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(54) **A home appliance with control knob**

(57) The present invention relates to a home appliance control knob comprising a cover (20) and a body (10) placed onto the cover (20), where said cover (20) has a body opening (24) and where the body (10) has a front surface (133) placed onto said body opening (24). Accordingly in the subject matter invention, there is at least one locking leaf (21) which is in the form of an inward

extension from the inner lateral surface of said cover (20); at least one locking tab (112) which is positioned on the outer circumference of the body; and at least one placement housing (114) which is formed at the continuation of said locking tabs (112) on the body and wherein the locking leaf (21) is placed are provided, whereby the snap-fit assembly between the body (10) and cover (20) is ensured.

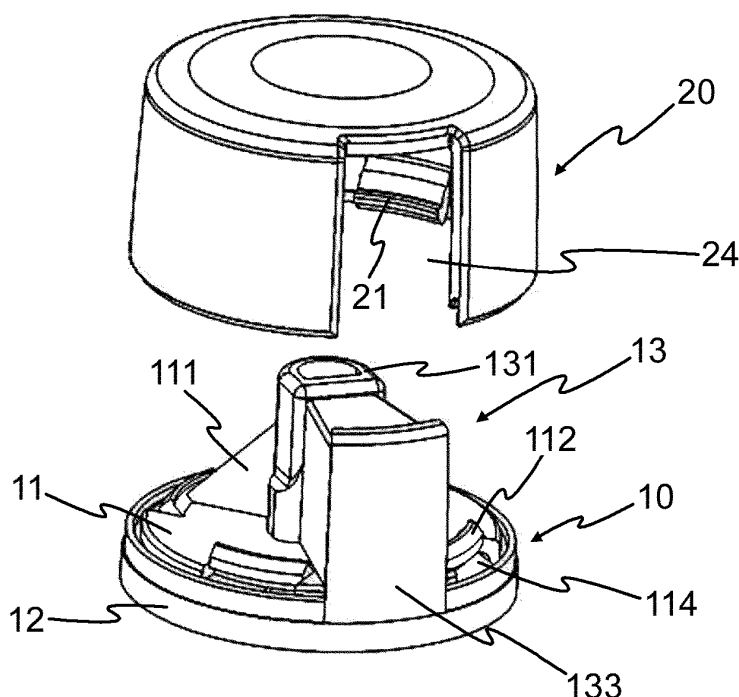


Fig. 2

Description

[0001] The present invention relates to control knobs used for adjusting a plurality of parameters of home appliances, and particularly relates to a home appliance control knob which is rotatable and which comprises a hollow cover and a body placed onto said cover, where said cover has a body opening and where said body has an externally seen front surface which is placed to said body opening.

PRIOR ART

[0002] In order to adjust a plurality of parameters (program, temperature adjustment, etc.) in home appliances, control knobs with different shapes are used. One of these is the knobs realizing the desired adjustment by being rotated around themselves. As an example to these knobs, control knobs providing the adjustment of the flame amount of a stove or control knobs providing the adjustment of the temperature degree of an oven can be given.

[0003] One of the rotating knob embodiments is the two piece knobs used in home appliances since they are esthetic. In general, such types of control knobs comprise two pieces called body and cover. The cover part which is hollow and whose one surface has a structure similar to an open cylinder functions as a female piece in this structure, accordingly, the body part which functions as the male part is placed onto the cover. When the assembly is completed, the body extension which is called body extension in the related technical field and which completes the cover can be seen from outside. Since the body or at least said body extension is different from the cover in terms of color or in terms of the material used, the obtained knob embodiment provides an esthetical appearance. In the present art, this body and the cover are fixed to each other by means of ultrasonic welding. This method increases the production costs and production time.

[0004] In the patent application GB 2165033, a rotary knob is disclosed which is used in household appliances such as cookers, washing machines or the like. In more details, said control knob is constructed in the form of a hollow cylindrical member and the end face of the hollow cylindrical rotary knob is closed by an exchangeable front face which is held on the rotary knob by means of a snap connection.

[0005] In the patent application US6627828, a control member for gas appliances is disclosed. Said control member comprises an outer casing through which the gas valve arm passes and which has the first and second casing pieces which are snap-fittingly secured together.

[0006] In the patent application DE102004020825, in order to provide electrical control of household appliances like cooker and the like, a control member which is rotatably and detachably mounted on the operating surface of the appliance by magnetic force is disclosed. The

external parts of the operating element are formed by a movable plate with its movable surface mounted on the operating surface, and a hollow gripping component is fastened in the movable plate preferably by a snap-fit connection.

[0007] In the abovementioned patents where the control members comprising snap-fit connected parts are disclosed, the snap-fit connection of the externally seen body part to the cover part is not disclosed.

BRIEF DESCRIPTION OF THE INVENTION

[0008] An object of the subject matter invention is to provide a two-piece control knob which can be manufactured in a shorter time and with a lower cost, and which provides the operator faults to be at minimum because of the particular structure thereof.

[0009] Another object of the subject matter invention is to provide a two-piece control knob with longer usage duration.

[0010] Another object of the subject matter invention is to provide a two-piece control knob whose body and cover part can be connected to each other by snap-fit connection. These objects are solved by a rotatable control knob comprising features of claim 1, and a home appliance comprising features of claim 13.

[0011] A rotatable control knob of the present invention comprising a hollow cover and a body placed onto said cover connected to each other by a snap-fit assembly, wherein said snap-fit assembly comprising at least one locking leaf which is in the form of an inward extension from the inner lateral surface of said cover and which has a resting surface facing the cover upper surface at the end part thereof; at least one locking tab which is positioned on the outer circumference of the body so as to correspond to said locking leaf and which has a resting surface which contacts with the resting surface of said locking leaf from above.

[0012] In more details, in order to realize all of the abovementioned objects which are obtained from the below mentioned detailed description, a preferred embodiment of the present invention relates to improvements realized on a rotatable home appliance control knob comprising a hollow cover and a body placed onto said cover, where said cover has a body opening and where said body has an externally seen front surface placed onto said body opening. Accordingly, in the scope of said improvements, at least one locking leaf which is in the form of an inward extension from the inner lateral surface of said cover and which has a resting surface facing the cover upper surface at the end part thereof; at least one locking tab which is positioned on the outer circumference of the body so as to correspond to said locking leaf and which has a resting surface which contacts with the resting surface of said locking leaf from above; and at least one placement housing which is formed at the continuation of said locking tabs on the body and wherein at least the end part of the locking leaf is placed are provided.

ed, whereby the snap-fit assembly between the body and cover is ensured.

[0013] In a preferred embodiment of the invention the end of the locking leaf has a cross section like an inverse trapezoid. This is very helpful for engaging the leafs with each other and guiding these parts along each other.

[0014] In a preferred embodiment of the present invention, there is at least one couple of locking leafs which are positioned along the circumference of the cover inner lateral surface so that there is a certain distance in between.

[0015] In a preferred embodiment of the present invention, there is at least one couple of locking tabs positioned so as to correspond to said locking leafs along the outer circumference of the inner part of the body, and correspondingly, there is at least one couple of placement housings.

[0016] In a preferred embodiment of the present invention, there is an outer step extending peripherally along the outer part of said body, and correspondingly, there is a seating surface which forms the circumference of the open surface of the cover and which is based onto said outer step from above.

[0017] In a preferred embodiment said seating surface comprises a tapered part formed so as to be compliant with the depth of the outer step, especially so when the resting surfaces of the locking leaf and the locking tab come into contact, said tapered part rests onto the outer step.

[0018] In a preferred embodiment of the present invention, there is a peripheral recess which extends partially or completely with said seating surface along the lower circumference of the open surface of said cover, and correspondingly, there is a peripheral projection which exists on the circumference of the outer part of the body and which is embodied so as to be placed partially or completely into said peripheral recess.

[0019] In a preferred embodiment of the present invention, said peripheral recess has a step and the outer part of the body has an inner step whereon said step is placed and which is formed so as to extend inwardly at the continuation of the peripheral projection.

[0020] In a preferred embodiment of the present invention, said body comprises an upper part which also defines said front surface and which has a shaft bearing; and a shaft inlet through which the gas valve shaft passes.

[0021] The additional characteristics and advantages of the subject matter invention are disclosed from the example embodiments giving reference to the accompanied figures.

BRIEF DESCRIPTION OF THE FIGURES

[0022] In Figure 1, the representative view of a household appliance where the subject matter control knob will be applied is given.

[0023] In Figure 2, the perspective view of the dismantled form of the subject matter control knob is given.

[0024] In Figure 3, the perspective cross sectional view of the mounted form of the subject matter control knob is given.

[0025] In Figure 4, the zoomed view of the locking of the subject matter control knob is given.

[0026] In Figure 5, the bottom perspective view of the dismantled form of the subject matter control knob is given.

THE DETAILED DESCRIPTION OF THE INVENTION

[0027] In this detailed description, the subject matter improvement is explained with examples in order for the subject matter to be more understandable. Accordingly, in the detailed description below, the subject matter invention is explained to be applied to the knob (B) of a built-in oven (A) whose representative view is given in Figure 1. However, the subject matter invention can be applied to any appliance's any control knob which is rotatable and which has two pieces.

[0028] With reference to Figure 2, the subject matter control knob (B) comprises substantially a body (10) with a circular form, and a hollow cover (20) which is placed onto said body (10) by means of a snap-fit connection which is an improvement of the subject matter invention. The body (10) is circular and the cover (20) is in the form of a cylinder with an open surface (25). Said body (10) comprises an inner part (11); an outer part (12) which encompasses said inner part (11) so that there is peripheral housing (14) in between, and an upper part (13) extending upwardly from the upper region of the inner part (11). On the other hand, said cover (20) comprises a body opening (24) formed on the lateral surface, and during assembly, a front surface (133) defined by the upper part (13) of the body is placed onto said body opening (24) so as to be seen from outside. Said front surface (133) is used for esthetical reasons, and in general it has a different color from the other components of the control knob and it is called design piece or similar names are used in the related technical field.

[0029] With reference to Figure 3 and 4, the embodiments which are an improvement of the subject matter invention and which provide the body (10) and the cover (20) to connect to each other by snap-fit connection are as follows. On said cover's (20) side close to the open surface (25), there is a plurality of locking leafs (21) extending at a certain narrow angle downwardly and inwardly from the inner lateral surface of the cover (20). Said locking leafs (21) are positioned peripherally so that there are preferably equal spaces in between. On the end part (211) of each locking leaf (21), a flat resting surface (212) facing the upper surface of the cover (20) is formed. On the other hand, the end part (211) of the locking leaf (21) has a cross section like an inverse trapezoid.

[0030] Again with reference to Figure 4 and 5, in correspondence to each locking leaf (21), a plurality of lock-

ing tabs (112) are embodied on the outer periphery of the inner part (11) of the body (10), and placement housings (114) which are formed at the continuation of said locking tabs (112) and where at least the end part (211) of the corresponding locking leaf (21) is placed are embodied. The locking tab (112) has a flat resting surface (113) which contacts the resting surface (212) of the locking leaf (21) from above. In the alternative embodiment of the subject matter invention, said resting surfaces (113, 212) can be embodied so as to comprise serrated surfaces or so as to be in a form providing a female-male contact in order to provide a more effective locking. On the other hand, each locking tab (112) extends along an arc defined by a narrow angle so as to be compliant to the circular form of the body inner part (11), and each locking tab (112) has an upper part with a trapezoidal cross section so as to define a projection. Accordingly, when the cover (20) is pressed towards the body (10), firstly the angled lower surface of the end part (211) of the locking leaf (21) contacts with the angled upper surface of the locking tab (112). Thus, the locking leaf (21) bends backwardly and it passes through the placement housing (114), and when the end part (211) is separated from the locking tab (112), the locking leaf (21) returns to the former position. Thus, with reference to Figure 4, the resting surfaces (113, 212) of the locking tab and the locking leaf come into direct contact with each other.

[0031] With reference to Figure 5, in this preferred embodiment of the subject matter invention, 4 locking leafs (21), 4 locking tabs (112) where said locking leafs (21) hold on to are embodied, and 4 placement housings (114) where the end (211) part of the locking leafs (21) is placed are embodied. As a result, by means of these members which provide peripheral locking, the body (10) and the cover (20) can be locked with desired tightness in a snap-fit manner.

[0032] On the other hand, in order for the abovementioned connection to be firmer, additional improvements are also provided in the scope of the present invention. Accordingly, the body outer part (12) has a peripheral outer step (121) extending substantially along the middle part of the lateral surface thereof. A seating surface (23) which defines the periphery of the cover (20) open surface (25) rests onto said outer step (121). In order not to deteriorate the esthetical appearance, said seating surface (23) comprises a tapered part (231) formed so as to be compliant with the depth of the outer step (121). Accordingly, when the resting surfaces (113, 212) of the locking leaf and the locking tab come into contact, said tapered part (231) rests onto the outer step (121).

[0033] Again with reference to Figure 4, in a preferred embodiment of the subject matter invention, a peripheral recess (22) is embodied in the cover (20) open surface (25) periphery's part between said seating surface (23) and the locking leaf (21), and correspondingly, a peripheral tab (123) is embodied which extends along the periphery of the body outer part (12) and which enters into said peripheral recess (22) partially during assembly.

Said peripheral tab and recess (123, 22) are embodied so as to extend along all circular periphery completely or so as to extend for instance along only the locking leafs (21). With reference to Figure 4, the upper surfaces of the peripheral recess (22) and the peripheral tab (123) are curved so as to complete each other. On the other hand, the peripheral recess (22) has a step (221) extending inwardly, and correspondingly, the peripheral tab (123) has an inner step (122) formed so as to extend inwardly at the continuation thereof. This form which completes one another particularly has a function in the product type where the locking between the locking leaf (21) and the locking tab (112) is at a lower point. Actually, in the embodiment in Figure 4, such a form is not required. Since, locking is realized before the peripheral tab (123) enters into the peripheral recess (22). Thus, this embodiment realizes the required function with the same efficiency without the peripheral recess (22), peripheral tab (123) and the steps (122, 221).

[0034] In addition to the abovementioned detailed description, with reference to Figure 2 and 5, a shaft bearing (131) with a shaft inlet (132) is formed in the middle region of the upper part (13) of the body. The shaft of a gas valve, which is controlled by the control knob, passes through said shaft bearing (131). On the other hand, the body has at least one support rib (111) which extends between the shaft bearing (131) and the inner body upper surface and which preferably has triangular form.

[0035] The protection scope of the present invention is set forth in the annexed Claims and cannot be restricted to the illustrative disclosures given above, under the detailed description. It is because a person skilled in the relevant art can obviously produce similar embodiments under the light of the foregoing disclosures, without departing from the main principles of the present invention.

REFERENCE NUMBERS

[0036]

A: Oven	132 Shaft inlet
B: Control knob	133 Front surface
10 Body	14 Peripheral housing
11 Inner part	20 Cover
111 Support rib	21 Locking leaf
112 Locking tab	211 End part
113 Resting surface	212 Resting surface
114 Placement housing	22 Peripheral recess
12 Outer part	221 Step
121 Outer step	23 Seating surface
122 Inner step	231 Tapered part
123 Peripheral projection	24 Body opening
13 Upper part	25 Open surface
131 Shaft bearing	

Claims

1. A rotatable home appliance control knob comprising a hollow cover (20) and a body (10) placed onto said cover (20) connected to each other by a snap-fit assembly, **characterized by** said snap-fit assembly comprising at least one locking leaf (21) which is in the form of an inward extension from the inner lateral surface of said cover (20) and which has a resting surface (212) facing the cover (20) upper surface at the end part (211) thereof; at least one locking tab (112) which is positioned on the outer circumference of the body (10) so as to correspond to said locking leaf (21) and which has a resting surface (113) which contacts with the resting surface (212) of said locking leaf (21) from above. 5
2. A control knob according to claim 1, wherein at least one placement housing (114) which is formed at the continuation of said locking tabs (112) on the body (10) and wherein at least the end part (211) of the locking leaf (21) is placed are provided, whereby the snap-fit assembly between the body (10) and cover (20) is ensured. 10
3. A control knob according to claim 1 or 2, wherein the end part (211) of the locking leaf (21) has a cross section like an inverse trapezoid and/or said locking tab (112) has an upper part with a trapezoidal cross section. 15
4. A control knob according to any of the preceding claims, wherein an outer step (121) is provided extending peripherally along the outer part (12) of said body, and correspondingly, a seating surface (23) is provided which forms the circumference of the open surface (25) of the cover (20) and which especially is based onto said step (121) from above. 20
5. A control knob according to claim 4, wherein said seating surface (23) comprises a tapered part (231) formed so as to be compliant with the depth of the outer step (121), especially so when the resting surfaces (113, 212) of the locking leaf and the locking tab come into contact, said tapered part (231) rests onto the outer step (121). 25
6. A control knob according to any of the preceding claims, wherein a peripheral recess (22) is provided which extends partially or completely with said seating surface (23) along the lower circumference of the open surface (25) of said cover (20) and correspondingly, a peripheral projection (123) is provided which exists on the circumference of the outer part (12) of the body and which is embodied so as to be placed partially or completely into said peripheral recess (22). 30
7. A control knob according to claim 6, wherein said peripheral recess (22) has a step (221) and the outer part (12) of the body has an inner step (122) whereon said step (221) is placed and which is formed so as to extend inwardly at the continuation of the peripheral projection (123). 35
8. A control knob according to claim 6 or 7, wherein the upper surfaces of the peripheral recess (22) and the peripheral tab (123) are curved so as to complete each other. 40
9. A control knob according to any of the preceding claims, wherein said cover (20) has a body opening (24) and where said body (10) has an externally seen front surface (133) placed onto said body opening (24). 45
10. A control knob claim 9, wherein said body comprises an upper part (13) which also defines said front surface (133) and which has a shaft bearing (131); and a shaft inlet (132) through which the gas valve shaft passes. 50
11. A control knob according any of the preceding claims, wherein at least one couple of locking leafs (21) are provided which are positioned along the circumference of the cover (20) inner lateral surface so that there is a certain distance in between. 55
12. A control knob according to any of the preceding claims, wherein at least one couple of locking tabs (112) are provided which are positioned so as to correspond to said locking leafs (21) along the outer circumference of the inner part (11) of the body and correspondingly, at least one couple of placement housings (114) are provided.
13. A household appliance with a control knob according to any of the preceding claims.

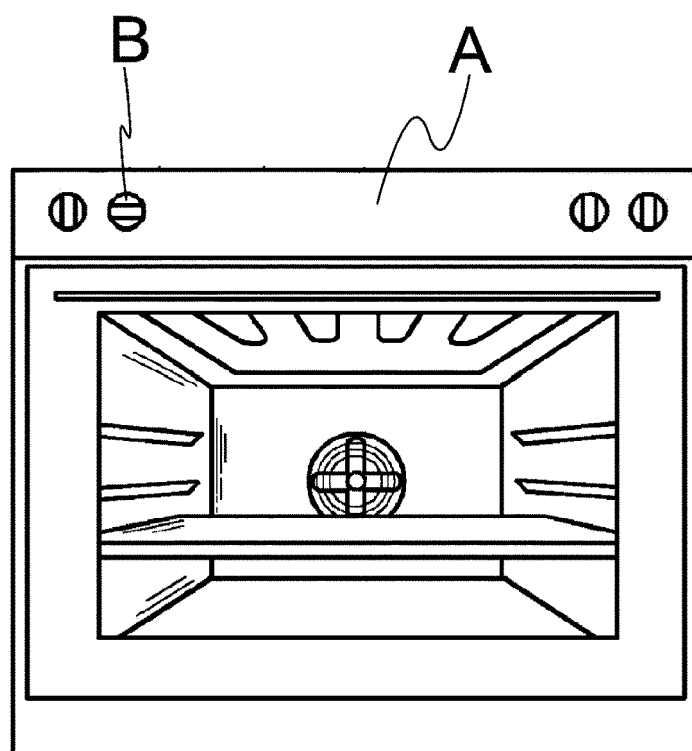


Fig. 1

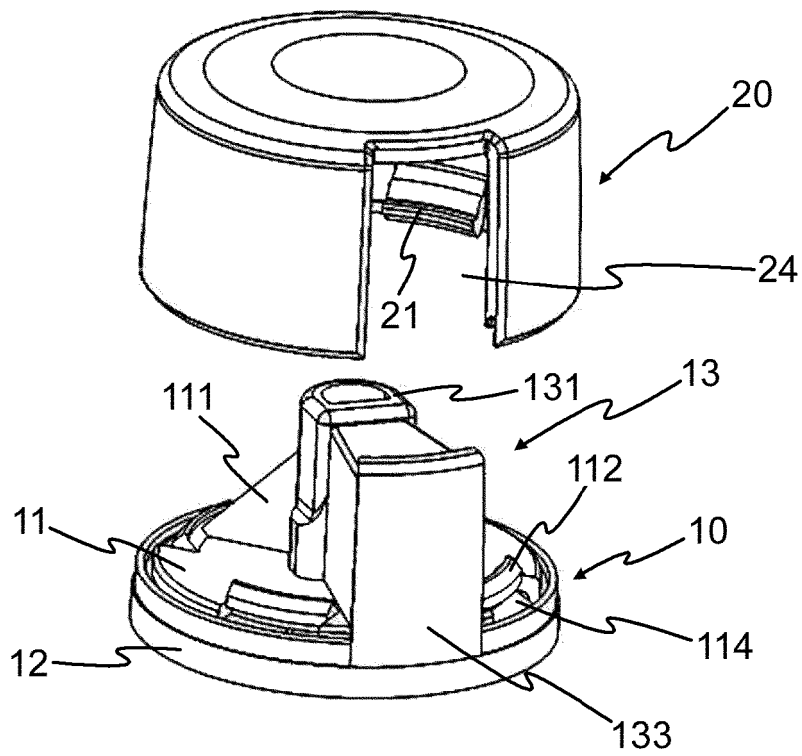


Fig. 2

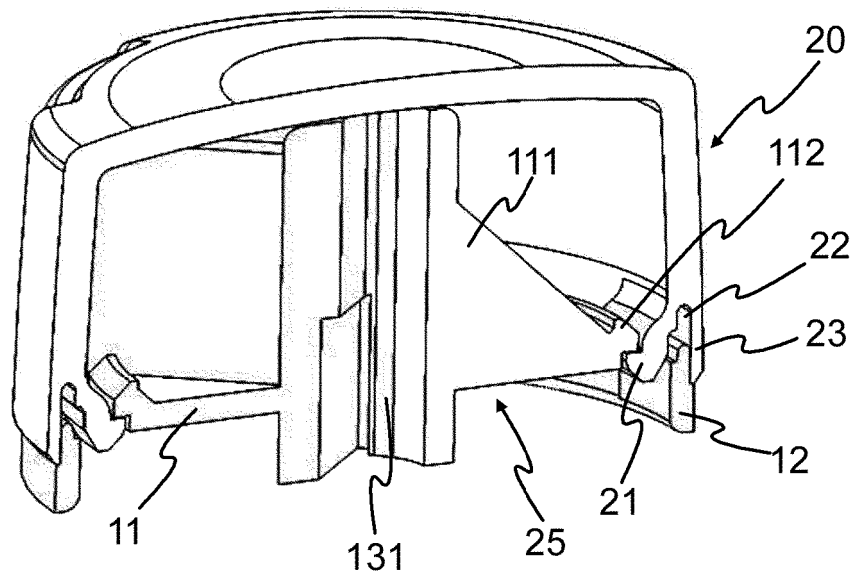


Fig. 3

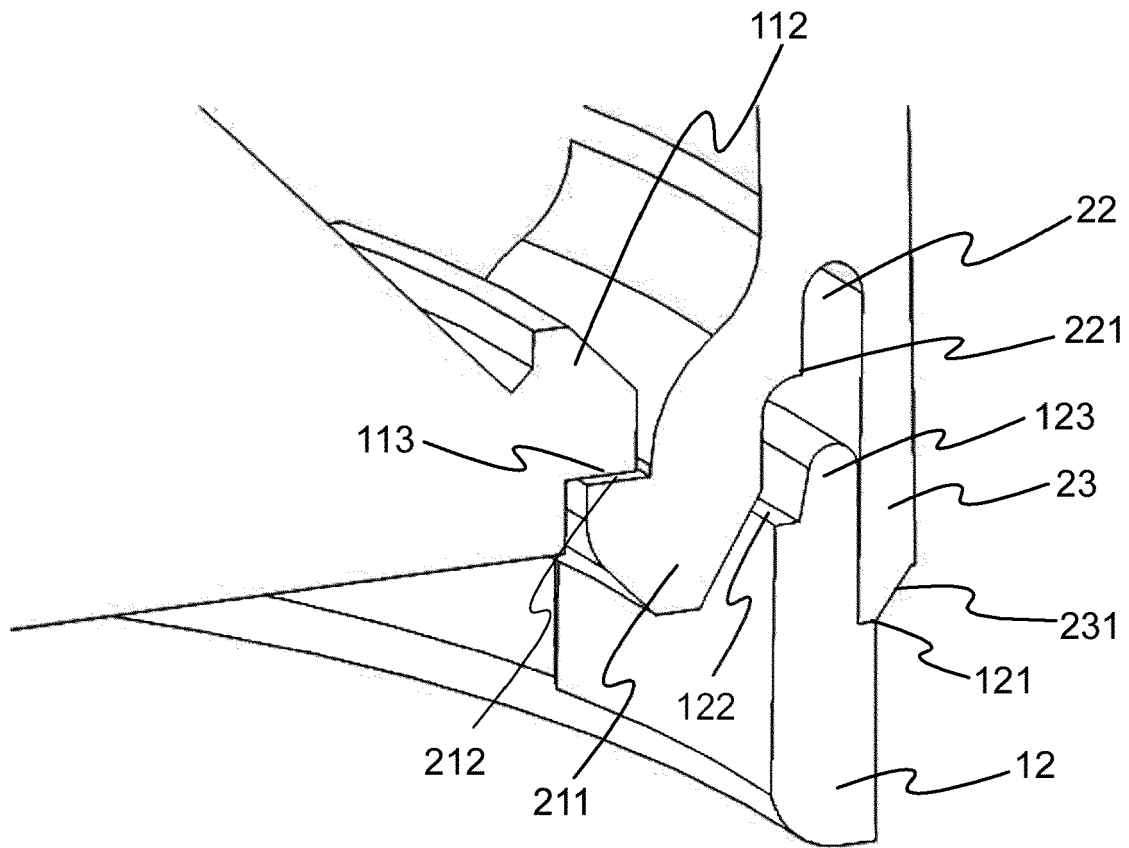


Fig. 4

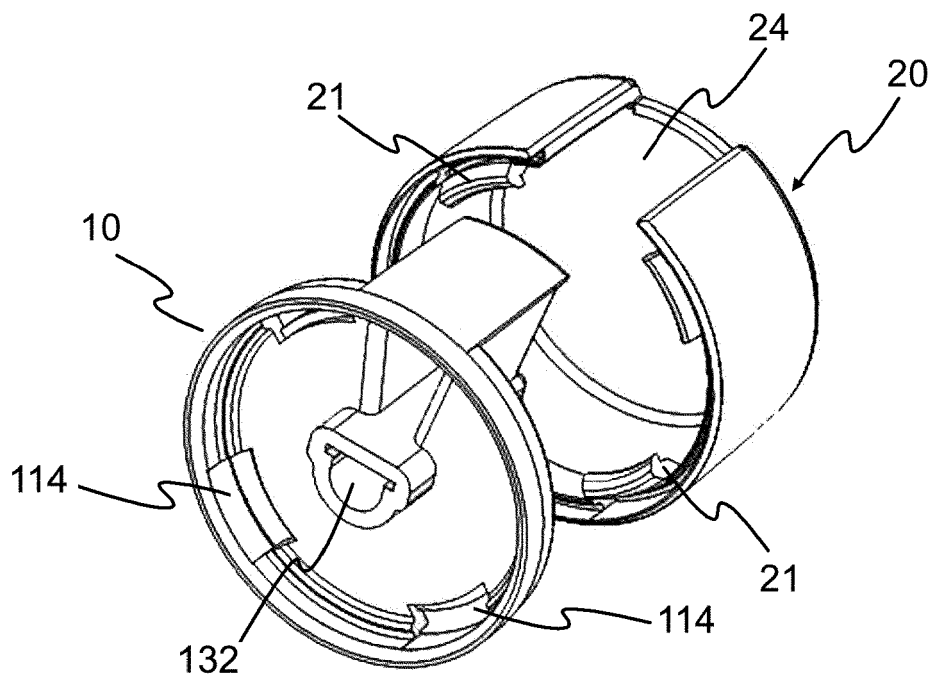


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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