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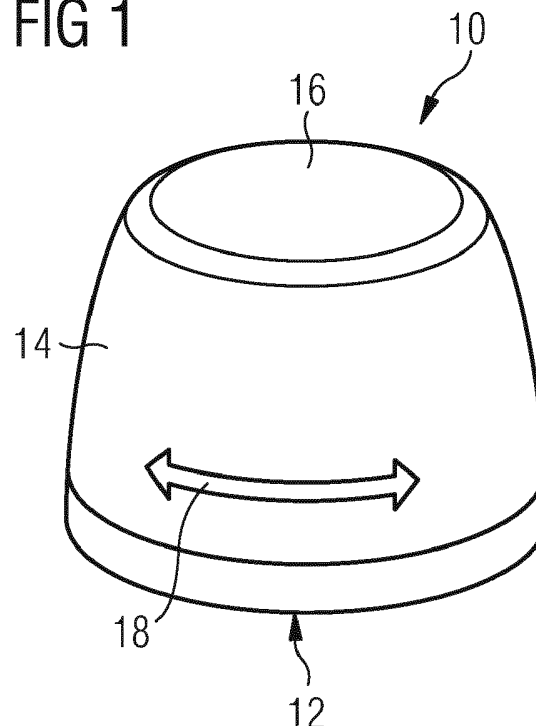
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(54) **REMOTE CONTROL DEVICE FOR A DOMESTIC APPLIANCE**

(57) The present invention relates to a remote control device (10) for at least one domestic appliance, in particular a cooking appliance. The remote control device (10) is a mobile and freestanding apparatus and is connected or connectable to the domestic appliance via at least one wireless connection. The remote control device

(10) includes at least one sensor for detecting a movement of said remote control device (10) and for generating a corresponding signal for the domestic appliance. The remote control device (10) includes at least one transmitter for sending commands corresponding with the detected signals to the domestic appliance.

**FIG 1**



## Description

**[0001]** The present invention relates to a remote control device for a domestic appliance. In particular, the remote control device is provided for a domestic appliance. Further, the present invention relates to a domestic appliance controllable or controlled by a remote control device.

**[0002]** Remote control devices for domestic appliances are often used for controlling said domestic appliances from a distance. For example, the infrared remote control device for a television allows activating and deactivating a plurality of functions of the television from the position of the user. Further, a tablet computer and a smartphone are also used for controlling domestic appliances. Application software stored in the tablet computer or smartphone allows automatic or semi-automatic controlling of the domestic appliances. In particular, a cooking appliance may be controlled by using the tablet computer or smartphone.

**[0003]** However, during a cooking process the user has wet fingers with oil, fat, salt and other ingredients. In this situation, the user does not want to touch the tablet computer or smartphone by sticky fingers, if the cooking appliance has to be operated. The user would wash his hands before touching the tablet computer or smartphone. If the cooking appliance has to be operated for several times, the cooking process becomes cumbersome.

**[0004]** It is an object of the present invention to provide a remote control device for a domestic appliance, which is easy to clean and allows operating a sufficient number of functions.

**[0005]** The object is achieved by the remote control device for a domestic appliance according to claim 1.

**[0006]** According to the present invention a remote control device for at least one domestic appliance, in particular for a cooking appliance, is provided, wherein:

- the remote control device is a mobile and freestanding apparatus,
- the remote control device is connected or connectable to the domestic appliance via at least one wireless connection,
- the remote control device includes at least one sensor for detecting a movement of said remote control device and for generating a corresponding signal for the domestic appliance, and
- the remote control device includes at least one transmitter for sending commands corresponding with the detected signals to the domestic appliance.

**[0007]** The main idea of the present invention is the autonomous remote control device. The commands to the domestic appliance are generated by predetermined movements of said remote control device.

**[0008]** In particular, the remote control device includes a base side, a circumferential side and a main side form-

ing a closed casing of said remote control device, wherein preferably the base side is planar and slidable on or at an arbitrary surface.

**[0009]** Further, the main side may be arranged opposite to the base side, wherein preferably the circumferential side is arranged between the base side and the main side. Said remote control device has a compact form and is inured to dirt, humidity, oil, fat, salt and other cooking ingredients.

**[0010]** For example, the at least one sensor is provided for detecting the movement of the remote control device, while the base side slides along the surface.

**[0011]** Preferably, the remote control device includes at least one sensor for detecting a rotation of said remote control device, while the base side slides along the surface, wherein preferably said sensor generates a corresponding signal for adjusting a continuous parameter for the domestic appliance in dependence of the rotation.

**[0012]** In particular, the remote control device includes at least one sensor for detecting the orientation of said remote control device, wherein preferably at least two different orientations of said remote control device correspond with at least one domestic appliance in each case. Different domestic appliances are controllable by the same remote control device.

**[0013]** Further, at least one key may be formed on the main side, wherein preferably said key is a touch key.

**[0014]** In a similar way, at least one base key may be formed on the base side, wherein preferably said base key is a touch key and/or a mechanical key.

**[0015]** Preferably, the key on the main side and/or the base key on the base side are provided for activating and/or deactivating the domestic appliance or components thereof and/or for starting and/or stopping a treatment of said domestic appliance.

**[0016]** Additionally, at least one touch sensitive portion may be formed on the base side, wherein preferably said touch sensitive portion is a touch slider.

**[0017]** In particular, the touch sensitive portion encloses at least partially the base key, wherein preferably said touch sensitive portion is subdivided into touch sensitive sectors. For example, said touch sensitive sectors may have the same size and/or shape. Alternatively, the touch sensitive sectors may have different sizes and/or shapes.

**[0018]** Alternatively to the base side mentioned above, the remote control device includes a circumferential side and a main side forming a casing with an open bottom side, wherein the remote control device includes a base part arranged within said open bottom side of the casing, and wherein the casing is rotatable relative to the base part, and wherein preferably the base part includes rubber attached at the bottom of said base part.

**[0019]** Advantageously, the casing of the remote control device may be rotation-symmetric, wherein the circumferential side encloses a rotational axis of said remote control device, and wherein the sensor for detecting the rotation of the remote control device detects said rotation around the rotational axis, and wherein preferably

the remote control device (10) includes a sensor for detecting, if said remote control device (10) has been tilted.

**[0020]** Moreover, the control device includes at least one receiver for receiving information from the domestic appliance, wherein preferably the remote control device includes at least one display element for indicating said information.

**[0021]** For example, the casing of the remote control device has the shape of a cylinder, a truncated cone, a spherical segment or ellipsoidal segment.

**[0022]** Furthermore, the main side of the remote control device may be planar or convex.

**[0023]** The wireless connection between the remote control device and the domestic appliance may be an infrared or Bluetooth connection. The wireless connection may be realised by visual signals, e.g. infrared or visible light signals, and/or by acoustic signals, e.g. ultrasonic, sound or melody signals. Further, the wireless connection may be realised by electronic signals, e.g. SAW, DF or BT signals.

**[0024]** Moreover, the remote control device may include at least one battery or rechargeable battery, wherein preferably said rechargeable battery is chargeable on a wireless charging system, for example on an induction cooking hob or at a charging station of a mobile device. In particular, the charging station is an induction charging station.

**[0025]** In particular, the casing of the remote control device is waterproof.

**[0026]** Further, the present invention relates to a domestic appliance, in particular a cooking appliance, controllable or controlled by the remote control device according to any one of the preceding claims, wherein the domestic appliance is connected or connectable to the remote control device via at least one wireless connection, wherein preferably said wireless connection is a bi-directional connection.

**[0027]** Said domestic appliance may include at least one display for indicating commands received from the remote control device, the execution and/or the results of said commands.

**[0028]** At last, the present invention relates to a system comprising at least one domestic appliance and at least one remote control device, wherein the system comprises at least one remote control device and/or at least one domestic appliance mentioned above.

**[0029]** Novel and inventive features of the present invention are set forth in the appended claims.

**[0030]** The present invention will be described in further detail with reference to the drawing, in which

FIG 1 illustrates a schematic perspective view of a remote control device for a domestic appliance according to a first embodiment of the present invention,

FIG 2 illustrates a further schematic perspective view of the remote control device for the domestic

appliance according to the first embodiment of the present invention,

FIG 3 illustrates a schematic perspective view of the remote control device for the domestic appliance according to a second embodiment of the present invention,

FIG 4 illustrates a schematic perspective view of the remote control device for the domestic appliance according to a third embodiment of the present invention,

FIG 5 illustrates a schematic perspective view of the remote control device for the domestic appliance according to a fourth embodiment of the present invention,

FIG 6 illustrates a schematic perspective view of the remote control device for the domestic appliance according to a fifth embodiment of the present invention, and

FIG 7 illustrates a schematic perspective view of a worktop including the domestic appliance and the remote control device according to the second embodiment of the present invention.

**[0031]** FIG 1 illustrates a schematic perspective view of a remote control device 10 for a domestic appliance according to a preferred embodiment of the present invention.

**[0032]** The remote control device 10 is a mobile and freestanding apparatus. The remote control device 10 is connected or connectable to one or more domestic appliances by a wireless connection. For example, said wireless connection is an infrared, a Bluetooth or the like. The wireless connection may be unidirectional or bidirectional. The remote control device 10 has a substantially rotation-symmetric shape. In this example, the shape of the remote control device 10 is similar to a cylinder or a truncated cone, wherein the shell surface is convex parallel to the rotational axis of the remote control device 10. The remote control device 10 includes a base side 12, a circumferential side 14 and a main side 16. The circumferential side 14 encloses the rotational axis of the remote control device 10 and forms the shell surface of the cylinder or truncated cone. Alternatively, the remote control device 10 has the shape of a spherical segment or an ellipsoidal segment. Further. The base side 12 and the main side 16 are arranged opposite to each other and perpendicular to the rotational axis of the remote control device 10. The base side 12 is plane, while the main side 16 is convex or plane. The base side 12 is slidable on or at an arbitrary surface.

**[0033]** The base side 12, the circumferential side 14 and the main side 16 form a closed casing of the remote control device 10. In this embodiment, a left-right arrow

18 is imprinted or bonded on the circumferential side 14. The left-right arrow 18 extends tangentially relating to the rotation axis of the remote control device 10. The left-right arrow 18 indicates the preferred rotating direction of the remote control device 10. The base side 12 is provided being in contact with an arbitrary surface of the domestic appliance or of its environment.

**[0034]** The remote control device 10 includes a plurality of sensors inside. One or more sensors of the remote control device 10 detect the position and the orientation of said remote control device 10. Further, the movement, i.e. the change of the position of the remote control device 10 is detected. Moreover, the rotation of the remote control device 10 is detected. In this example, the rotation around the rotation axis of the remote control device 10 is detected. One or more keys are arranged on the main side 16. Preferably, said keys are formed as touch sensors. A part of the sensors is responsive to the movement of the base side 12 relative to the aligning surface.

**[0035]** FIG 2 illustrates a further schematic perspective view of the remote control device 10 for the domestic appliance according to the preferred embodiment of the present invention. In particular, FIG 2 shows the base side 12 of the remote control device 10.

**[0036]** The base side 12 includes a base key 20 and a touch sensitive portion 22. The base key 20 is arranged in the centre of the base side 12, while the touch sensitive portion 22 encloses said base key. In particular, the base key 20 may be a touch key or a mechanical key. Preferably, the touch sensitive portion 22 is planar. For example, the touch sensitive portion 22 may be an annular touch slider. In this embodiment, the touch sensitive portion 22 is subdivided into four touch sensitive sectors 24. In general, the touch sensitive portion 22 may either form a continuous annular area or be subdivided into an arbitrary number of touch sensitive sectors 24. In this example, the touch sensitive sectors 24 have the same size and shape. Alternatively, the touch sensitive sectors 24 may have different sizes and/or different shapes.

**[0037]** Moving and rotating the remote control device 10 and touching the keys generate signals corresponding with commands for the domestic appliance. The domestic appliance receives said signals and executes operations corresponding with said commands.

**[0038]** The remote control device 10 is applicable in each orientation. Preferably, the orientation corresponds with one of the domestic appliances. For example, if the remote control device 10 lies on a worktop or on a table, so that the base side 12 is on the bottom side, then the remote control device 10 may control a cooking hob. In this case, a cooking zone of said cooking hob may be selected by moving the remote control device 10. Further, said cooking zone may be set or activated by touching the main side 16 of the remote control device 10. The power of said cooking zone may be adjusted by rotating the remote control device 10 around the rotational axis.

**[0039]** In another example, if the rotation axis of the remote control 10 extends horizontally, so that the base

side 12 extends vertically, then the remote control device 10 may control a cooking oven. In this case, the temperature of the oven cavity may be adjusted by rotating the remote control device 10 around the rotational axis. Further, the oven door may be opened by touching the main side 16 of the remote control device 10.

**[0040]** In a further example, if the remote control 10 is arranged upside-down, so that the base side 12 forms the top side and the main side 16 forms the bottom side, then the remote control device 10 may control an exhaust hood. In this case, the air flow of said exhaust hood may be adjusted by rotating the remote control device 10 around the rotational axis. Further, the exhaust hood may be activated and deactivated by touching the main side 16 of the remote control device 10.

**[0041]** The remote control device 10 includes a battery, in particular a rechargeable battery. Said rechargeable battery may be charged on an induction cooking hob or at a charging station of a mobile phone.

**[0042]** FIG 3 illustrates a schematic perspective view of the remote control device 10 for the domestic appliance according to a second embodiment of the present invention.

**[0043]** The remote control device 10 of the second embodiment includes the circumferential side 14 and the main side 16. The circumferential side 14 and the main side 16 form a casing with an open bottom side. Further, the remote control device 10 includes a base part 26 arranged within said open bottom side. In FIG 3 the base part 26 is covered by the circumferential side 14. The casing of the remote control device 10 is movable relative to the base part 26 along two directions. The casing is pushable downwards relative to the base part 26 along a first arrow 28 by a user. Preferably, the casing is automatically moved upwards again, after the casing has been released by the user. Further, the casing is rotatable relative to the base part 26 along a second arrow 30. **[Is this correct?]**

**[0044]** The rotation of the casing is provided for adjusting a value, while pushing down of said casing is provided for confirming the adjusted value. For example, the rotation of the casing is provided for adjusting a power value or a timer, while pushing down of said casing is provided for confirming the adjusted power value or time, respectively.

**[0045]** Preferably, the base part 26 includes rubber at its bottom. For example, a thin rubber layer forms the bottom side of said base part 26. The rubber avoids a sliding of the base part 26 and of the remote control device 10. The remote control device 10 of the second embodiment is stationary on the arbitrary surface, while the remote control device 10 of the first embodiment is slidable on said surface. **[Is this correct?]**

**[0046]** FIG 4 illustrates a schematic perspective view of the remote control device 10 for the domestic appliance according to a third embodiment of the present invention.

**[0047]** The remote control device 10 according to the third embodiment is similar as the remote control device

10 of the second embodiment. The casing of the remote control device 10 is rotatable relative to the base part 26 along the second arrow 30, but is not pushable downwards relative to said base part 26. Instead, four touch keys 32 are arranged on the main side 16. In this example, each touch key 32 is provided for selecting a cooking zone of a cooking hob.

[0048] FIG 5 illustrates a schematic perspective view of the remote control device 10 for the domestic appliance according to a fourth embodiment of the present invention.

[0049] The remote control device 10 according to the fourth embodiment is similar as the remote control device 10 of the third embodiment. The casing of the remote control device 10 is rotatable relative to the base part 26 along the second arrow 30. However, instead of the touch keys 32 a display element 34 is arranged on the main side 16. For example, the display element 34 is an LED, LCD or OLED display element. The display element 34 is provided for indicating information received from the domestic appliance. In this example, the display element 34 has a rectangular shape.

[0050] FIG 6 illustrates a schematic perspective view of the remote control device 10 for the domestic appliance according to a fifth embodiment of the present invention.

[0051] The remote control device 10 according to the fifth embodiment is a combination of the remote control devices 10 of the third and fourth embodiment. The remote control device 10 includes the four touch keys 32 on the one hand and the display element 34 on the other hand. The display element 34 is arranged in the centre of the main side 16. In this example, the display element 34 has a circular shape. The four touch keys 32 are arranged on the main side 16 and enclose the display element 34.

[0052] FIG 7 illustrates a schematic perspective view of a worktop 36 including the domestic appliance 38 and the remote control device 10 according to the second embodiment of the present invention. In this example, the domestic appliance 38 is a cooking hob. The remote control device 10 is arranged on the worktop 36 and besides the domestic appliance 38.

[0053] Preferably, the casing of the remote control device 10 is water proof and cleanable in a dishwasher. A so-called "find me"-function may be integrated in the remote control device 10 and/or in the corresponding domestic appliance and/or implemented in an application software.

[0054] According to the present invention a set of remote control devices 10 may be provided. Said set of remote control devices 10 allows the control of more domestic appliances and/or functions. Preferably, the remote control devices 10 of said set may have different colours and/or designs in order to distinguish the single remote control devices 10.

[0055] In general, the remote control devices 10 may be provided for arbitrary electric domestic appliances.

[0056] The domestic appliance may include a display

indicating the commands received from the remote control device 10, the execution and/or the results of said commands.

[0057] Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawing, it is to be understood that the present invention is not limited to that precise embodiment, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

## List of reference numerals

### [0058]

|    |                         |
|----|-------------------------|
| 10 | remote control device   |
| 12 | base side               |
| 14 | circumferential side    |
| 16 | main side               |
| 18 | left-right arrow        |
| 20 | base key                |
| 22 | touch sensitive portion |
| 24 | touch sensitive sector  |
| 26 | base part               |
| 28 | first arrow             |
| 30 | second arrow            |
| 32 | touch key               |
| 34 | display element         |
| 36 | worktop                 |
| 38 | cooking hob             |

## Claims

1. A remote control device (10) for at least one domestic appliance, in particular for a cooking appliance, wherein:

- the remote control device (10) is a mobile and freestanding apparatus,
- the remote control device (10) is connected or connectable to the domestic appliance via at least one wireless connection,
- the remote control device (10) includes at least one sensor for detecting a movement of said remote control device (10) and for generating a corresponding signal for the domestic appliance, and
- the remote control device (10) includes at least one transmitter for sending commands corresponding with the detected signals to the domestic appliance.

2. The remote control device according to claim 1, characterised in that

the remote control device (10) includes a base side (12), a circumferential side (14) and a main side (16) forming a closed casing of said remote control device (10), wherein preferably the base side (12) is planar and slidable on or at an arbitrary surface.

3. The remote control device according to claim 2,  
**characterised in that**  
the main side (16) is arranged opposite to the base side (12), wherein preferably the circumferential side (14) is arranged between the base side (12) and the main side (16).
4. The remote control device according to claim 2 or 3,  
**characterised in that**  
the at least one sensor is provided for detecting the movement of the remote control device (10), while the base side (12) slides along the surface.
5. The remote control device according to any one of the claims 2 to 4,  
**characterised in that**  
the remote control device (10) includes at least one sensor for detecting a rotation of said remote control device (10), while the base side (12) slides along the surface, wherein preferably said sensor generates a corresponding signal for adjusting a continuous parameter for the domestic appliance in dependence of the rotation.
6. The remote control device according to any one of the preceding claims,  
**characterised in that**  
the remote control device (10) includes at least one sensor for detecting the orientation of said remote control device (10), wherein preferably at least two different orientations of said remote control device (10) correspond with at least one domestic appliance in each case.
7. The remote control device according to any one of the claims 2 to 6,  
**characterised in that**  
at least one key is formed on the main side (16), wherein preferably said key is a touch key, and/or at least one base key (20) is formed on the base side (12), wherein preferably said base key (20) is a touch key and/or a mechanical key, and wherein particularly the key on the main side (16) and/or the base key (20) on the base side (12), respectively, are provided for activating and/or deactivating the domestic appliance or components thereof and/or for starting and/or stopping a treatment of said domestic appliance.
8. The remote control device according to any one of the claims 2 to 7,  
**characterised in that**

at least one touch sensitive portion (22) is formed on the base side (12), wherein preferably said touch sensitive portion (22) is a touch slider.

9. The remote control device according to claim 7 and 8, **characterised in that**  
the touch sensitive portion (22) encloses at least partially the base key (20), wherein preferably said touch sensitive portion (22) is subdivided into touch sensitive sectors (24).
10. The remote control device according to claim 1, **characterised in that**  
the remote control device (10) includes a circumferential side (14) and a main side (16) forming a casing with an open bottom side, wherein the remote control device (10) includes a base part (26) arranged within said open bottom side of the casing, and wherein the casing is rotatable relative to the base part (26), and wherein preferably the base part (26) includes rubber attached at the bottom of said base part (26).
11. The remote control device according to any one of the preceding claims,  
**characterised in that**  
the casing of the remote control device (10) is rotation-symmetric, wherein the circumferential side (14) encloses a rotational axis of said remote control device (10), and wherein the sensor for detecting the rotation of the remote control device (10) detects said rotation around the rotational axis, and wherein preferably the remote control device (10) includes a sensor for detecting, if said remote control device (10) has been tilted.
12. The remote control device according to any one of the preceding claims,  
**characterised in that**  
the remote control device (10) includes at least one receiver for receiving information from the domestic appliance, wherein preferably the remote control device (10) includes at least one display element (34) for indicating said information.
13. The remote control device according to any one of the preceding claims,  
**characterised in that**  
the remote control device (10) includes at least one battery or rechargeable battery, wherein preferably said rechargeable battery is chargeable on a wireless charging system, for example on an induction cooking hob or at a charging station of a mobile device.
14. A domestic appliance, in particular a cooking appliance, controllable or controlled by the remote control device (10) according to any one of the preceding claims, **characterised in that**

the domestic appliance is connected or connectable to the remote control device (10) via at least one wireless connection, wherein preferably said wireless connection is a bidirectional connection.

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15. A system comprising at least one domestic appliance and at least one remote control device (10), **characterised in that**

the system comprises at least one remote control device (10) according to any one of the claims 1 to 13 and/or at least one domestic appliance according to claim 14.

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FIG 1

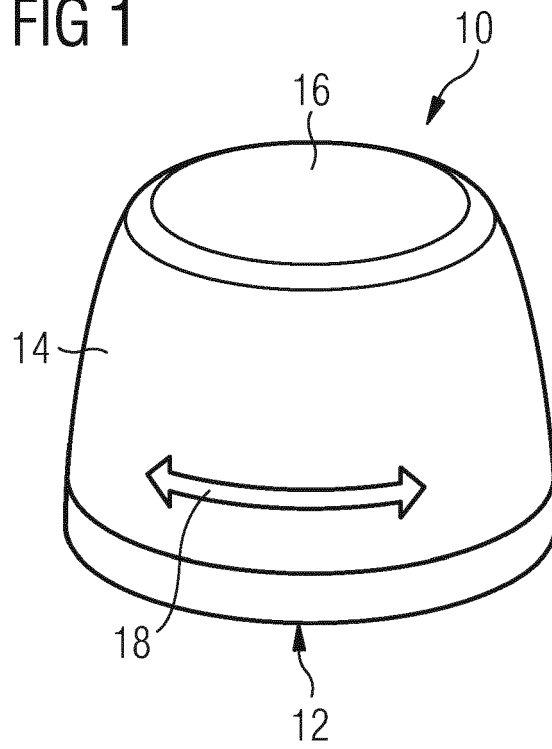


FIG 2

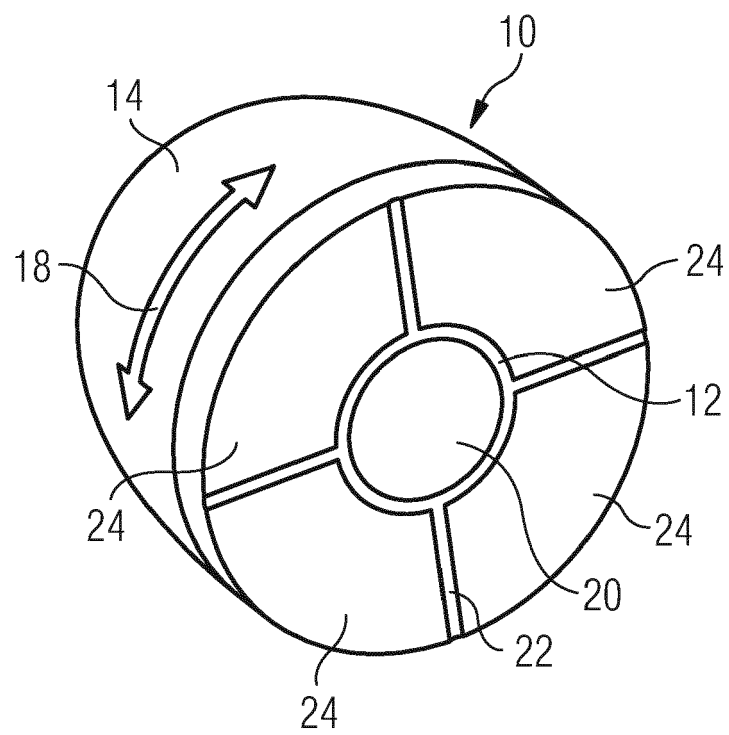


FIG 3

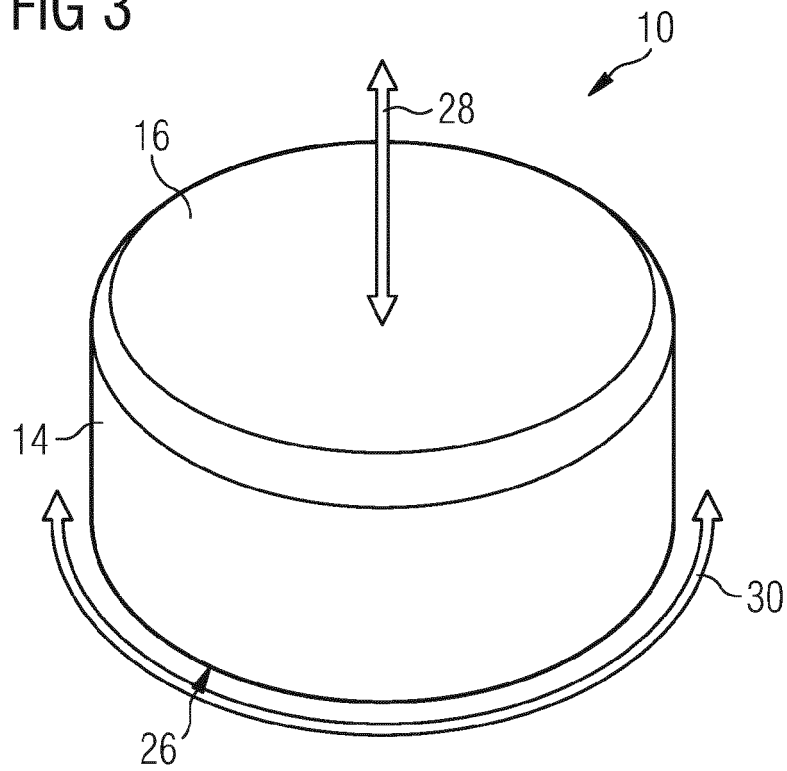


FIG 4

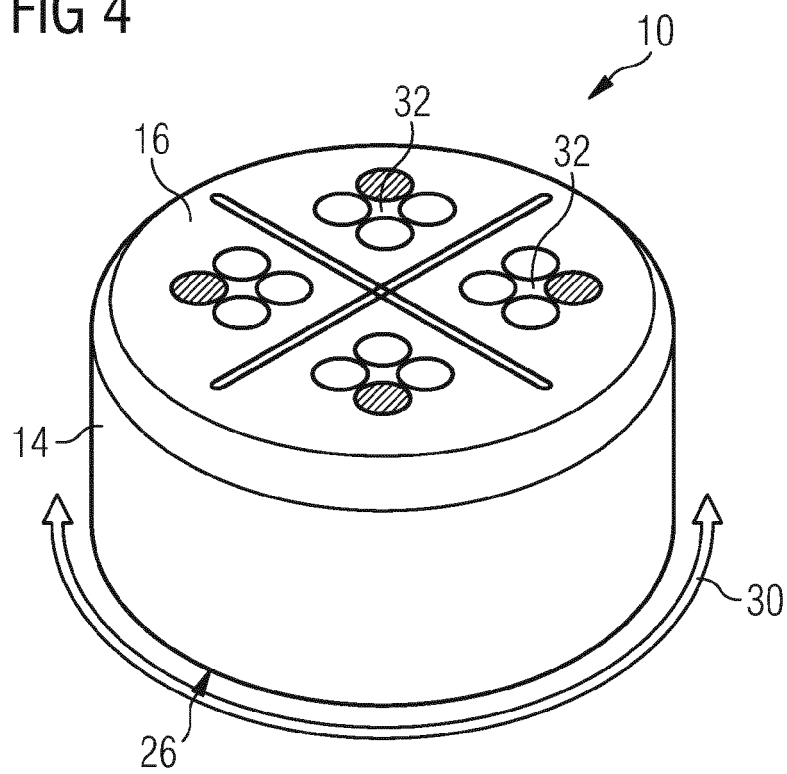


FIG 5

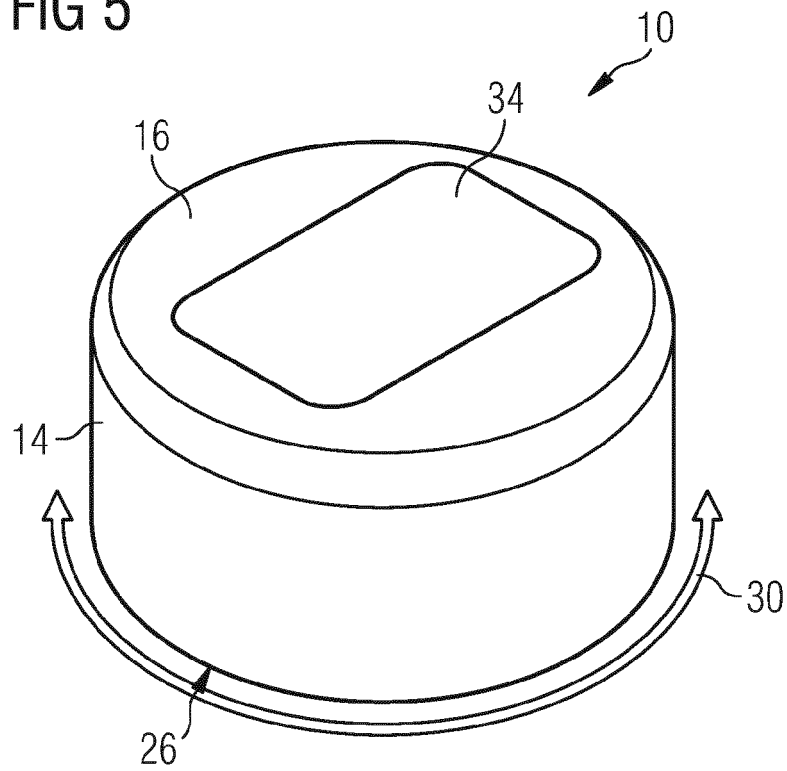


FIG 6

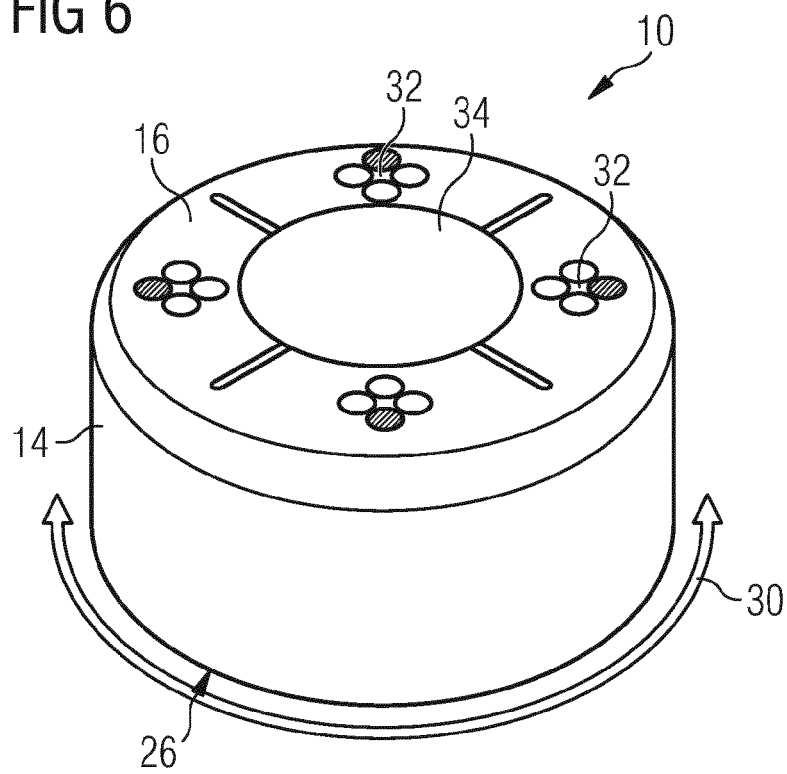
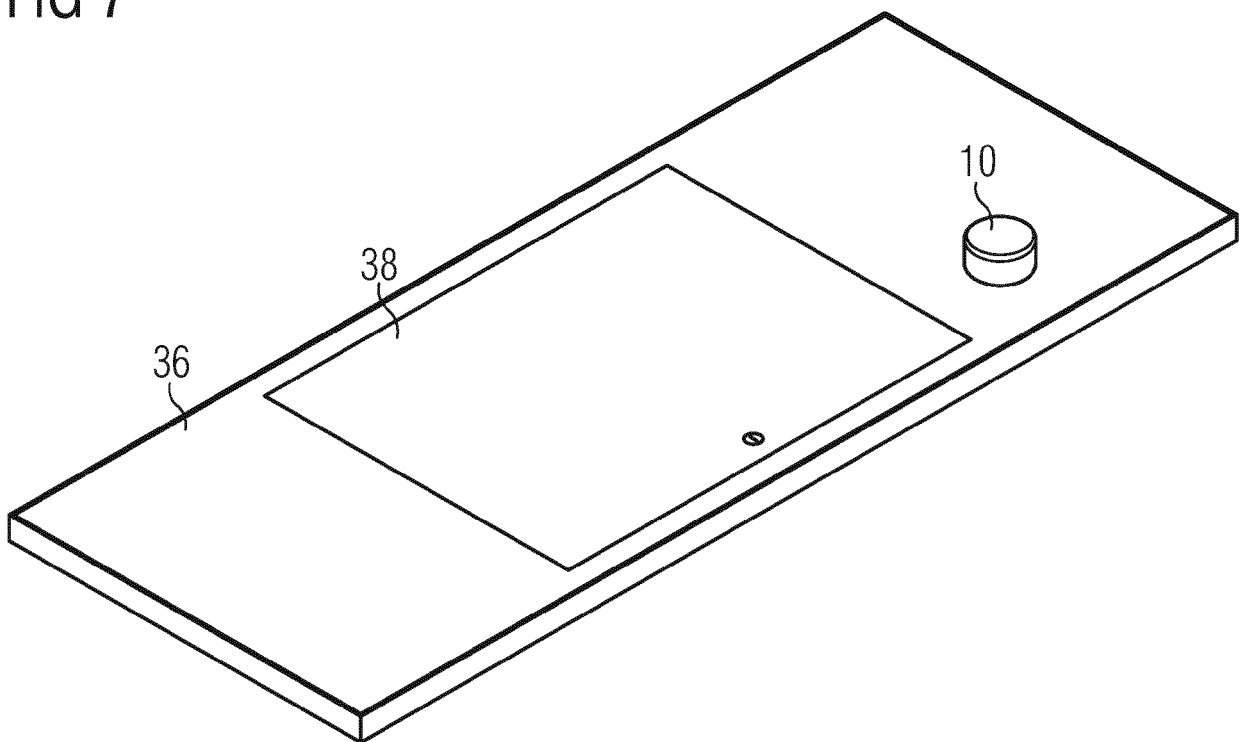


FIG 7





## EUROPEAN SEARCH REPORT

 Application Number  
 EP 17 16 3190

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                  |                                                           |                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                                                    | Relevant to claim                                         | CLASSIFICATION OF THE APPLICATION (IPC) |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2012/162073 A1 (KRYZE DAVID [US] ET AL)<br>28 June 2012 (2012-06-28)<br>* paragraph [0051] *<br>* paragraph [0053] - paragraph [0060] *<br>* paragraph [0101] - paragraph [0102] *            | 1-5,7,<br>10-15                                           | INV.<br>G08C17/00                       |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                  |                                                           | TECHNICAL FIELDS<br>SEARCHED (IPC)      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                  |                                                           | G08C                                    |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                  |                                                           |                                         |
| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                  | Date of completion of the search<br><b>31 August 2017</b> | Examiner<br><b>Pham, Phong</b>          |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                                                                  |                                                           |                                         |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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31-08-2017

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