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(54) **HOUSEHOLD APPLIANCE COMPRISING KNOB**

HAUSHALTGERÄT UMFASSEND EINES KNOPF

APPAREIL ÉLECTROMÉNAGER COMPRENANT UN BOUTON

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(73) Proprietor: **Arçelik Anonim Sirketi**

34950 Istanbul (TR)

(72) Inventors:

- **KAYMAK, Mehmet Ercan**
34950 Istanbul (TR)
- **CELIK, Kadir Ridvan**
34950 Istanbul (TR)
- **OZYUKSEL, Faik Emre**
34950 Istanbul (TR)
- **ATILLA, Yuksel**
34950 Istanbul (TR)

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Description

[0001] The present invention relates to a household appliance comprising a knob.

[0002] In household appliances, knobs providing the operation of the household appliance or the adjustment of programs parameters are widely used. In terms of ease of utilization and decorative appearance, the peripheries of the knobs are illuminated. In order to illuminate the peripheries of the knobs, generally light emitting diode (LED) light bulbs are placed into the housing whereto the knob is mounted. Since the LED light bulbs are required to be disposed to the limited area behind the knob, problems occur in the production during the assembly and the labor hours spent for intervention in case of a malfunction increase.

[0003] In the state of the art United States Patent No. US6348772, a knob is described comprising LED light bulbs. LED light bulbs are positioned behind the knob.

[0004] In the state of the art International Patent Application No. WO2010089556, a household appliance is described, that comprises a knob the outer periphery of which is illuminated by means of the light sources positioned in the housing. EP 1 995 751 A2 discloses a household appliance comprising an opening arranged on a body; a cylindrical knob, which is moved by being rotated and pushed, and at least one light source that emits light into the housing, a transparent illumination aperture extending along the line where the front and lateral surfaces of the knob intersect; and a carrier whereon the light source is placed so as to illuminate the illumination aperture when the knob is placed into the housing.

[0005] The aim of the present invention is the realization of a household appliance comprising a knob of which the outer periphery is illuminated and ease of assembly is provided.

[0006] The household appliance realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof comprises a housing placed into an opening on a body and a knob mounted into the housing. Light sources are placed at the rear side of the knob. The periphery of the knob is illuminated by means of an illumination aperture that transmits the light coming from the light source. The light sources are positioned on a carrier. The periphery of the knob is illuminated by means of the carrier and the illumination aperture.

[0007] In an embodiment of the present invention, the carrier is ring-shaped. Thus, the carrier can be easily placed into the housing.

[0008] In another embodiment of the present invention, the household appliance comprises two upright members that limit the movement of the knob while the knob is rotated right and left and a C-shaped carrier placed between the upright members. The C-shaped carrier can be easily placed between the upright members.

[0009] In an embodiment of the present invention, the household appliance comprises a stopper disposed on

the knob and protrusions disposed on the inner wall of the housing so as to provide the stopper to move in steps. When the knob is rotated by the user, the stopper is provided to pass over the protrusion and thus the user is enabled to sense that he/she brings the knob to the desired position.

[0010] In an embodiment of the present invention, the household appliance comprises a push-release mechanism having a first element with a heart-shaped channel, a second element with a pin suitable for moving in the channel and a spring providing the connection of the first element and the second element. Thus, the knob is enabled to enter the housing when pushed and stay inside the housing and to protrude from the housing when pushed again.

[0011] In an embodiment of the present invention, the carrier is placed between segment-shaped retainers. Thus, the carrier is easily mounted to the housing.

[0012] In an embodiment of the present invention, transparent parameter values are situated around the knob and an indicator is disposed on the housing, indicating which parameter value is activated when the user rotates the knob. In this embodiment, all the parameter values are illuminated.

[0013] In a derivative of this embodiment, there is a light transmitter which transmits the light received from the light source only to the parameter value indicated by the indicator. In this embodiment, only one light source is used in order to illuminate the parameter value at the level of the indicator.

[0014] In an embodiment of the present invention, the household appliance comprises a circuit board.

[0015] In a derivative of this embodiment, the circuit board is fixed to the housing by means of a connection member disposed behind the housing.

[0016] In a derivative of this embodiment, the connection between the knob and the circuit board is provided by means of a shaft. In this embodiment, the shaft passes through a first hole arranged on the base of the housing.

[0017] In a derivative of this embodiment, the cables whereto the light source is connected are fixed to the circuit board by passing through a second hole arranged on the base of the housing.

[0018] In an embodiment of the present invention, the light source is a LED light bulb. Consequently, energy saving is provided.

[0019] By means of the present invention, the assembly of the light sources used in the knobs, the peripheries of which are illuminated, to the household appliance is easily performed.

[0020] The model embodiments relating to a household appliance realized in order to attain the aim of the present invention are illustrated in the attached figures, where:

Figure 1 - is the perspective view of a household appliance.

Figure 2 - is the exploded view of a knob and a hous-

ing in an embodiment of the present invention.

Figure 3 - is the perspective view of a knob, a housing, an illumination aperture and an indicator when the knob is pressed in an embodiment of the present invention.

Figure 4 - is the exploded view of a knob and a housing in an embodiment of the present invention.

Figure 5 - is the exploded view of a knob, a housing, a push-release mechanism and a carrier in an embodiment of the present invention.

Figure 6 - is the exploded view of a knob, a carrier, a housing and a circuit board in an embodiment of the present invention.

Figure 7 - is the exploded view of a push-release mechanism in an embodiment of the present invention.

[0021] The elements illustrated in the figures are numbered as follows:

1. Household appliance
2. Opening
3. Housing
4. Knob
5. Light source
6. Illumination aperture
7. Carrier
8. Stopper
9. Protrusion
10. Channel
11. First element
12. Pin
13. Second element
14. Spring
15. Push-release mechanism
16. Retainer
17. Parameter value
18. Indicator
19. Light transmitter
20. Circuit board
21. Connection member
22. First hole
23. Shaft
24. , 124. Upright member
25. Second hole
26. Body

[0022] The household appliance (1) comprises an opening (2) arranged on the body (26), a housing (3) placed into t

[0023] he opening (2) and extending towards the inner part of the body (26) through the opening (2), a cylindrical knob (4) that is placed into the housing (3) and moved by being rotated and pushed, and at least one light source (5) that emits light into the housing (3).

[0024] The household appliance (1) of the present invention comprises a transparent illumination aperture (6) extending along the line where the front and lateral sur-

faces of the knob (4) intersect and a carrier (7) whereon the light source (5) is placed so as to illuminate the illumination aperture (6) when the knob (4) is placed into the housing (3).

[0025] The light source (5) is mounted on the carrier (7) before being placed into the housing (3). Afterwards, the knob (4) is placed into the housing (3). When the household appliance (1) is operated, the light source (5) emits light into the housing (3) by being activated. The knob (4) is moved in the housing (3) by being rotated and pushed. When the knob (4) is desired to be used, the user causes the knob (4) to protrude from the housing (3) by pressing on the knob (4). The user rotates the knob (4) in order to bring the knob (4) to the desired program parameter. The carrier (7) does not rotate while the knob (4) is being rotated in the housing (3). The user hides the knob (4) in the housing (3) by pressing on the knob (4) again after adjusting the desired program parameter by means of the knob (4). The light source (5) illuminates the periphery of the knob (4) by means of the illumination aperture (6) and the carrier (7) while the knob (4) is in the housing (3) and is used outside the housing (3) by being rotated (Figure 1, Figure 2).

[0026] In an embodiment of the present invention, the household appliance (1) comprises the ring-shaped carrier (7). In this embodiment, the carrier (7) is disposed at the rear side of the circular illumination aperture (6) and is in the same form as the illumination aperture (6).

[0027] In another embodiment of the present invention, the household appliance (1) comprises two upright members (24, 124) that extend from the base of the housing (3) towards the knob (4) and that limit the movement of the knob (4) in the housing (3), and the partial ring-shaped carrier (7) placed between the two upright members (24, 124). The upright members (24, 124) placed into the housing (3) limit the movement of the knob (4) in the housing (3) in both directions. In this embodiment, the carrier (7) is positioned at the level of the arc where the knob (4) moves so as to remain between the two upright members (24, 124). The partial ring-shaped carrier (7) is disposed at the rear side of the circular illumination aperture (6) (Figure 4).

[0028] In an embodiment of the present invention, the household appliance (1) comprises a stopper (8) disposed on the knob (4) and providing the knob (4) to remain in the desired position when rotated, and more than one protrusion (9) disposed on the inner wall of the housing (3) and enabling the user to sense that he/she selects the desired program parameter by passing over the stopper (8) with the movement of the knob (4). In this embodiment, the protrusions (9) are arranged in a circular manner in the housing (3) with certain intervals. Each protrusion (9) corresponds to a program parameter predetermined by the producer (Figure 4).

[0029] In an embodiment of the present invention, the household appliance (1) comprises a push-release mechanism (15) having a first element (11) with a channel (10) placed into the housing (3), a second element (13)

disposed behind the knob (4) with a pin (12) suitable for moving inside the channel (10) and a spring (14) that provides the second element (13) to move tautly while the pin (12) moves in the channel (10). The knob (4) is a push-release type that the knob (4) is outside the housing (3) when used and is hidden inside the housing (3) by being pushed when not used. During the back and forth movement of the pin (12) in the channel (10), the knob (4) exits and enters the housing (3) a little (Figure 7).

[0030] In an embodiment of the present invention, the household appliance (1) comprises more than one segment-shaped retainer (16) enabling the carrier (7) to be mounted to the housing (3) and placed such that a distance remains therebetween. The retainers (16) are placed at intervals and in two rows along the base of the housing (3). The carrier (7) is mounted between the retainers (16) (Figure 5).

[0031] In an embodiment of the present invention, the household appliance (1) comprises more than one transparent parameter value (17) that is situated around the knob (4) and rotates together with the knob (4), and an indicator (18) disposed on the housing (3) and providing the indication of the parameter value (17) adjusted by means of the knob (4). The user brings the desired parameter value (17) to the level of the indicator (18) by rotating the knob (4) (Figure 2, Figure 3).

[0032] In a derivative of this embodiment, the household appliance (1) comprises a light transmitter (19) extending from the light source (5) towards the illumination aperture (6) so as to provide the parameter value (17) at the level of the indicator (18) to be illuminated. In this embodiment, the light transmitter (19) extends at the level of the indicator (18) and the parameter value (17) remains between the light transmitter (19) and the indicator (18). All the parameter values (17) around the knob (4) are not illuminated (Figure 2).

[0033] In an embodiment of the present invention, the household appliance (1) comprises a circuit board (20) that is placed behind the housing (3) and that controls the operation of the selected program parameters.

[0034] In a derivative of this embodiment, the household appliance (1) comprises at least one connection member (21) that is disposed behind the housing (3) and that provides the circuit board (20) to be fixed to the housing (3) by being slid. Thus, the circuit board (20) is easily mounted to the housing (3).

[0035] In a derivative of this embodiment, the household appliance (1) comprises a first hole (22) arranged on the base of the housing (3) and a shaft (23) that is disposed at the lower part of the first element (11) and that transmits the movement of the knob (4) to the circuit board (20) by passing through the first hole (22) (Figure 6).

[0036] In a derivative of this embodiment, the household appliance (1) comprises a second hole (25) arranged on the base of the housing (3), through which the cables between the light source (5) and the circuit board (20) pass. Thus, the connection between the light source

(5) and the circuit board (20) is easily realized.

[0037] In an embodiment of the present invention, the household appliance (1) comprises a light source (5) which is a LED light bulb. Thus, illumination process is performed with less energy consumption.

[0038] In different embodiments of the present invention, the household appliance (1) is a cooling device, a laundry dryer, a cooking device, a washing machine or a dishwasher.

[0039] By the light source (5) being placed in the housing (3) by means of the carrier (7), ease of assembly is provided and thus the speed of production is increased. Furthermore, the carrier (7) allows the light source (5) to be easily changed in case of any malfunction.

[0040] It is to be understood that the present invention is not limited to the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A household appliance (1) comprising
 - an opening (2) arranged on a body (26),
 - a housing (3) placed into the opening (2) and extending from the opening (2) towards the inner part of the body (26),
 - a cylindrical knob (4) placed into the housing (3) and moved by being rotated and pushed, and
 - at least one light source (5) that emits light into the housing (3),
 - a transparent illumination aperture (6) extending along the line where the front and lateral surfaces of the knob (4) intersect and
 - a carrier (7) whereon the light source (5) is placed so as to illuminate the illumination aperture (6) when the knob (4) is placed into the housing (3).
2. The household appliance (1) as in Claim 1, **characterized by** the ring-shaped carrier (7).
3. The household appliance (1) as in Claim 1, **characterized by** two upright members (24, 124) that extend from the base of the housing (3) towards the knob (4) and that limit the movement of the knob (4) in the housing (3) and by the partial ring-shaped carrier (7) placed between the two upright members (24, 124).
4. The household appliance (1) as in any one of the above claims, **characterized by** a stopper (8) disposed on the knob (4) and providing the knob (4) to remain in the desired position when rotated and by more than one protrusion (9) disposed on the inner

wall of the housing (3) and enabling the user to sense that he/she brings the knob (4) to the desired position by passing over the stopper (8) with the movement of the knob (4).

5. The household appliance (1) as in any one of the above claims, **characterized by** more than one segment-shaped retainer (16) enabling the carrier (7) to be mounted to the housing (3) and placed such that a distance remains therebetween. 5
6. The household appliance (1) as in any one of the above claims, **characterized by** more than one transparent parameter value (17) that is situated around the knob (4) and that rotates together with the knob (4) and by an indicator (18) disposed on the housing (3) and providing the indication of the parameter value (17) adjusted by means of the knob (4). 10
7. The household appliance (1) as in Claim 6, **characterized by** a light transmitter (19) extending from the light source (5) towards the illumination aperture (6) so as to provide the illumination of the parameter value (17) at the level of the indicator (18). 15
8. The household appliance (1) as in any one of the above claims, **characterized by** a circuit board (20) that is placed behind the housing (3) and that controls the operation of the selected program parameters. 20
9. The household appliance (1) as in Claim 8, **characterized by** at least one connection member (21) that is disposed behind the housing (3) and that provides the circuit board (20) to be fixed to the housing (3) by being slid. 25
10. The household appliance (1) as in any one of the Claim 8 or Claim 9, **characterized by** a second hole (25) arranged on the base of the housing (3), through which the cables between the light source (5) and the circuit board (20) pass. 30
11. The household appliance (1) as in any one of the Claims 1 to 10, which is a cooling device. 35
12. The household appliance (1) as in any one of the Claims 1 to 10, which is a laundry dryer. 40
13. The household appliance (1) as in any one of the Claims 1 to 10, which is a cooking device. 45
14. The household appliance (1) as in any one of the Claims 1 to 10, which is a washing machine. 50
15. The household appliance (1) as in any one of the Claims 1 to 10, which is a dishwasher. 55

Patentansprüche

1. Ein Haushaltsgerät (1) umfassend,
 - eine Öffnung (2) angeordnet auf einem Gehäuse (26),
 - eine Aufnahme (3), die in die Öffnung (2) eingesetzt ist und von der Öffnung (2) ausgehend in die Innere des Gehäuses (26) erstreckt,
 - einen zylindrischen Knopf (4), der in die Aufnahme (3) hinein gesteckt und durch Drehen und Schieben bewegt wird, und
 - eine Lichtquelle (5), die Licht in die Aufnahme (3) ausstrahlt,
 - einen transparente Beleuchtungsspalt (6), die entlang der Linie, wo die Flächen des Knopf (4) und der seitlichen Wänden sich schneiden, erstreckt, und
 - einen Träger (7), worauf die Lichtquelle (5) aufgesetzt ist, um den Beleuchtungsspalt (6) nach dem Einstecken Knopfs (4) in die Aufnahme (3) zu beleuchten.
2. Haushaltsgerät (1) nach Anspruch 1 **gekennzeichnet durch** einen ringförmigen Träger (7)
3. Haushaltsgerät (1) nach Anspruch 1 **gekennzeichnet durch** zwei vertikalen Elementen (24, 124), die vom Boden der Aufnahme (3) ausgehend bis zum Knopf (4) erstrecken und die Bewegung des Knopfes (4) in der Aufnahme (3) einschränkt, sowie einen teilweise ringförmigen Träger (7), der zwischen zwei vertikalen Elementen (24, 124) eingesetzt ist.
4. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche **gekennzeichnet durch** einen Anschlag (8), den man auf den Knopf (4) einsetzt und der sicherstellt, dass der Knopf (4) in der gewünschten Position bleibt, wenn man ihn umdreht und mehrere Vorsprünge (9), die man in die innere Wand der Aufnahme (3) einsetzt und sie sicherstellen, dass der/die Anwender/Anwenderin es fühlt, dass der Knopf (4) in die gewünschte Position mittels der Bewegung des Knopfs (4) durch Übergehen über den Anschlag (8) gebracht ist.
5. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche **gekennzeichnet durch** mehrere intermittierende Halterteile (16), die die Montage des Trägers (7) in die Aufnahme (3) gewährleistet und die derart angeordnet werden, dass zwischen denen ein Abstand zurückbleibt.
6. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche **gekennzeichnet durch** mehrere transparente Parameterwertezeichen (17) die am Umfang des Knopfs (4) angeordnet sind und mit dem Knopf (4) zusammen rotieren, und eine Anzeige

(18), die auf die Aufnahme (3) eingesetzt wird und die sicherstellt, die eingestellte Parameterwerte (17) mittels des Knopfes (4) angibt.

7. Haushaltsgerät (1) nach Anspruch 6 **gekennzeichnet durch** einen Lichtemitter (19), der von der Lichtquelle (5) ausgehend bis zum Beleuchtungsspalt (6) erstreckt, um den Parameterwert (17) auf der Anzeige (18) zu beleuchten. 5
8. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche **gekennzeichnet durch** eine Leiterplatte (20), die hinter der Aufnahme (3) eingesetzt wird und die die Verfahrensparameter des gewählten Programms kontrolliert. 10
9. Haushaltsgerät (1) nach Anspruch 8 **gekennzeichnet durch** ein Anschlusselement (21), das hinter der Aufnahme (3) eingesetzt wird und sicherstellt, dass die Leiterplatte (20) durch Schieben in die Aufnahme (3) befestigt wird. 20
10. Haushaltsgerät (1) nach Anspruch 8 oder 9 **gekennzeichnet durch** ein zweites Bohrloch (25), wodurch die Kabeln zwischen der Lichtquelle (5) und der Leiterplatte (20) durchlaufen und das auf dem Boden der Aufnahme (3) angeordnet ist. 25
11. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche 1 bis 10 **gekennzeichnet durch** eine Kühlvorrichtung, 30
12. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche 1 bis 10 **gekennzeichnet durch** einen Wäschetrockner. 35
13. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche 1 bis 10 **gekennzeichnet durch** ein Kochgerät. 40
14. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche 1 bis 10 **gekennzeichnet durch** eine Waschmaschine. 45
15. Haushaltsgerät (1) nach einem der vorhergehenden Ansprüche 1 bis 10 **gekennzeichnet durch** eine Geschirrspülmaschine. 50

Revendications

1. Un appareil ménager (1) comprenant
 - une ouverture (2) disposée sur un corps (26),
 - un boîtier (3) placé dans l'ouverture (2) et s'étendant depuis l'ouverture (2) vers la partie interne du corps (26),
 - un bouton cylindrique (4) placé dans le boîtier

(3) et déplacé par rotation et en étant poussé, et
 - au moins une source lumineuse (5) qui émet de la lumière dans le boîtier (3),
 - une ouverture d'éclairage transparente (6) s'étendant le long de la ligne où les surfaces avant et latérales du bouton (4) se croisent et
 - un porteur (7) sur lequel la source lumineuse (5) est placée de manière à éclairer l'ouverture d'éclairage (6) lorsque le bouton (4) est placé dans le boîtier (3).

2. Appareil ménager (1) selon la revendication 1, **caractérisé par** le porteur en forme de bague (7).
3. Appareil ménager (1) selon la revendication 1, **caractérisé par** deux éléments verticaux (24, 124) qui s'étendent de la base du boîtier (3) vers le bouton (4) et qui limitent le mouvement du bouton (4) dans le boîtier (3) et par le porteur en forme de bague partielle (7) placé entre les deux éléments verticaux (24, 124).
4. Appareil ménager (1) selon l'une quelconque des revendications précédentes, **caractérisé par** un bouchon (8) disposé sur le bouton (4) et prévoyant que le bouton (4) reste dans la position désirée lorsqu'il est tourné et par plus d'une saillie (9) disposée sur la paroi intérieure du boîtier (3) et permettant à l'utilisateur de sentir qu'il/elle amène le bouton (4) à la position désirée en passant sur le bouchon (8) avec le mouvement du bouton (4).
5. Appareil ménager (1) selon l'une quelconque des revendications précédentes, **caractérisé par** plus d'un dispositif de retenue en forme de segment (16) permettant au porteur (7) d'être monté sur le boîtier (3) et placé de telle sorte qu'une distance reste entre ceux-ci.
6. Appareil ménagé (1) selon l'une quelconque des revendications précédentes, **caractérisé par** plus d'une valeur de paramètre transparente (17) qui est située autour du bouton (4) et qui tourne avec le bouton (4) et par un indicateur (18) disposé sur le boîtier (3) et fournissant l'indication de la valeur de paramètre (17) ajustée au moyen du bouton (4).
7. Appareil ménager (1) selon la revendication 6, **caractérisé par** un émetteur de lumière (19) s'étendant depuis la source lumineuse (5) vers l'ouverture d'éclairage (6) de manière à assurer l'éclairage de la valeur de paramètre (17) au niveau de l'indicateur (18).
8. Appareil ménager (1) selon l'une quelconque des revendications précédentes, **caractérisé par** une carte de circuit (20) qui est placée derrière le boîtier (3) et qui contrôle le fonctionnement des paramètres

de programme sélectionnés.

9. Appareil ménager (1) selon la revendication 8, **caractérisé par** au moins un élément de connexion (21) qui est disposé derrière le boîtier (3) et qui permet à la carte de circuit imprimé (20) d'être fixée au boîtier (3) en étant glissée. 5
10. Appareil ménager (1) selon l'une quelconque des revendications 8 ou 9, **caractérisé par** un second trou (25) disposé sur la base du boîtier (3), à travers lequel les câbles entre la source lumineuse (5) et la carte de circuit (20) passent. 10
11. Appareil ménager (1) selon l'une quelconque des revendications 1 à 10, qui est un dispositif de refroidissement. 15
12. Appareil ménager (1) selon l'une quelconque des revendications 1 à 10, qui est un sèche-linge. 20
13. Appareil ménager (1) selon l'une quelconque des revendications 1 à 10, qui est un dispositif de cuisson. 25
14. Appareil ménager (1) selon l'une quelconque des revendications 1 à 10, qui est un lave-linge.
15. Appareil ménager (1) selon l'une quelconque des revendications 1 à 10, qui est un lave-vaisselle. 30

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Figure 1

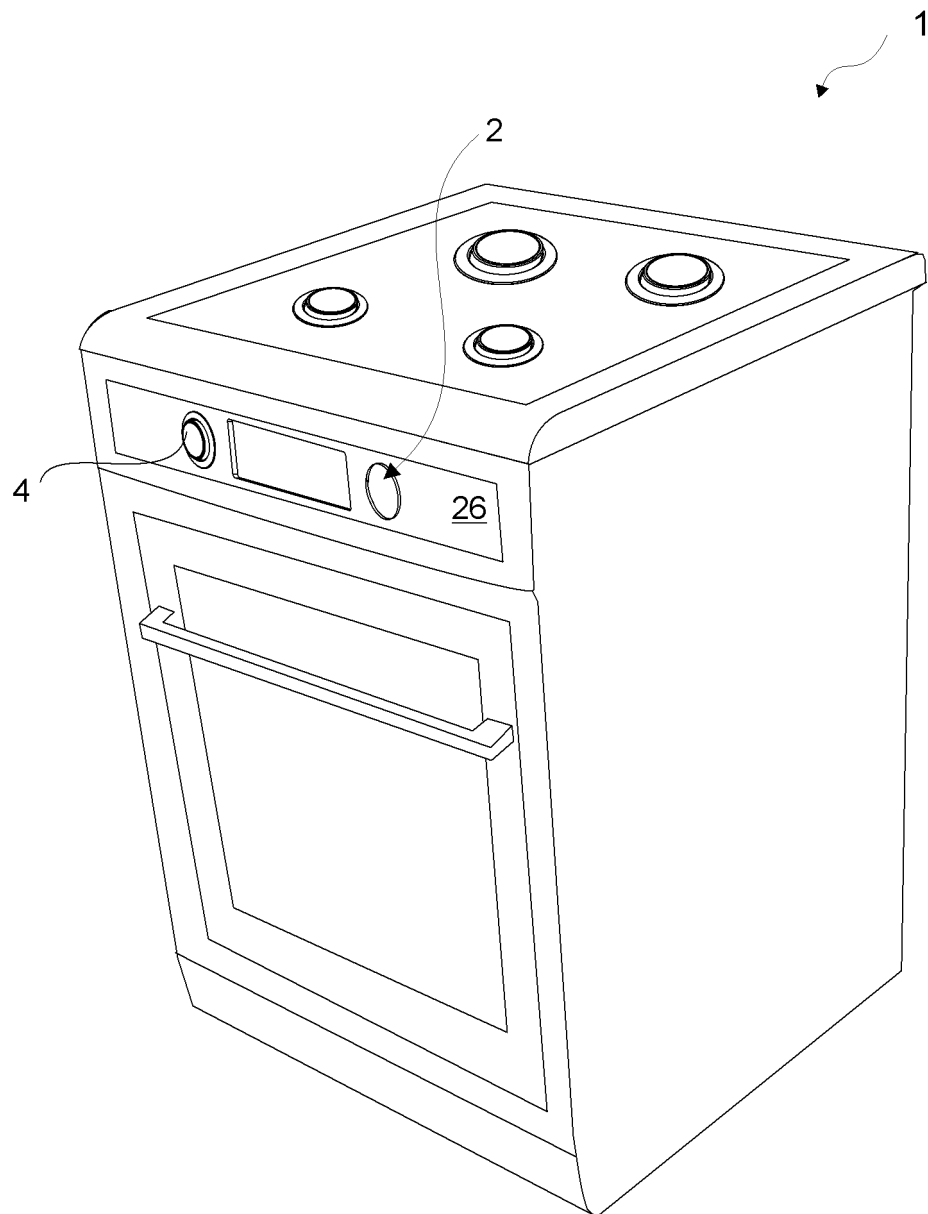


Figure 2

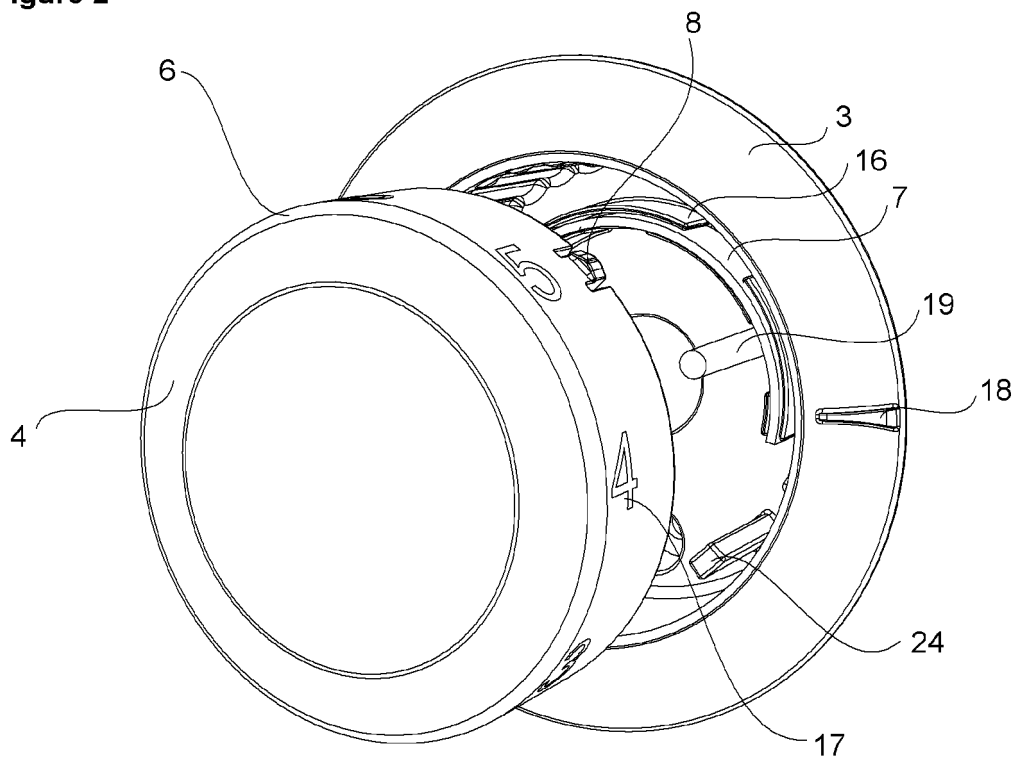


Figure 3

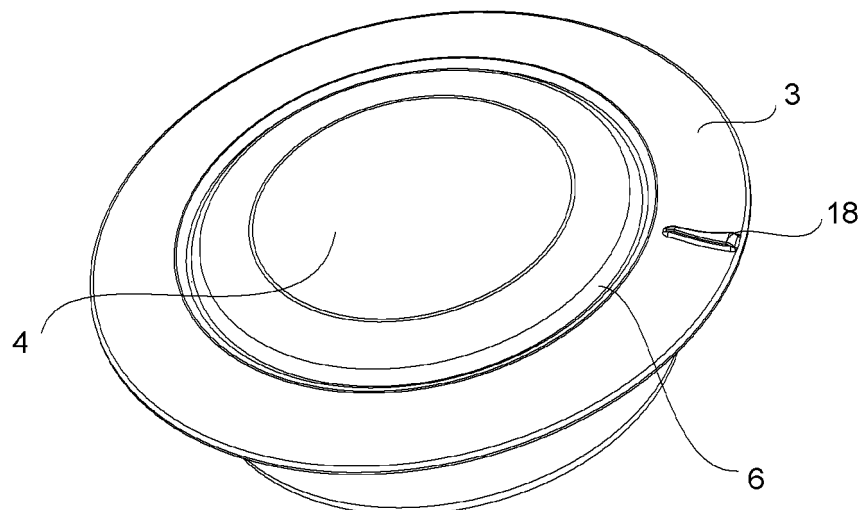


Figure 4

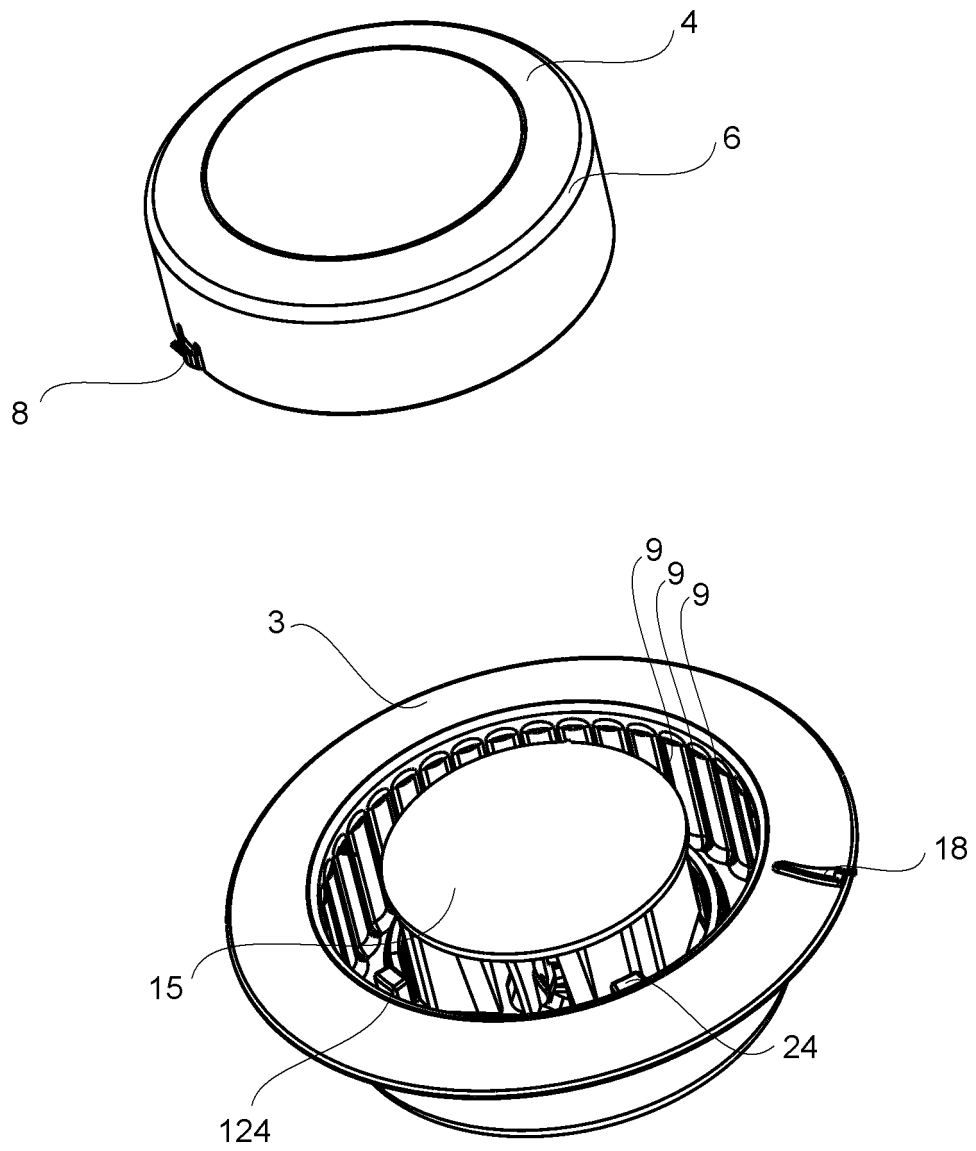


Figure 5

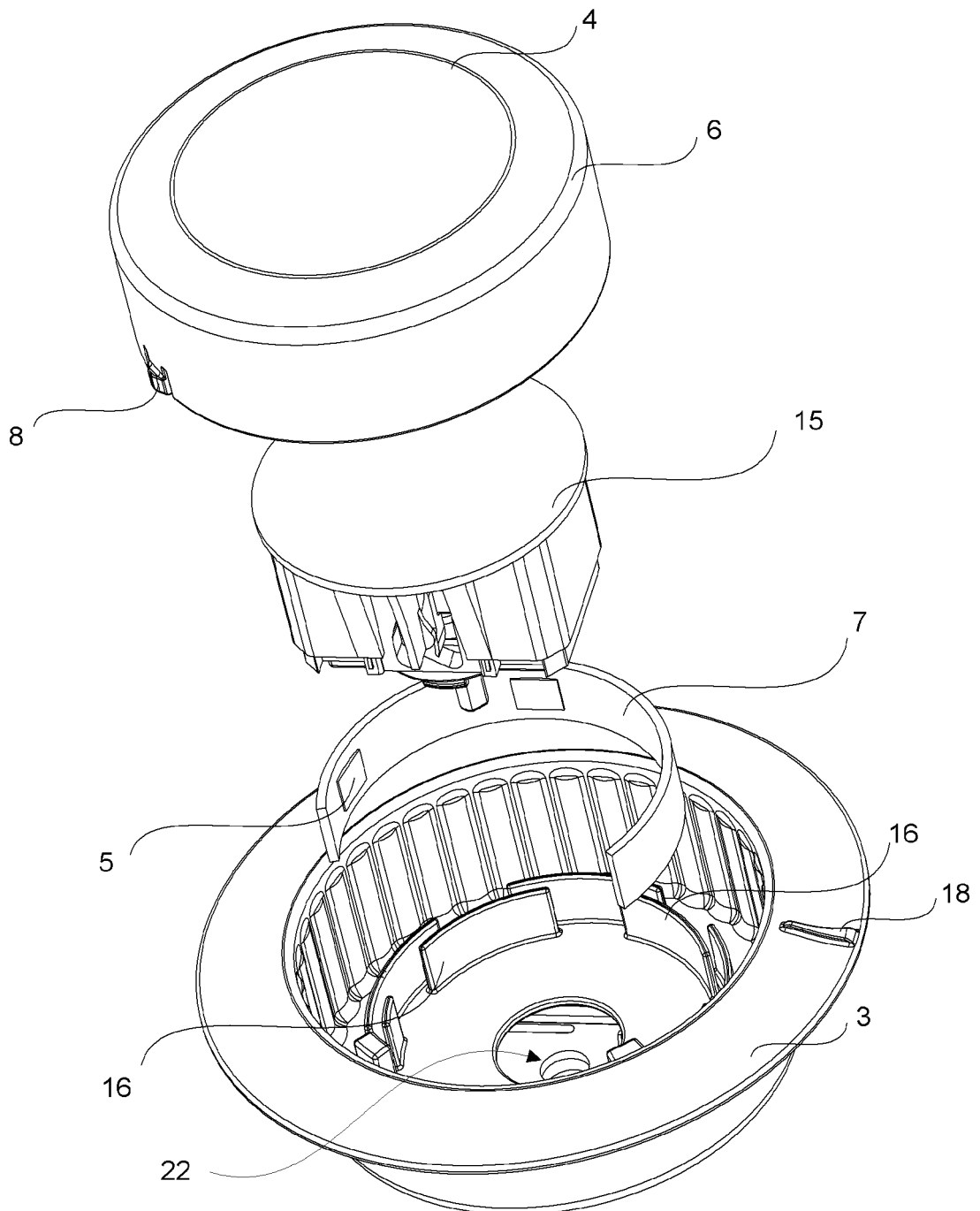


Figure 6

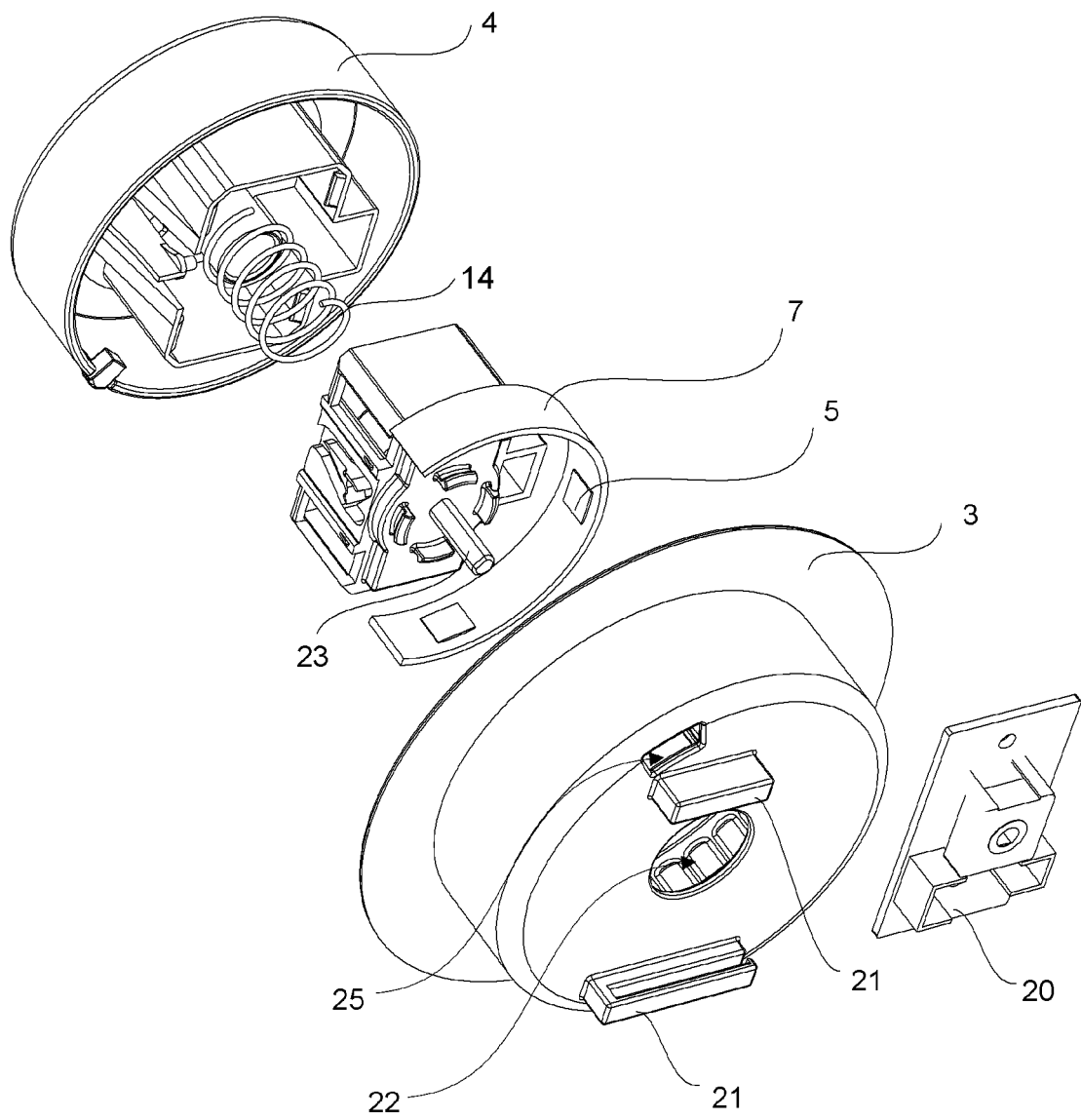
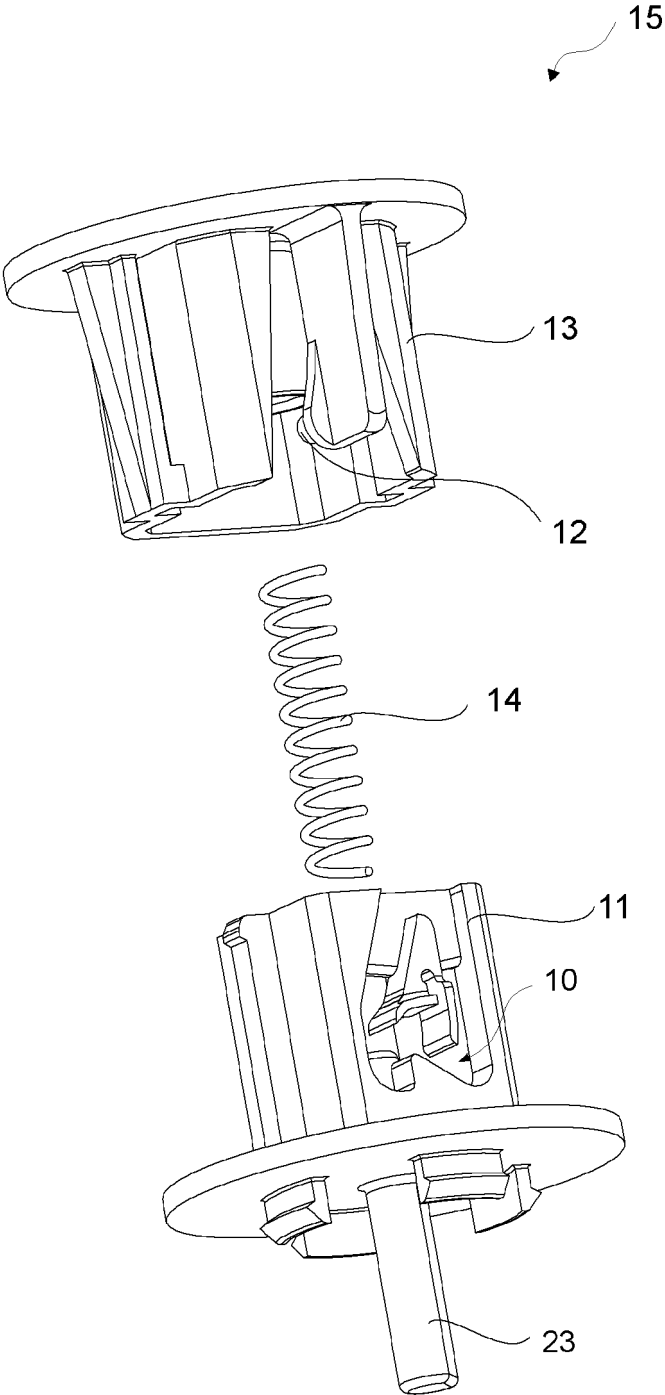


Figure 7



REFERENCES CITED IN THE DESCRIPTION

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