(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 336 436 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.06.2018 Bulletin 2018/25

(51) Int Cl.:
F24C 7/08 *(2006.01)* ***F24C 3/12*** *(2006.01)*
F24C 5/16 *(2006.01)*

(21) Application number: **16204980.3**

(22) Date of filing: **19.12.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Electrolux Appliances Aktiebolag**
105 45 Stockholm (SE)

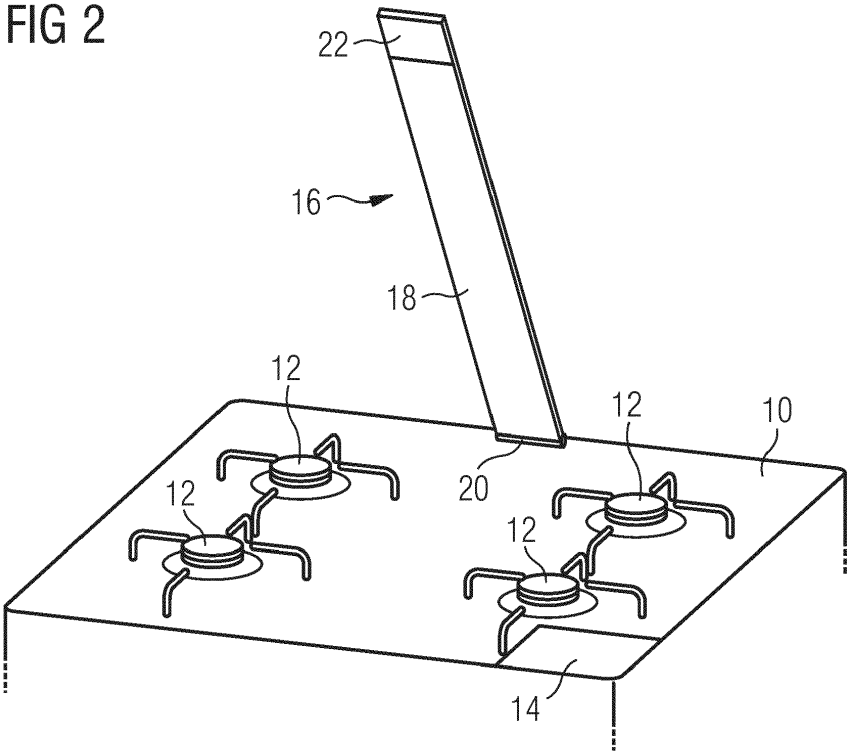
(72) Inventor: **KAISER, Kersten**
91541 Rothenburg ob der Tauber (DE)

(74) Representative: **Electrolux Group Patents**
AB Electrolux
Group Patents
105 45 Stockholm (SE)

(54) **COOKING HOB WITH A MONITORING DEVICE**

(57) The present invention relates to a cooking hob (10) comprising at least one monitoring device (16). The cooking hob (10) includes at least one cooking zone (12; 28). The monitoring device (16) is connected to the cooking hob (10) via at least one wired and/or wireless electrical signal connection. The monitoring device (16) includes at least one sensor system (22). The monitoring device (16) includes at least one elongated carrier (18; 24) for supporting the sensor system (22). The carrier (18; 24) is moveable between a non-operating state and an operating state of the monitoring device (16). The sensor system (22) is directed from above to at least one cooking zone (12; 28) in the operating state of the monitoring device (16).

FIG 2



EP 3 336 436 A1

Description

[0001] The present invention relates to a cooking hob comprising at least one monitoring device.

[0002] Monitoring devices are sometimes used for cooking hobs in order to watch the cooking process on said cooking hob. Usually, the monitoring devices are arranged separately above the cooking hob. For example, the monitoring device is attached at a bottom side of the exhaust hood, wherein said exhaust hood is arranged above the cooking hob.

[0003] It is an object of the present invention to provide a cooking hob with a monitoring device, wherein said cooking hob is realised by low complexity.

[0004] The object is achieved by the cooking hob comprising at least one monitoring device according to claim 1.

[0005] According to the present invention a cooking hob comprising at least one monitoring device is provided, wherein:

- the cooking hob includes at least one cooking zone,
- the monitoring device is connected to the cooking hob via at least one wired and/or wireless electrical signal connection,
- the monitoring device includes at least one sensor system,
- the monitoring device includes at least one elongated carrier for supporting the sensor system,
- the carrier is moveable between a non-operating state and an operating state of the monitoring device, and
- the sensor system is directed from above to at least one cooking zone in the operating state of the monitoring device.

[0006] The core of the present invention is that the monitoring device and the cooking hob are mechanically and/or electrically connected to each other and form a compact unit, wherein the sensor system is directed from above to the cooking zone. The elongated carrier supports the sensor system and allows a sufficient distance between the cooking zone and said sensor system. The sensor system is provided for monitoring the cooking process from above.

[0007] In particular, the sensor system includes at least one camera, at least one infrared sensor and/or at least one infrared sensor array.

[0008] Preferably, the sensor system is arranged above the cooking hob in the operating state of the monitoring device.

[0009] Furthermore, the sensor system may be arranged above the centre of the cooking hob in the operating state of the monitoring device.

[0010] Moreover, the sensor system may be arranged at a distant end portion of the carrier relating to the cooking hob in the operating state of the monitoring device.

[0011] For example, the carrier is moveable by a motor and/or manually by a user.

[0012] According to one embodiment of the present invention, the monitoring device includes at least one pivot arm and at least one hinge, wherein said pivot arm acts as the carrier for supporting the sensor system, and wherein the hinge is interconnected between the pivot arm and the cooking hob, and wherein the pivot arm is pivoting between the non-operating state and the operating state of the monitoring device.

[0013] Furthermore, the pivot arm may be moveable manually and/or by a spring element, wherein preferably the pivot arm is moveable from the non-operating state to the operating state by the spring element and from the operating state to the non-operating state manually by the user.

[0014] According to another embodiment of the present invention, the monitoring device includes at least one column, wherein said column acts as the carrier for supporting the sensor system, and wherein the column is counter-sunk within the cooking hob in the non-operating state of the monitoring device, and wherein the column extends vertically or inclined above the cooking hob in the operating state of the monitoring device.

[0015] In particular, the column is formed as a telescopic bar.

[0016] For example, the sensor system is provided for detecting the temperature upon the cooking zones.

[0017] Further, the sensor system may be provided for detecting the presence, the placement and/or the size of cookware on the cooking hob.

[0018] Moreover, the sensor system may be provided for detecting the type, the size and/or the colour of food stuff on the cooking hob.

[0019] Additionally, the sensor system may be provided for detecting a change of the colour of the food stuff upon the cooking hob. Furthermore, the sensor system may be provided for detecting a movement of the cookware and/or food stuff on the cooking hob.

[0020] At last, the cooking hob may include at least one user interface, wherein the sensor system is directed onto said user interface in the operating state of the monitoring device, and wherein preferably the sensor system is provided for detecting at least one finger of user on the user interface in order to recognise an operation on said user interface.

[0021] The cooking hob can especially be a gas cooking hob and/or an electrical cooking hob, in particular an induction cooking hob.

[0022] Especially, the cooking hob or cooking zones of the cooking hob can be bridged. Especially two or more cooking zones can be connected to a single cooking zone.

[0023] Novel and inventive features of the present invention are set forth in the appended claims.

[0024] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic perspective view of a

cooking hob with a monitoring device according to a first embodiment of the present invention, wherein the monitoring device is in a non-operating state,

FIG 2 illustrates a schematic perspective view of the cooking hob with the monitoring device according to the first embodiment of the present invention, wherein the monitoring device is in an operating state,

FIG 3 illustrates a schematic perspective view of the cooking hob with the monitoring device according to a second embodiment of the present invention, wherein the monitoring device is in the non-operating state,

FIG 4 illustrates a schematic perspective view of the cooking hob with the monitoring device according to the second embodiment of the present invention, wherein the monitoring device is in the operating state,

FIG 5 illustrates a schematic perspective view of the cooking hob with the monitoring device according to a third embodiment of the present invention, wherein the monitoring device is in the non-operating state,

FIG 6 illustrates a schematic perspective view of the cooking hob with the monitoring device according to the third embodiment of the present invention, wherein the monitoring device is in the operating state,

FIG 7 illustrates a schematic perspective view of the cooking hob with the monitoring device according to a fourth embodiment of the present invention, wherein the monitoring device is in the non-operating state, and

FIG 8 illustrates a schematic perspective view of the cooking hob with the monitoring device according to the fourth embodiment of the present invention, wherein the monitoring device is in the operating state.

[0025] FIG 1 illustrates a schematic perspective view of a cooking hob 10 with a monitoring device 16 according to a first embodiment of the present invention, wherein the monitoring device 16 is in a non-operating state.

[0026] The cooking hob 10 includes four gas burners 12 and a user interface 14. In general, the cooking hob 10 may include one or more gas burners 12. In this example, the four gas burners 12 are arranged as a two-by-two matrix. Generally, the cooking hob 10 may include arbitrary arrangements of gas burners 12.

[0027] The monitoring device 16 includes a pivot arm 18 and a hinge 20. The hinge 20 connects the pivot arm 18 to the cooking hob 10. In this example, the hinge is arranged in a central portion of the rear side of the cooking hob 10. In the non-operating state, the elongated pivot arm 18 extends horizontally upon the cooking hob 10. In this example, the pivot arm 18 extends from the hinge 20 forwards to the front side of the cooking hob 10. In the non-operating state, the monitoring device 16 is arranged flatly on or beside the cooking hob 10. In this example, the pivot arm 18 is arranged between the gas burners 12.

[0028] Further, the monitoring device 16 includes an on-off switch 26. For example, the on-off switch 26 is arranged at the pivot arm 18. Alternatively or additionally, the on-off switch 26 may be arranged on the user interface 14. In this example, the on-off switch 26 is arranged in an end portion of the pivot arm 18, which is opposite to the hinge 20. In general, the on-off switch 26 may be arranged in an arbitrary position of the cooking hob 10 or the monitoring device 16. The on-off switch 26 is provided for switching between the non-operating state and an operating state of the monitoring device 16.

[0029] FIG 2 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to the first embodiment of the present invention, wherein the monitoring device 16 is in an operating state.

[0030] In the operating state, the pivot arm 18 of the monitoring device 16 extends from the hinge 20 upwards. For example, the pivot arm 18 is moveable by a motor between the operating state and the non-operating state. In this case, the on-off switch 26 may be provided for activating and deactivating the monitoring device 16. Further, the pivot arm 18 may be manually moveable between the operating state and the non-operating state. Moreover, the pivot arm 18 may be semi-manually moveable by a spring-element between the operating state and the non-operating state.

[0031] In this example, the pivot arm 18 is inclined. The upper end of the pivot arm 18 is arranged above the centre of the cooking hob 10. The monitoring device 16 comprises a sensor system 22 arranged at the upper end of the pivot arm 18. The sensor system 22 includes at least one camera and/or at least one infrared sensor. For example, the sensor system 22 may include an array of infrared sensors. The camera and/or the infrared sensor are directed onto the gas burners 12. Further, the camera and/or the infrared sensor may be directed onto one or more elected gas burners 12. Moreover, the camera and/or the infrared sensor may be directed onto the user interface 14. The sensor system 22 allows monitoring the cooking hob 10 from the top side.

[0032] The sensor system 22 may be provided for determining the placement of the cookware, the size of the cookware and/or the use of a lid on said cookware. Further, the sensor system 22 may detect the presence of the cookware on the gas burner 12, boilover and/or if the cookware runs dry. Thus, the sensor system 22 increases the safety of the cooking process. Moreover, the sen-

sor system 22 may detect the temperature of the food stuff and/or the cookware, the size of the food stuff and/or a change of the colour of the food stuff. Due to the change of the colour of the food stuff or due to the temperature detection the sensor system 22 may recognise if the food stuff is ready. The sensor system 22 is able to recognise a movement of the cookware by the user or the turn of a pan cake.

[0033] Furthermore, the sensor system 22 may be used as an input system. The detection of the user's hand or finger in a predetermined position by the sensor system 22 may be interpreted as the touch of a corresponding switch. For example, the sensor system 22 may detect the presence of the user's hand or finger on the user interface 14. By this way, the sensor system 22 provides the input system of the cooking hob 10.

[0034] FIG 3 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to a second embodiment of the present invention, wherein the monitoring device 16 is in a non-operating state.

[0035] The cooking hob 10 includes the four gas burners 12 and the user interface 14, wherein the cooking hob 10 may generally include one or more gas burners 12. In this example, the gas burners 12 are arranged as the two-by-two matrix.

[0036] The monitoring device 16 is arranged in the rear corner on the right hand side of the cooking hob 10. In the non-operating state the monitoring device 16 is counter-sunk within the cooking hob 10.

[0037] Further, the monitoring device 16 may include an on-off switch, which is not shown. For example, the on-off switch 26 may be arranged on the user interface 14. The on-off switch 26 is provided for switching between the non-operating state and the operating state of the monitoring device 16. In general, the on-off switch 26 may be arranged in an arbitrary position of the cooking hob 10 or the monitoring device 16. Alternatively or additionally, the operating state and the non-operating state of the monitoring device 16 may be automatically activated and deactivated.

[0038] FIG 4 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to the second embodiment of the present invention, wherein the monitoring device 16 is in an operating state.

[0039] The monitoring device 16 of the second embodiment includes a column 24. Said column 24 is concealed within the cooking hob 10 in the non-operating state of the monitoring device 16. In the operating state of the monitoring device 16 the column 24 is arranged above the cooking hob 10. In this example, the column 24 extends vertically above the cooking hob 10. Alternatively, the column 24 may be inclined above the cooking hob 10. Optionally, the column 24 may be pivoting. For example, the column 24 may be formed as a telescopic bar. According to one embodiment, the column 24 is moveable by a motor between the non-operating state and the operating state. In this case, the on-off switch 26 may be provided for activating and deactivating the monitoring device 16. According to another embodiment, the column 24 is semi-manually moveable by a spring-element between the non-operating state and the operating state and manually moveable between the operating state and the non-operating state.

[0040] In the second embodiment, the sensor system 22 is arranged at the upper end portion of the column 24. The sensor system 22 includes at least one camera and/or at least one infrared sensor. Moreover, the sensor system 22 may include an array of infrared sensors. The camera and/or the infrared sensor are directed onto the gas burners 12. Further, the camera and/or the infrared sensor may be directed onto one or more elected gas burners 12. The sensor system 22 allows monitoring the cooking hob 10 from the top side. Additionally, the camera and/or the infrared sensor may be directed onto the user interface 14. The sensor system 22 allows monitoring the cooking hob 10 from the top side.

[0041] For example, the sensor system 22 may be provided for determining the presence and/or position of the cookware, the size of the cookware and/or the use and/or position of a lid on said cookware. Further, the sensor system 22 may detect boilover, the presence of the cookware on the gas burner 12 and/or if the cookware runs dry. In this way, the sensor system 22 increases the safety of the cooking process. Moreover, the sensor system 22 may detect the temperature of the food stuff and/or the cookware, the size of the food stuff and/or a change of the colour of the food stuff. The detection of the temperature allows an automatic or semi-automatic control of the cooking process. The sensor system 22 may recognise, if the food stuff is ready or has to be turned, due to the change of the colour of the food stuff. The sensor system 22 is able to recognise a movement of the cookware by the user or the turn of a pan cake.

[0042] Moreover, the sensor system 22 may be used as an input system. The detection of the user's hand or finger in a predetermined position by the sensor system 22 may be interpreted as the touch of a corresponding switch. For example, the sensor system 22 may detect the presence of the user's hand or finger on the user interface 14. By this way, the sensor system 22 provides the input system of the cooking hob 10.

[0043] FIG 5 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to a third embodiment of the present invention, wherein the monitoring device 16 is in the non-operating state.

[0044] The cooking hob can be an electrical cooking hob, especially an induction cooking hob.

[0045] The cooking hob 10 includes four cooking zones 28 and the user interface 14. In general, the cooking hob 10 may include an arbitrary number of cooking zones 28, which especially can at least partially be bridged and/or connected to at least one cooking zone. In this example, the cooking zones 28 and the user interface 14 are cov-

ered by a glass ceramic panel. The four cooking zones 28 are arranged as a two-by-two matrix, wherein, especially two or four cooking zones can be bridged to one or two larger cooking zones. Generally, the cooking hob 10 may include an arbitrary arrangement of cooking zones 28. For example, the cooking zones 28 may include radiant heating elements and/or induction coils. Further, the cooking zones 28 may include one or more gas burners arranged beneath the glass ceramic panel. Moreover, the cooking zones 28 may include different heating systems.

[0046] The monitoring device 16 includes the pivot arm 18 and the hinge 20. The hinge 20 connects the pivot arm 18 to the cooking hob 10. In this example, the hinge is arranged in the central portion of the rear side of the cooking hob 10. In the non-operating state, the elongated pivot arm 18 extends horizontally upon the cooking hob 10. In this example, the pivot arm 18 extends from the hinge 20 forwards to the front side of the cooking hob 10. In the non-operating state, the monitoring device 16 is arranged flatly on or beside the cooking hob 10. In this example, the pivot arm 18 is arranged between the cooking zones 28.

[0047] Further, the monitoring device 16 includes the on-off switch 26. For example, the on-off switch 26 is arranged at the pivot arm 18. Alternatively or additionally, the on-off switch 26 may be arranged on the user interface 14. In this example, the on-off switch 26 is arranged in the end portion of the pivot arm 18, which is opposite to the hinge 20. In general, the on-off switch 26 may be arranged in an arbitrary position of the cooking hob 10 or the monitoring device 16. The on-off switch 26 is provided for switching between the non-operating state and the operating state of the monitoring device 16.

[0048] FIG 6 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to the third embodiment of the present invention, wherein the monitoring device 16 is in the operating state.

[0049] In the operating state, the pivot arm 18 of the monitoring device 16 extends from the hinge 20 upwards. For example, the pivot arm 18 is moveable by the motor between the operating state and the non-operating state. In this case, the on-off switch 26 may be provided for activating and deactivating the monitoring device 16. Further, the pivot arm 18 may be manually moveable between the operating state and the non-operating state. Moreover, the pivot arm 18 may be semi-manually moveable by the spring-element between the operating state and the non-operating state.

[0050] In this example, the pivot arm 18 is inclined. The upper end of the pivot arm 18 is arranged above the centre of the cooking hob 10. The monitoring device 16 comprises the sensor system 22 arranged at the upper end of the pivot arm 18. The sensor system 22 includes at least one camera and/or at least one infrared sensor. For example, the sensor system 22 may include the array of infrared sensors. The camera and/or the infrared sensor are directed onto the cooking zones 28. Further, the camera and/or the infrared sensor may be directed onto one or more elected cooking zones 28. Moreover, the camera and/or the infrared sensor may be directed onto the user interface 14. The sensor system 22 allows monitoring the cooking hob 10 from the top side.

[0051] The sensor system 22 may be provided for determining the placement of the cookware, the size of the cookware and/or the use of the lid on said cookware. Further, the sensor system 22 may detect the presence of the cookware on the cooking zone 28, boilover and/or if the cookware runs dry. Thus, the sensor system 22 increases the safety of the cooking process. Moreover, the sensor system 22 may detect the temperature of the food stuff and/or the cookware, the size of the food stuff and/or the change of the colour of the food stuff. Due to the change of the colour of the food stuff or due to the temperature detection the sensor system 22 may recognise if the food stuff is ready. The sensor system 22 is able to recognise the movement of the cookware by the user or the turn of the pan cake.

[0052] Furthermore, the sensor system 22 may be used as input system. The detection of the user's hand or finger in the predetermined position by the sensor system 22 may be interpreted as the touch of the corresponding switch. For example, the sensor system 22 may detect the presence of the user's hand or finger on the user interface 14. By this way, the sensor system 22 provides the input system of the cooking hob 10.

[0053] FIG 7 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to a fourth embodiment of the present invention, wherein the monitoring device 16 is in the non-operating state. The cooking hob can be an electrical cooking hob, especially an induction cooking hob.

[0054] The cooking hob 10 includes the four cooking zones 28 and the user interface 14, wherein the cooking hob 10 may generally include one or more cooking zones 28, which especially can at least partially be bridged. The cooking zones 28 and the user interface 14 are covered by the glass ceramic panel. In this example, the cooking zones 28 are arranged as the two-by-two matrix, wherein, especially two or four cooking zones can be bridged to one or two larger cooking zones. For example, the cooking zones 28 may be formed by radiant heating elements or induction coils. Moreover, the cooking zones 28 may include one or more gas burners arranged beneath the glass ceramic panel.

[0055] The monitoring device 16 is arranged in the rear corner on the right hand side of the cooking hob 10. In the non-operating state the monitoring device 16 is counter-sunk within the cooking hob 10.

[0056] Further, the monitoring device 16 may include the on-off switch, which is not shown. For example, the on-off switch 26 may be arranged on the user interface 14. The on-off switch 26 is provided for switching between the non-operating state and the operating state of the monitoring device 16. In general, the on-off switch 26 may be arranged in an arbitrary position of the cooking

hob 10 or the monitoring device 16. Alternatively or additionally, the operating state and the non-operating state of the monitoring device 16 may be automatically activated and deactivated.

[0057] FIG 8 illustrates a schematic perspective view of the cooking hob 10 with the monitoring device 16 according to the fourth embodiment of the present invention, wherein the monitoring device 16 is in the operating state.

[0058] The monitoring device 16 of the fourth embodiment includes the column 24. Said column 24 is concealed within the cooking hob 10 in the non-operating state of the monitoring device 16. In the operating state of the monitoring device 16 the column 24 is arranged above the cooking hob 10. In this example, the column 24 extends vertically above the cooking hob 10. Alternatively, the column 24 may be inclined above the cooking hob 10. Optionally, the column 24 may be pivoting. For example, the column 24 may be formed as telescopic bar. According to one embodiment, the column 24 is moveable by the motor between the non-operating state and the operating state. In this case, the on-off switch 26 may be provided for activating and deactivating the monitoring device 16. According to another embodiment, the column 24 is semi-manually moveable by the spring-element between the non-operating state and the operating state and manually moveable between the operating state and the non-operating state.

[0059] In the second embodiment, the sensor system 22 is arranged at the upper end portion of the column 24. The sensor system 22 includes the at least one camera and/or the at least one infrared sensor. Moreover, the sensor system 22 may include the array of infrared sensors. The camera and/or the infrared sensor are directed onto the cooking zones 28. Further, the camera and/or the infrared sensor may be directed onto the one or more elected cooking zones 28. The sensor system 22 allows monitoring the cooking hob 10 from the top side. Additionally, the camera and/or the infrared sensor may be directed onto the user interface 14. The sensor system 22 allows monitoring the cooking hob 10 from the top side.

[0060] For example, the sensor system 22 may be provided for determining the presence and/or position of the cookware, the size of the cookware and/or the use and/or position of the lid on said cookware. Further, the sensor system 22 may detect boilover, the presence of the cookware on the cooking zone 28 and/or if the cookware runs dry. In this way, the sensor system 22 increases the safety of the cooking process. Moreover, the sensor system 22 may detect the temperature of the food stuff and/or the cookware, the size of the food stuff and/or the change of the colour of the food stuff. The detection of the temperature allows an automatic or semi-automatic control of the cooking process. The sensor system 22 may recognise, if the food stuff is ready or has to be turned, due to the change of the colour of the food stuff. The sensor system 22 is able to recognise a movement of the cookware by the user or the turn of the pan cake.

[0061] Moreover, the sensor system 22 may be used as input system. The detection of the user's hand or finger in the predetermined position by the sensor system 22 may be interpreted as the touch of a corresponding switch. For example, the sensor system 22 may detect the presence of the user's hand or finger on the user interface 14. By this way, the sensor system 22 provides the input system of the cooking hob 10.

[0062] The cooking hobs 10 according to the first and third embodiments may be combined. The resulting cooking hob 10 comprises a portion with one or more gas burners 12 and a further portion with one or more cooking zones 28, wherein said further portion is covered by the glass ceramic panel. For example, the different portions of the cooking hob 10 may be arranged side-by-side, wherein preferably the monitoring device 16 is arranged between said different portions.

[0063] In a similar way, the cooking hobs 10 according to the second and fourth embodiments may be combined. The resulting cooking hob 10 comprises the portion with one or more gas burners 12 and the further portion with one or more cooking zones 28, wherein said further portion is covered by the glass ceramic panel. For example, the different portions of the cooking hob 10 may be arranged side-by-side.

[0064] The monitoring device 16 according to the present invention is suitable for arbitrary kinds of cooking hobs 10. The cooking hobs 10 may comprise different kinds of heating elements, e.g. induction coils, radiant heating elements, gas burners. The gas burners may include open flames and/or flames covered by a transparent or semi-transparent panel, e.g. glass ceramic panel.

[0065] Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to those precise embodiments, 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

[0066]

10	cooking hob
12	gas burner
14	use interface
16	monitoring device
18	pivot arm
20	hinge
22	sensor system
24	column
26	on-off switch
28	cooking zone

Claims

1. A cooking hob (10) comprising at least one monitoring device (16), wherein:

   - the cooking hob (10) includes at least one cooking zone (12; 28),
   - the monitoring device (16) is connected to the cooking hob (10) via at least one wired and/or wireless electrical signal connection,
   - the monitoring device (16) includes at least one sensor system (22),
   - the monitoring device (16) includes at least one elongated carrier (18; 24) for supporting the sensor system (22),
   - the carrier (18; 24) is moveable between a non-operating state and an operating state of the monitoring device (16), and
   - the sensor system (22) is directed from above to at least one cooking zone (12; 28) in the operating state of the monitoring device (16).

2. The cooking hob according to claim 1, **characterised in that** the sensor system (22) includes at least one camera, at least one infrared sensor and/or at least one infrared sensor array.

3. The cooking hob according to claim 1 or 2, **characterised in that** the sensor system (22) is arranged above the cooking hob (10) in the operating state of the monitoring device (16), wherein preferably the sensor system (22) is arranged above the centre of the cooking hob (10) in the operating state of the monitoring device (16).

4. The cooking hob according to any one of the preceding claims, **characterised in that** the sensor system (22) is arranged at a distant end portion of the carrier (18; 24) relating to the cooking hob (10) in the operating state of the monitoring device (16).

5. The cooking hob according to any one of the preceding claims, **characterised in that** the carrier (18; 24) is moveable by a motor and/or manually by a user.

6. The cooking hob according to any one of the preceding claims, **characterised in that** the monitoring device (16) includes at least one pivot arm (18) and at least one hinge (20), wherein said pivot arm (18) acts as the carrier (18) for supporting the sensor system (22), and wherein the hinge (20) is interconnected between the pivot arm (18) and the cooking hob (10), and wherein the pivot arm (18) is pivoting between the non-operating state and the operating state of the monitoring device (16) .

7. The cooking hob according to claim 6, **characterised in that** the pivot arm (18) is moveable manually and/or by a spring element, wherein preferably the pivot arm (18) is moveable from the non-operating state to the operating state by the spring element and from the operating state to the non-operating state manually by the user.

8. The cooking hob according to any one of the claims 1 to 5, **characterised in that** the monitoring device (16) includes at least one column (24), wherein said column (24) acts as the carrier (24) for supporting the sensor system (22), and wherein the column (24) is counter-sunk within the cooking hob (10) in the non-operating state of the monitoring device (16), and wherein the column (24) extends vertically or inclined above the cooking hob (10) in the operating state of the monitoring device (16).

9. The cooking hob according to claim 8, **characterised in that** the column (24) is formed as a telescopic bar.

10. The cooking hob according to any one of the preceding claims, **characterised in that** the sensor system (22) is provided for detecting the temperature upon the cooking zones (12; 28).

11. The cooking hob according to any one of the preceding claims, **characterised in that** the sensor system (22) is provided for detecting the presence, the placement and/or the size of cookware on the cooking hob (10).

12. The cooking hob according to any one of the preceding claims, **characterised in that** the sensor system (22) is provided for detecting the type, the size and/or the colour of food stuff on the cooking hob (10) .

13. The cooking hob according to any one of the preceding claims, **characterised in that** the sensor system (22) is provided for detecting a change of the colour of the food stuff upon the cooking hob (10).

14. The cooking hob according to any one of the pre-

ceding claims,
characterised in that
the sensor system (22) is provided for detecting a movement of the cookware and/or food stuff on the cooking hob (10).

15. The cooking hob according to any one of the preceding claims,
characterised in that
the cooking hob (10) includes at least one user interface (14), wherein the sensor system (22) is directed onto said user interface (14) in the operating state of the monitoring device (16), and wherein preferably the sensor system (22) is provided for detecting at least one finger of user on the user interface (14) in order to recognise an operation on said user interface (14).

16. The cooking hob according to any one of the preceding claims,
characterised in that
the cooking hob (10) is a gas cooking hob and/or an electrical cooking hob, especially an induction cooking hob and/or the cooking zones can be bridged, especially two or more cooking zones can be connected to a single cooking zone.

FIG 1

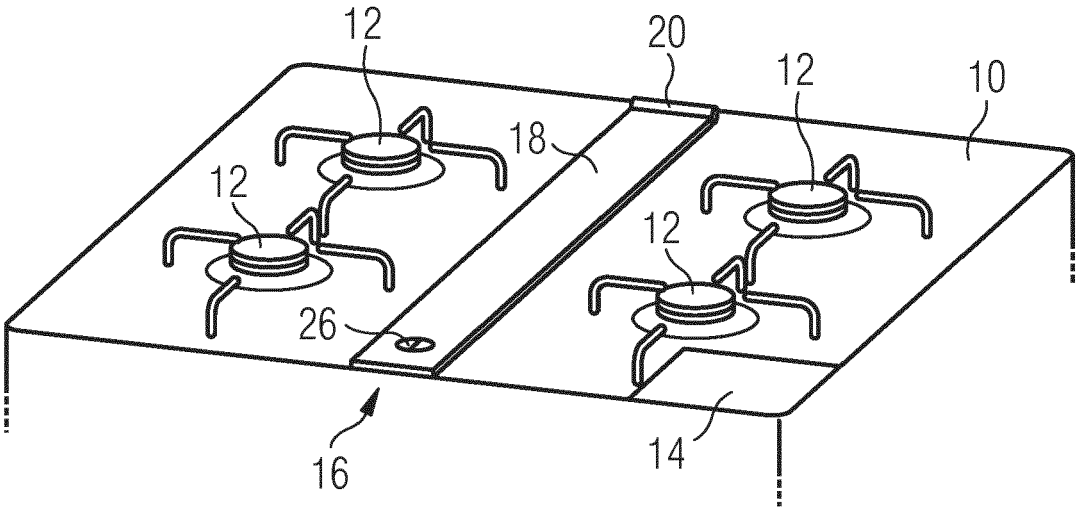


FIG 2

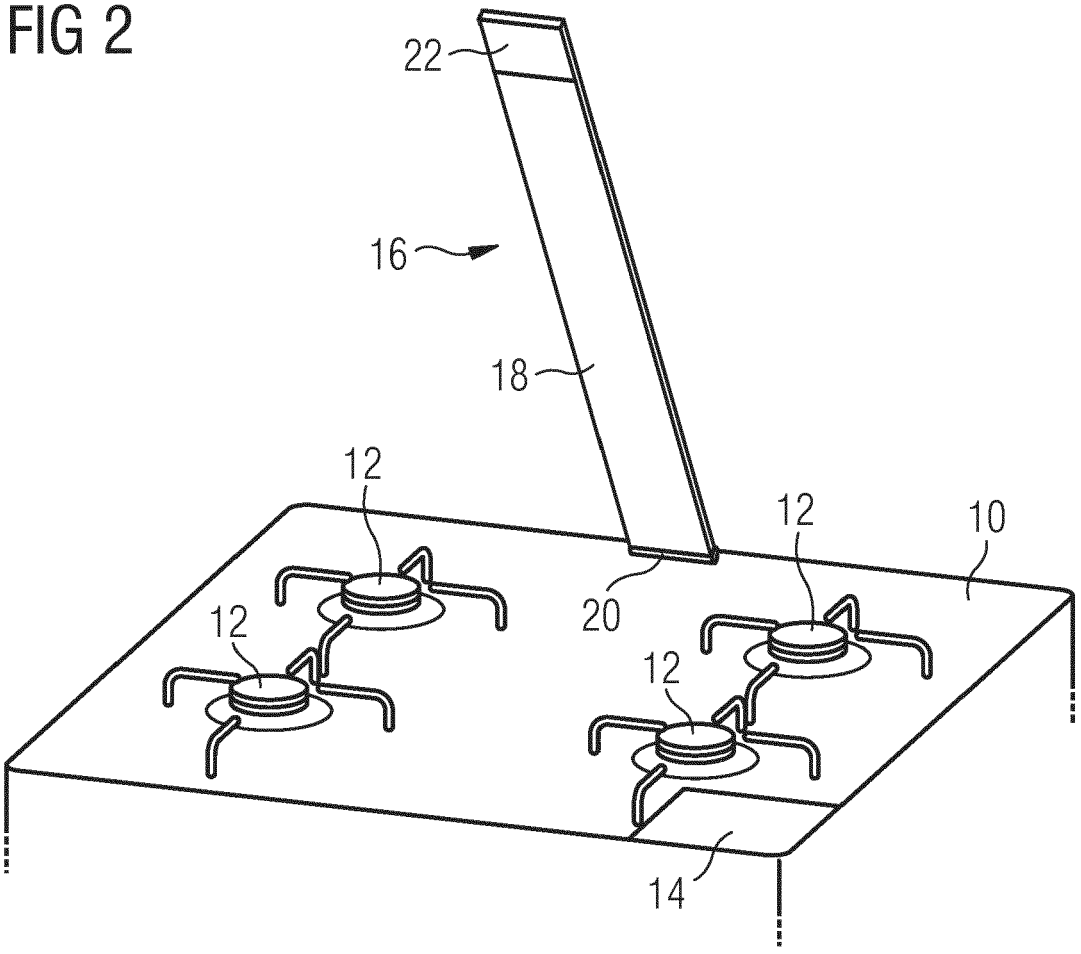


FIG 3

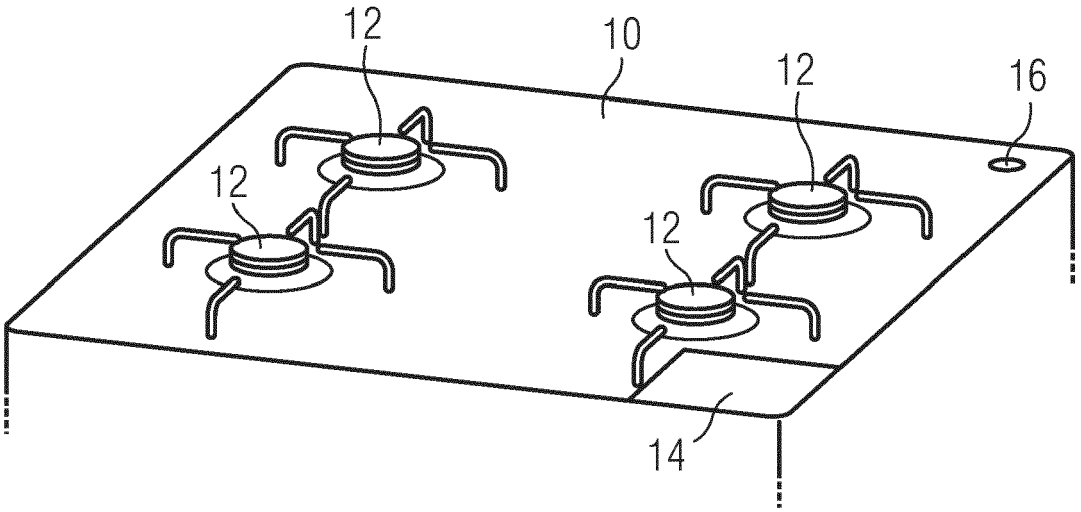


FIG 4

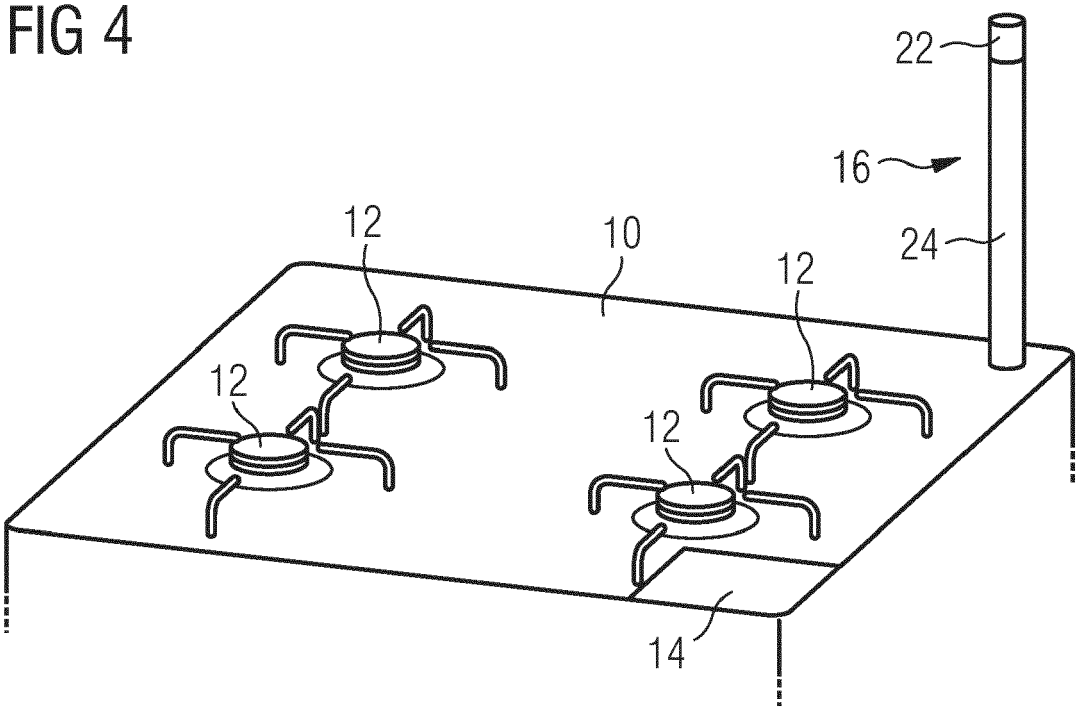


FIG 5

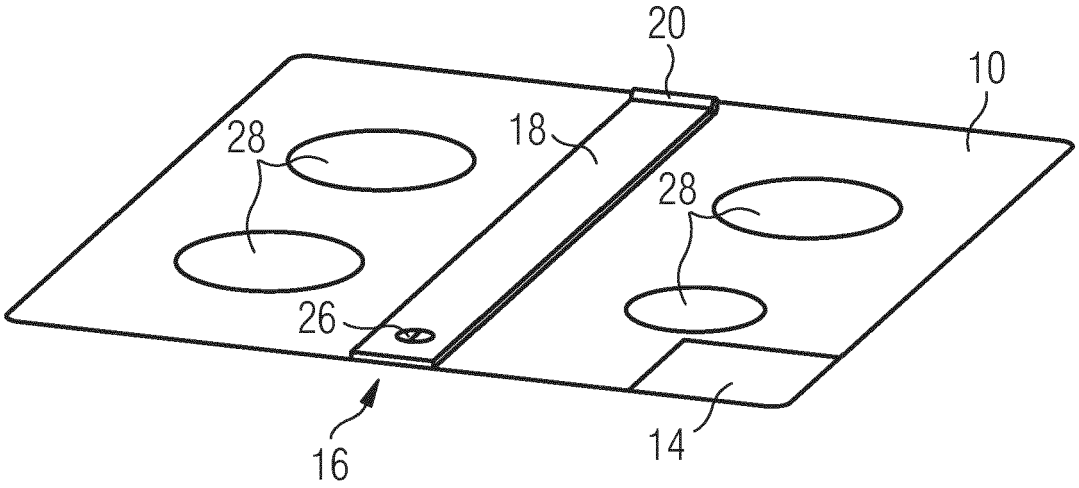


FIG 6

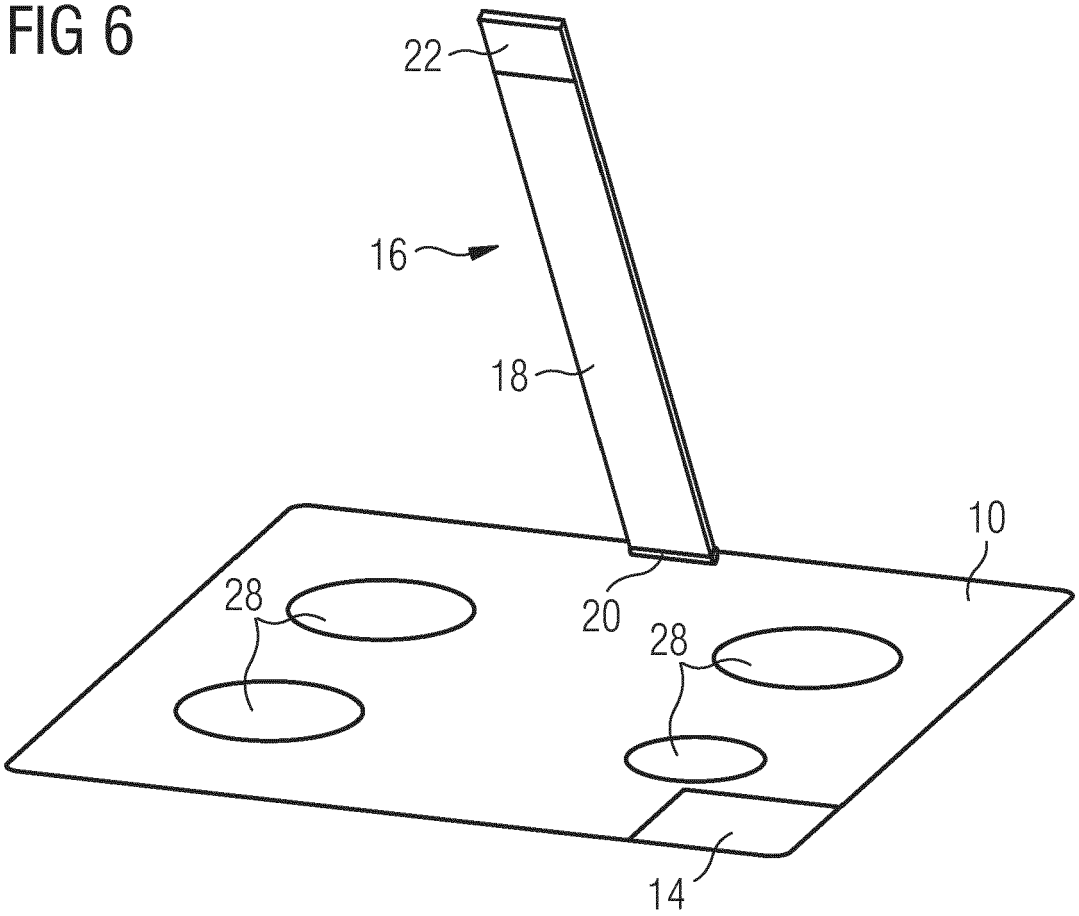


FIG 7

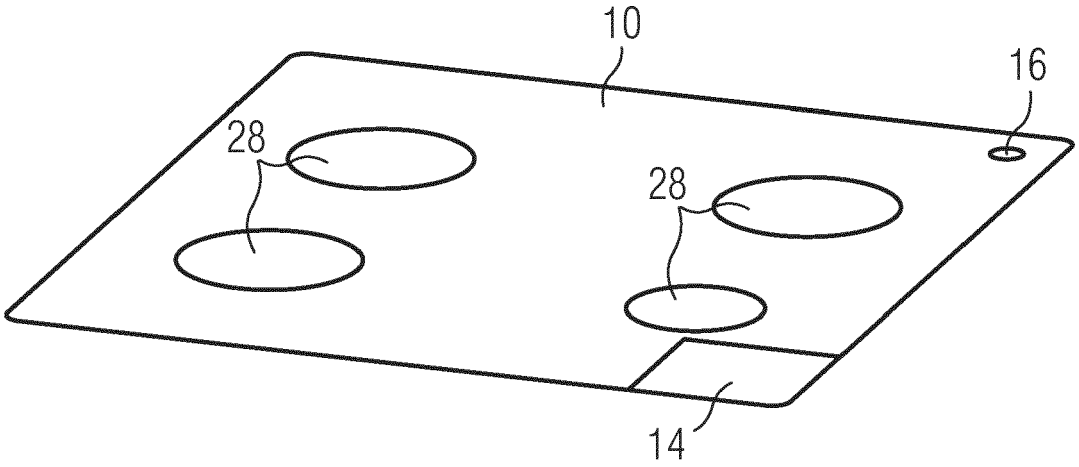
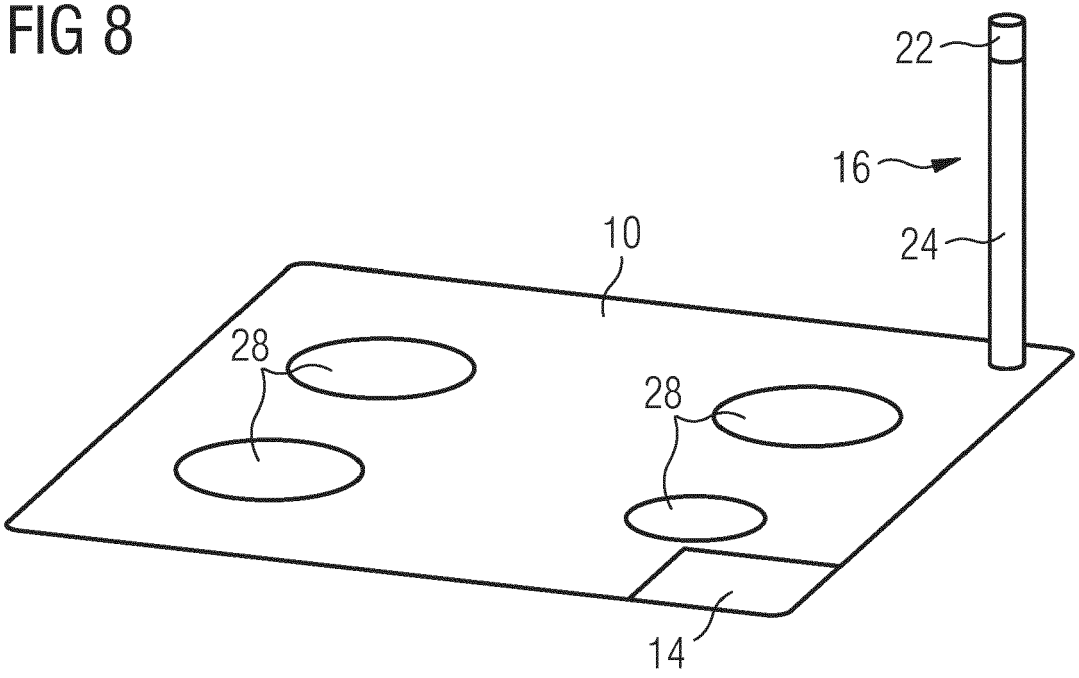


FIG 8



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 20 4980

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	DE 10 2010 039371 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 16 February 2012 (2012-02-16) * paragraphs [0050] - [0061]; figures 1-3 *	1-16	INV. F24C7/08 F24C3/12 F24C5/16
X	US 2009/159589 A1 (GRAETZ FRANZ [DE] ET AL) 25 June 2009 (2009-06-25) * figures 1,2 *	1	
X	EP 0 690 659 A2 (BOSCH SIEMENS HAUSGERAETE [DE]) 3 January 1996 (1996-01-03) * figures 1-7 *	1	
X	DE 10 2005 041574 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 27 April 2006 (2006-04-27) * figures 2,4,5 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 March 2017	Makúch, Milan

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 20 4980

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

08-03-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102010039371 A1	16-02-2012	NONE	
US 2009159589 A1	25-06-2009	DE 102006023702 A1	22-11-2007
		EP 2024686 A2	18-02-2009
		US 2009159589 A1	25-06-2009
		WO 2007134998 A2	29-11-2007
EP 0690659 A2	03-01-1996	EP 0690659 A2	03-01-1996
		ES 2170110 T3	01-08-2002
DE 102005041574 A1	27-04-2006	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82