

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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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 20 21 1175

5 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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