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(54) **A ROTARY CONTROL KNOB OF A GAS COOKER**

(57) The invention is a gas cooker (1) having a cooker body (10) with a front panel (11) to which a control knob (20) is mounted and a gas tap with a flow control member controlled by a gas tap shaft rotated by said control knob (20), **characterized in that** said control knob (20) comprises a knob body (30) connected to the gas tap shaft and a body housing (50) configured to at least partly re-

ceive said knob body (30) in a freely rotating manner and to be fixedly mounted to said front panel (11), said body housing (50) having a resilient member (53) and said knob body (30) having ribs (34) each of which gets into contact with said resilient member (53) respectively at certain intervals during the rotation of the knob body (30).

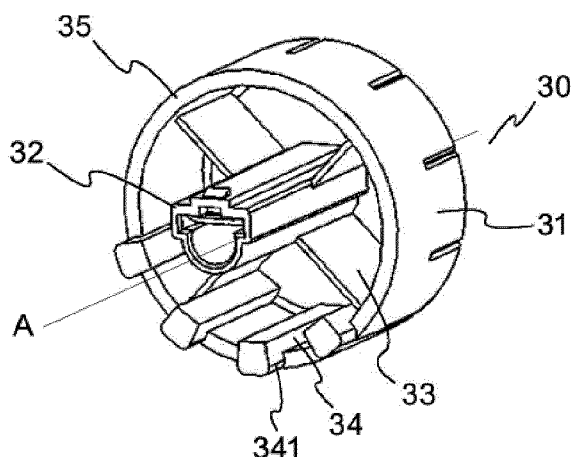


Figure 2c

Description

TECHNICAL FIELD

[0001] The present invention relates to a gas cooker with control knobs and particularly to a gas cooker having a cooker body with a front panel to which a control knob is mounted, a gas tap having a flow control member controlled by a gas tap shaft which is rotated by said control knob.

PRIOR ART

[0002] In gas cookers, each rotary control knob interacts with a gas tap inside the gas cooker. In detail, each gas tap includes a flow control member rotated by its respective gas tap shaft. Accordingly, each control knob is connected to one gas tap shaft in a shape coupling manner so that gas flow is adjusted when user rotates the control knob.

[0003] US5906141 describes a device which permits locking of a control knob which can rotate around a cylindrical support and includes a lateral face with at least one first locking boss and a lateral face of a bracelet which has at least one second locking boss. The ring is movable in translation according to the axis between a locked position of the knob, in which the ring is prevented from rotating around the axis when the first and second bosses are engaged, and between a released position in which the first and second bosses are decoupled.

[0004] EP1388872 describes an operating mechanism for rotational switch avoiding unintentional actuation. Accordingly, a variable output device mounted on a mounting unit with the operating shaft displaceable.

[0005] TR2013/15150 describes a cooking appliance including a tactile feedback device, of which at least a portion is accommodated within a tap body of the gas tap, and which includes a follower configured to extend radially from the tap body towards a flow control element in order to provide sensory adjustment of gas adjustment levels by rotation of the button.

BRIEF DESCRIPTION OF THE INVENTION

[0006] A purpose of the invention is to allow users to feel certain gas adjustment levels when using a control knob of a gas cooker.

Another purpose of the invention is to allow users to adjust burner flames with respect to certain flame levels even though visual signs provided around the control knobs for indicating such levels mostly or completely faded out.

[0007] In order to realize above mentioned objects and those which are to be deducted from the detailed description below, the present invention is a gas cooker having a cooker body with a front panel to which a control knob is mounted and a gas tap with a flow control member controlled by a gas tap shaft rotated by said control knob.

It is characterized in that said control knob comprises a knob body connected to the gas tap shaft and a body housing configured to at least partly receive said knob body in a freely rotating manner and to be fixedly mounted to said front panel, said body housing having a resilient member and said knob body having ribs each of which gets into contact with said resilient member respectively at certain intervals during the rotation of the knob body.

[0008] In a probable embodiment of the present invention, the body housing comprises a tail section extending axially through an A axis from a mounting opening of the front panel towards inside of the gas cooker and configured to allow snap fit mounting to the front panel. Thus, the body housing can easily be mounted to the front panel without using bolt or screws by simply pushing it towards the gas cooker.

[0009] In another probable embodiment of the present invention, said tail section comprises resilient walls extending inwardly along said A axis and erected in peripherally spaced manner with respect to each other. Related to this, at least one of said resilient walls has a tab on its outer face. Thus, the resilient wall bends during mounting allowing the tab thereon to pass through the front panel and then to abut other side of the front panel to complete snap fit connection.

[0010] In another probable embodiment of the present invention, the body housing further comprises plurality of fixing tongues configured to be inserted through corresponding slots formed on the front panel. Thus, the body housing is prevented from rotating with respect to the front panel.

[0011] In another probable embodiment of the present invention, the body housing comprises a seat portion defined by a side wall which extends along the whole periphery of the body housing so that it at least partly receives the knob body in a freely rotating manner. Thus, knob body can be rotated with respect to the body housing.

[0012] In another probable embodiment of the present invention, the resilient member is fixed to the periphery of the seat portion in a manner that it projects radially and inwardly from the periphery. Related to this, the resilient member is made of an elastically deformable metallic material. On the other hand, the knob body has a hollow cylindrical-like geometry and plurality of ribs are provided in a peripherally spaced manner along its annular face. Thus, it becomes possible that the ribs get into contact respectively with the resilient member to produce tactile effect to the user as he/she rotates the knob body.

[0013] In another probable embodiment of the present invention, each rib extends parallel to the A axis and has a distal end partly projecting from the annular face. Thus, each rib contact to the resilient member via their respective distal end to produce tactile feeling for the user.

[0014] In another probable embodiment of the present invention, a protection cap, made of a metallic material, is placed as covering the distal end of each rib so that it

resides between the resilient member and its respective rib during contact. Thus, the ribs, made of a softer material, are not worn by the elastic member, made of a relatively harder material, in time.

[0015] In another probable embodiment of the present invention, said protection caps are part of a protection bracelet placed to the knob body and having a flat cross section. Thus, it is possible to easily attach protection caps to the knob body without using any coupling elements such as bolt or screws.

[0016] In another probable embodiment of the present invention, said protection bracelet comprises a bracelet section extending along the inner face of the knob body's side wall in a manner of resting onto said inner face. Thus, easy removal of the protection bracelet from the knob body is prevented.

BRIEF DESCRIPTION OF FIGURES

[0017]

Figure 1 illustrates a gas cooker equipped with the present invention.

Figure 2a illustrates a perspective view of the inventive control knob.

Figure 2b illustrates a perspective view of the body housing of the inventive control knob.

Figure 2c illustrates a perspective view of the button body of the inventive control knob.

Figure 3a illustrates a perspective view of the protection bracelet used in the control knob.

Figure 3b illustrates a rear view of the button body with the protection bracelet thereon.

Figure 3c illustrates a perspective view of the button body with the protection bracelet thereon.

Figure 4a illustrates a section view of the control knob.

Figure 4b illustrates another section view of the control knob.

Figure 5a illustrates a front view of the front panel with the control knob thereon.

Figure 5b illustrates a rear view of the front panel with the control knob thereon.

DETAILED DESCRIPTION OF THE INVENTION

[0018] Preferred embodiments of the present invention will now be more particularly described by way of exam-

ple with reference to the accompanying drawings.

[0019] Figure 1 illustrates a gas cooker (1) having a cooker body (10) and a front panel (11) to which plurality of control knobs (20) embodying the present invention is mounted. The gas cooker (1) also comprises gas taps each having a flow control member rotated by its respective gas tap shaft (not shown in figures). Accordingly, each control knob (20) is connected to one gas tap shaft in a shape coupling manner so that gas flow is adjusted when user rotates the control knob (20). In alternative embodiments, the control knobs of the present invention, however, might be applied to any other electric or gas fired device.

[0020] Referring to figure 2a, the control knob (20) has a cylindrical-like geometry and mainly comprises a knob body (30) connected to the gas tap shaft of one gas tap of the gas cooker in a shape coupling manner and a body housing (50) to which said knob body (30) is partly seated in a freely rotating manner and which is mounted to the gas cooker (1) via a mounting opening formed on the front panel. Referring to figure 2c, a shaft sleeve (32), to which gas tap shaft is inserted in a shape coupling manner, is shown. The shaft sleeve (32) axially extends along an A axis from the center of the base towards inside the gas cooker (1). Plurality of radial support walls (33) are also provided radially extending from the shaft sleeve (32) towards the inner face of the knob body's side wall (31). Additionally, as it will be explained in detail below, the knob body (30) rotates with respect to the body housing (50) in a manner that user can percept predefined gas adjustment levels at certain rotation angels of the knob body (30). On the other hand, both the knob body (30) and the body housing (50) are made of a plastic material.

[0021] In the rear face (57) of the body housing (50) facing towards the gas cooker (1), a hub section (55) is provided which fixedly attaches the body housing (50) to the front panel (10). For this purpose, said hub section (55) incorporates a tail section (551) extending axially through said A axis from the mounting opening towards inside of the gas cooker (1). The tail section (551) comprises resilient walls (552) extending along the A axis - inwardly and formed in a peripherally spaced manner with respect to each other. Accordingly, resilient walls (552) are separated from each other by cut-outs (553) formed therebetween. Each resilient wall (552) is in an arc form and thus all resilient walls (552) define an annular cross section sized to allow tight connection with the mounting opening. Related to this, each resilient wall (552) includes a tab (554) on its outer face.

[0022] Thanks to this embodiment, body housing (50) is easily mounted to the front panel (11) in a snap fit manner. In detail, when the body housing (50) is aligned with the mounting opening and pushed towards inside of the gas cooker (1), tabs (554) get into contact with the front panel (11) and thus each resilient walls (552) bends thanks to the cut-outs (553) opened therebetween. Referring to figure 5b, when the tabs (554) pass through the

mounting opening mounting is completed and removal of the body housing (50) from the mounting opening is prevented by the tabs (554) abutting on the inner face of the front panel (11). In a possible embodiment, 4 equivalent resilient walls (552) each having one tab (554) thereon are used for forming the tail section (551).

[0023] Rear side of the body housing also comprises plurality of fixing tongues (56) extending axially through the A axis and formed as peripherally spaced in the vicinity of hub section's periphery. As shown in figure 5b, each fixing tongue (56) also passes through its corresponding slot (111) formed on the front panel (11) during mounting of the body housing (50). Thus, the fixing tongues (56) prevent rotation of the body housing (50) with respect to the front panel. In a possible embodiment, 3 fixing tongues (56) are provided which are equally spaced from each other so as to define corners of a virtual equilateral triangle.

[0024] Referring to figure 2b, the body housing (50) comprises a seat portion (52) which receives the knob body (30) and is defined by a side wall (51) which extends along the whole periphery of the body housing (50). The height of the side wall (51) and thus the depth of the seat portion (52) are configured to partly receive the knob body (30).

[0025] The body housing (50) and the knob body (30) are configured to give tactile effect so that a user can percept certain gas adjustment levels while using the control knob (20) of the invention. Accordingly, the knob body (30) includes ribs (34) each indicating one gas adjustment level and correspondingly the body housing (50) includes a resilient member (53) which gets into contact with the ribs (34) respectively as user rotates the knob body (30). Details will hereunder be explained.

[0026] Referring to figures 2a and 2b, the resilient member (53) is fixed to the periphery of the seat portion (52). The resilient member (53) projects radially and inwardly from the periphery and made of an elastically deformable metallic material. In detail, the resilient member (53) comprises a projecting section (531) in a V-like form and a holding section (532) defined by two wings each of which extends from one open end of the V form along the part of the seat portion's periphery. The resilient member (53) is secured to the body housing (50) during plastic injection molding process and thus the body housing (50) is removed from its mold as already including the resilient member at the end of the injection process. In a preferred embodiment, said resilient member (53) is made of a metallic material and preferably obtained by forming a metal strip.

[0027] Referring to figure 2c, the knob body (30) has a hollow cylindrical-like geometry. Along the periphery of its side wall (31), plurality of ribs (34) are provided in a peripherally spaced manner and each of them extends along the side wall (31) parallel to the A axis and partly projects outwardly. In detail, the ribs (34) preferably extend from the base of the knob body (30) and ends up with a distal end (341) partly projecting from the annular

face (35) of the knob body (30). On the other hand, each rib (34) has a thickness so as to radially project from the side wall (31). In a preferred embodiment, the ribs (34) are in column-like form. Numbers of the ribs and spaces therebetween define gas adjustment levels to be felt by the user. In a preferred embodiment, there are provided 4 ribs (34) equally spaced from each other. Additionally, all the ribs (34) are monolithic part of the knob body (30) and thus obtained by using appropriate molds during the plastic injection process.

[0028] In figure 3a, a protection bracelet (40) is shown which is preferably obtained by forming a metallic strip. Said protection bracelet (40) comprises a bracelet section (42) and plurality of protection caps (41) formed along the bracelet section (42) in a peripherally spaced manner. The protection caps (41) are, however, narrower than the bracelet section (42) due to cut-outs made in bottom part thereof during forming process. In a preferred embodiment, 4 protection caps (41) are formed in a manner that each protection cap (41) corresponds to one rib (34). As shown in figure 3b, the protection bracelet (40) is placed to the knob body (30) in a manner that each protection cap (41) encircles a corresponding distal end (341) of one rib (34) while bracelet section (42) extends along the inner face of the knob body's side wall (31). Thanks to this embodiment, the protection bracelet (40) ensures that distal ends (341), which are made of plastic, are not worn by the resilient member (53) made of metal when both features get into contact during rotation of the control knob (20).

[0029] On the other hand, since the bracelet section (42) is wider than the protection caps (41), the bracelet section (42) resting onto the inner face of the side wall (31) provides a retaining function preventing removal of the protection bracelet (40) from the knob body (30). Related to this, as shown in figure 3c, bracelet section (42) seats onto one end of each radial support walls (33).

[0030] In figure 4a, position of the resilient member (53) in respect of ribs is shown. Accordingly, when user rotates the knob body (30), body housing (50) fixed to the front panel (11) remains its position. Thus, the ribs (34) respectively advances towards the resilient member (53) as the user keep rotating the knob body (30) and after certain degree of rotation the first rib gets into contact with the resilient member (53) via its respective protection cap (41) thereon, giving tactile feeling to the user as regards an associated gas adjustment level. If user's increases his/her force to rotate a certain extent, the resilient member (53) deforms allowing the first rib to pass the resilient member (53). If for example, user wishes to increase the flame he/she keeps rotating the knob body (30) and accordingly after a certain rotation degree, the next rib gets into contact with the resilient member the user again feels the next gas adjustment level. Thanks to this inventive embodiment, user can feel all gas adjustment levels when using the control knob (20) embodying the invention. Thanks to this tactile feeling effect, for example, flame levels of burners can easily be perceived

and thus adjusted accordingly even though visual indicators around each control knob cannot be seen or faded out in time. This feature also allows blind people to use gas cookers easily and safely.

[0031] Referring to figure 4b, a pressing spring (36) is also provided inside the shaft sleeve (32) in a manner that said pressing spring (36) exerts a force to the gas tap shaft. Thank to this, if the knob body (30) is pulled outwardly the frictional force between the pressing spring (36) and the gas tap shaft prevents easy removal of the knob body (30).

[0032] Figure 5a shows frontal view of the control knob (20) of the invention. Accordingly, protection caps (41) each covering a corresponding rib (34) and the resilient member (53) interacting with all the ribs (34) via protection caps (41) can be seen from this figure.

[0033] It will be readily apparent that modifications of the embodiments hereinbefore described are possible. In particular, although numerous features are shown in combination, these features can also be taken into consideration individually and also combined into any feasible further combinations.

REFERENCE NUMERALS

1 Gas cooker	50 Body housing
10 Cooker body	51 Side wall
11 Front panel	52 Seat portion
111 Slot	53 Resilient member
20 Control knob	531 Projecting section
30 Knob body	532 Holding section
31 Side wall	54 Shaft opening
32 Shaft sleeve	55 Hub section
33 Radial supporting walls	551 Tail section
34 Rib	552 Resilient wall
341 Distal end	553 Cut-out
35 Annular face	554 Tab
36 Pressing spring	56 Fixing tongue
40 Protection bracelet	57 Rear face
41 Protection cap	A: Extension axis
42 Bracelet section	

Claims

1. A gas cooker (1) having a cooker body (10) with a front panel (11) to which a control knob (20) is mounted and a gas tap with a flow control member controlled by a gas tap shaft rotated by said control knob (20), **characterized in that** said control knob (20) comprises a knob body (30) connected to the gas tap shaft and a body housing (50) configured to at least partly receive said knob body (30) in a freely rotating manner and to be fixedly mounted to said front panel (11), said body housing (50) having a resilient member (53) and said knob body (30) having ribs (34) each of which gets into contact with said

resilient member (53) respectively at certain intervals during the rotation of the knob body (30).

2. A gas cooker according to claim 1, wherein the body housing (50) comprises a tail section (551) extending axially through an A axis from a mounting opening of the front panel (11) towards inside of the gas cooker (1) and configured to allow snap fit mounting to the front panel (11).
3. A gas cooker according to claim 2, wherein said tail section (551) comprises resilient walls (552) extending inwardly along said A axis and erected in peripherally spaced manner with respect to each other.
4. A gas cooker according to claim 3, wherein at least one of said resilient walls (552) has a tab (554) on its outer face.
5. A gas cooker according to any of the preceding claims, wherein the body housing (50) further comprises plurality of fixing tongues (56) configured to be inserted through corresponding slots (111) formed on the front panel (11).
6. A gas cooker according to any of the preceding claims, wherein the body housing (50) comprises a seat portion (52) defined by a side wall (51) which extends along the whole periphery of the body housing (50) so that it at least partly receives the knob body (30) in a freely rotating manner.
7. A gas cooker according to claim 6, wherein the resilient member (53) is fixed to the periphery of the seat portion (52) in a manner that it (53) projects radially and inwardly from the periphery.
8. A gas cooker according to claim 1 or 7, wherein the resilient member (53) is made of an elastically deformable metallic material.
9. A gas cooker according to claim 1, wherein the knob body (30) has a hollow cylindrical-like geometry and plurality of ribs (34) are provided in a peripherally spaced manner along its annular face (35).
10. A gas cooker according to claim 9, wherein each rib (34) extends parallel to the A axis and has a distal end (341) partly projecting from the annular face (35).
11. A gas cooker according to any of the preceding claims, wherein a protection cap (41), made of a metallic material, is placed on each rib (34) so that it (41) resides between the resilient member (53) and its respective rib (34) during contact.
12. A gas cooker according to claim 11, wherein said

protection caps (41) are part of a protection bracelet (40) placed to the knob body (30) and having a flat cross section.

13. A gas cooker according to claim 12, wherein said protection bracelet (40) comprises a bracelet section (42) extending along the inner face of the knob body's side wall (31) in a manner of resting onto said inner face.

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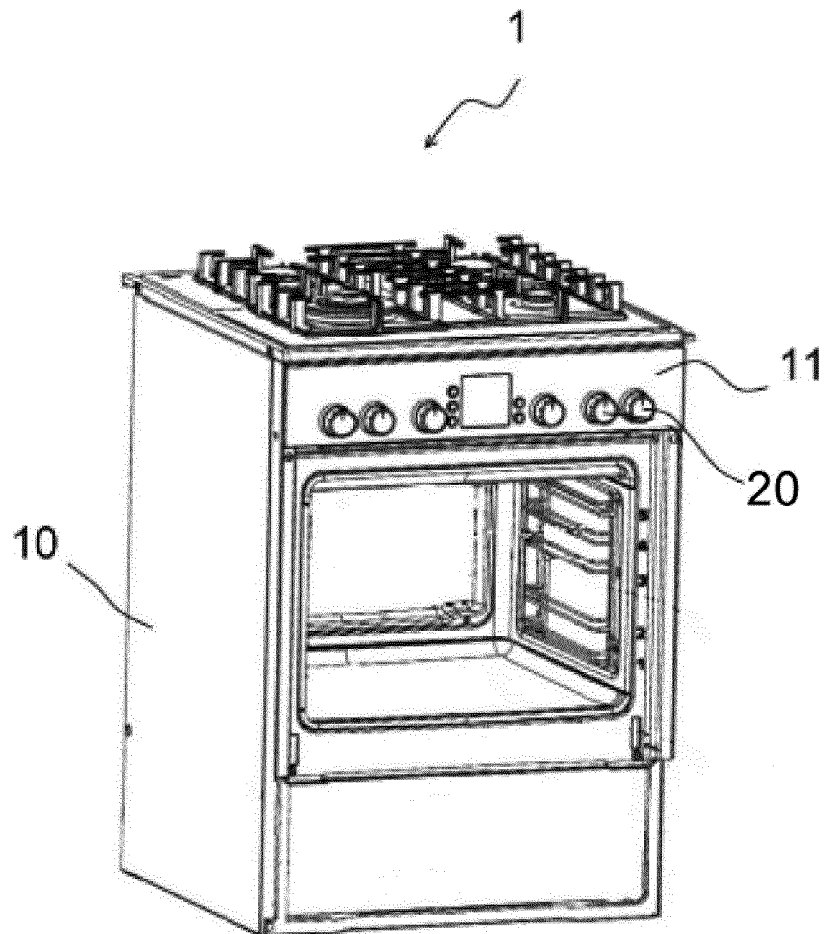


Figure 1

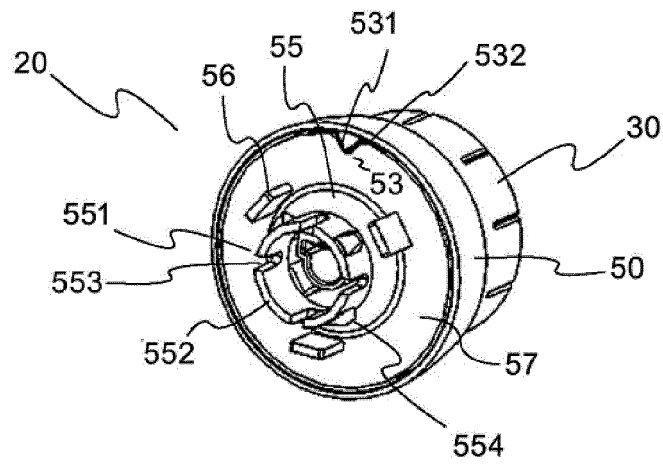


Figure 2a

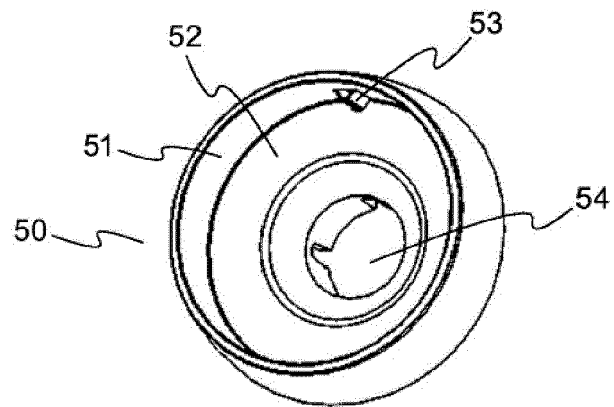


Figure 2b

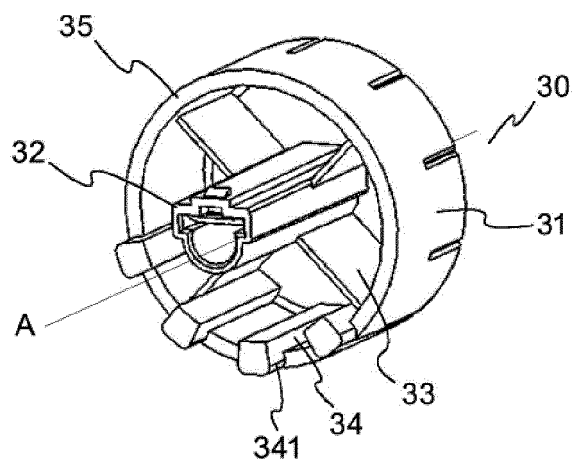


Figure 2c

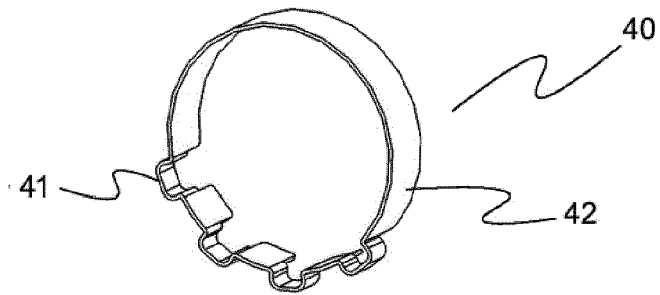


Figure 3a

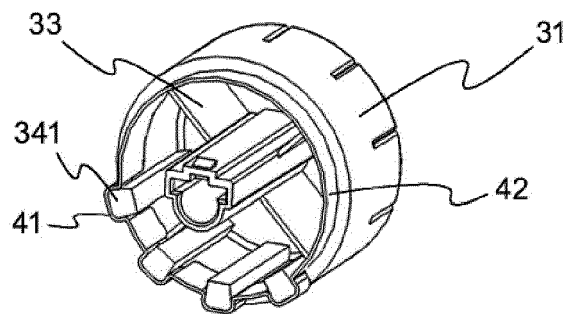


Figure 3b

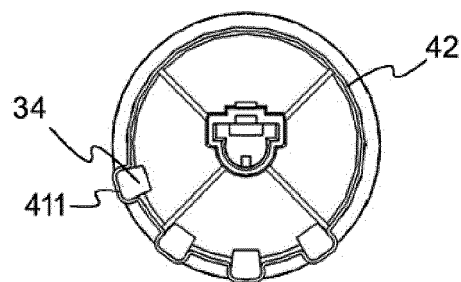


Figure 3c

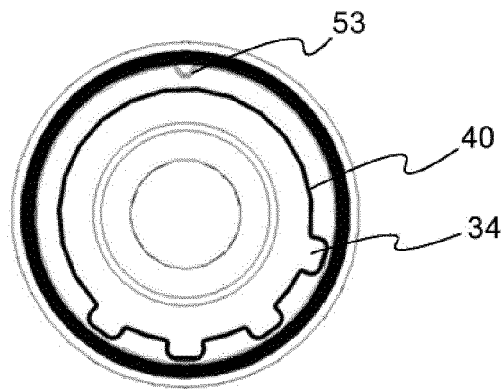


Figure 4a

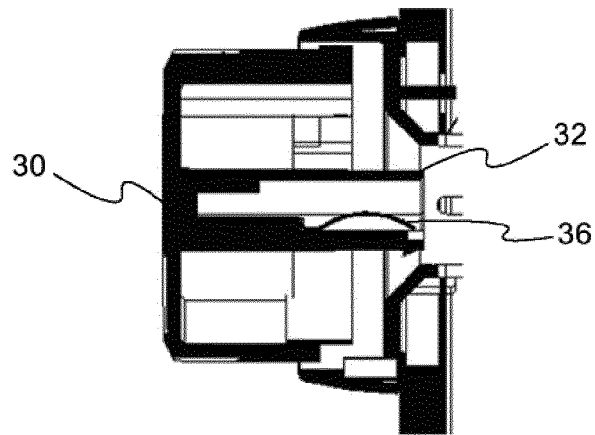


Figure 4b

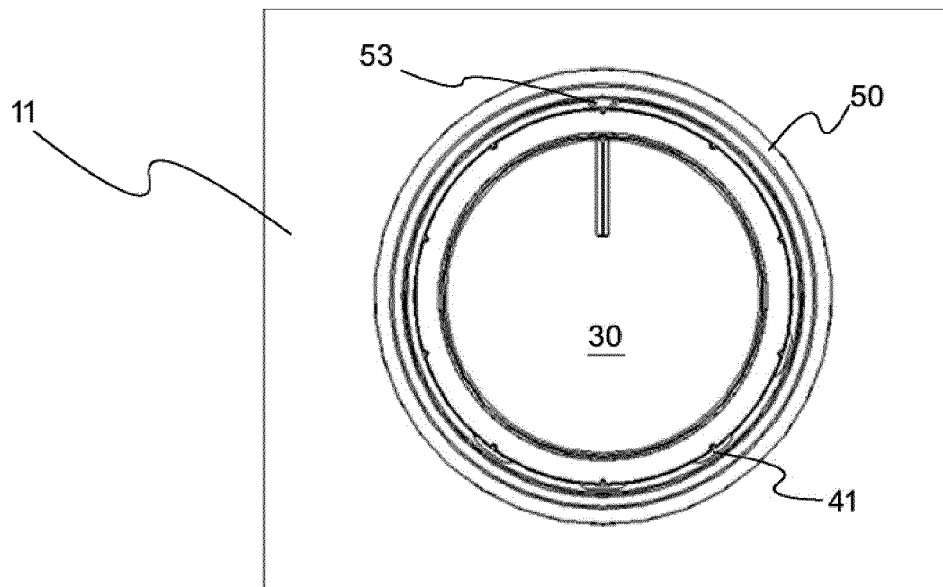


Figure 5a

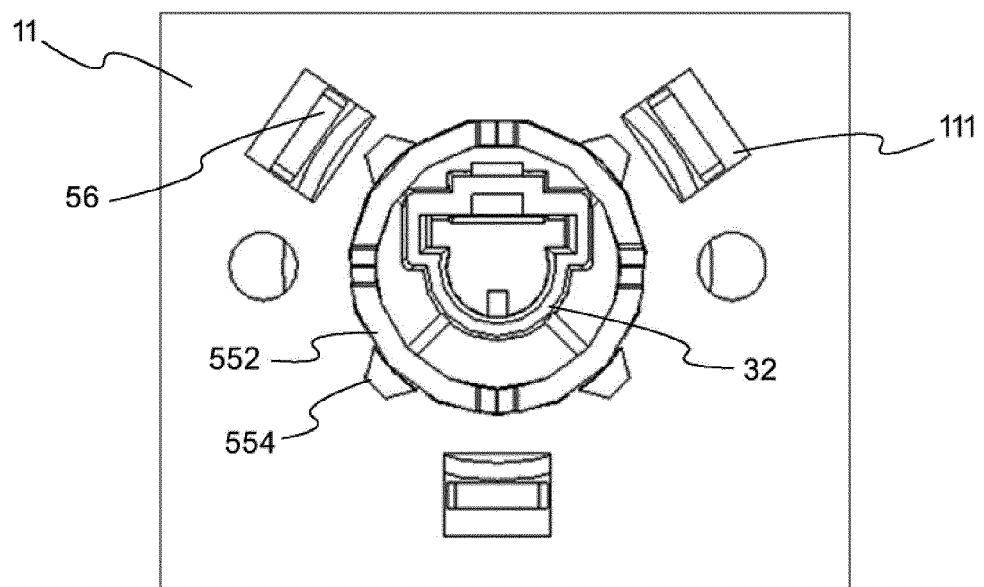


Figure 5b

REFERENCES CITED IN THE DESCRIPTION

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