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(54) **HOUSEHOLD COOKING APPLIANCE**

HAUSHALTSGARGERÄT

APPAREIL MENAGER POUR LA CUISSON

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Description

Field of the invention

[0001] The present invention relates to household cooking appliances, in particular appliances having a control panel.

State of the art

[0002] Some appliances of the type indicated have a stationary structure arranged within which is a muffle, defining a cooking chamber. Associated to the front of the structure is a front door, for access to the aforesaid cooking chamber, provided above which is a control panel, which includes a plurality of manual-control members, associated to respective electrical selectors, for selection of respective operating conditions of the appliance. The selectors each have a selector body, which is secured, at a first end, to the front of the stationary structure so as to be supported in cantilever fashion towards the inside of the structure itself. The respective manual-control members, which are generally constituted by rotary knobs, can instead be operated at an outer side of the front of the structure. Each selector has a respective part - usually represented by a control rod - that passes through a corresponding opening of the front of the structure, associated to which is the corresponding knob.

[0003] Appliances of this type also have a control system, comprising a main control board, which includes a circuit support, generally represented by a printed-circuit board. Associated to the circuit support are a plurality of electrical and/or electronic components, for control of the various functions of the cooking appliance. Electrically connected to the control board are, moreover, the aforesaid selectors.

[0004] In appliances according to the known art, the control board is in general secured above a channel that extends between the front of the appliance and a fan set behind, above the muffle that defines the cooking chamber. This channel is in general pre-arranged for bringing about cooling of the front door of the appliance and/or for expulsion of cooking fumes from the muffle. For this purpose, the front of the appliance has, above the front opening of the cooking chamber, a series of slits, behind which the channel extends. The control board is anchored on said channel, generally supported at a certain distance by the metal material that constitutes it. This type of assembly presupposes the use of purposely provided fixing brackets or casings, which entail corresponding assembly operations, amongst which the operations of connection - via electrical cables - of the electronic board to the selectors provided at the front of the appliance.

[0005] DE19539081 discloses a control module for an electric oven, comprising a knob with a hollow stem that mechanically couples with one or more electrical relays at the rear.

[0006] EP2687787 discloses a pop-up apparatus including a knob housing, suitable to be coupled to a rear surface of the front panel of an oven. US 4 431 907 A discloses a household cooking appliances having several control knobs, wherein the control knobs are fixed to one main control board.

Summary of the invention

[0007] In its general terms, the aim of the present invention is to provide a cooking appliance of the type indicated above, distinguished by the fixing of an electronic board thereof that is particularly advantageous from the standpoint of costs and manufacturing processes. The above and other aims still, which will emerge more clearly hereinafter, are achieved according to the present invention by a cooking appliance having the characteristics indicated in the annexed claims. The claims constitute an integral part of the technical teaching provided herein in relation to the invention.

Brief description of the drawings

[0008] Further objects, characteristics, and advantages of the invention will emerge clearly from the ensuing detailed description, with reference to the annexed drawings, which are provided purely by way of explanatory and non-limiting example and in which:

- Figure 1 is a schematic view in front elevation of a cooking appliance according to the invention;
- Figures 2 and 3 are schematic views in front and rear elevation, respectively, of a frame belonging to the structure of a cooking appliance according to the invention;
- Figure 4 is a partial perspective view of the rear side of the frame of Figures 2 and 3;
- Figure 5 is a schematic perspective view of a main control board belonging to a control system of a cooking appliance according to the invention;
- Figure 6 is a detail at a larger scale of Figure 5;
- Figure 7 is a detail at a larger scale of Figure 3; and
- Figures 8 and 9 are schematic cross-sectional views according to the lines VIII-VIII and IX-IX of Figure 2, respectively.

Description of embodiments of the invention

[0009] Reference to "an embodiment" or "one embodiment" in the framework of the present description is intended to indicate that a particular configuration, structure, or characteristic described in relation to the embodiment is comprised in at least one embodiment. Hence, phrases such as "in an embodiment" or "in one embodiment" and the like, that may be present in various points of the present description, do not necessarily all refer to

one and the same embodiment. Furthermore, the particular configurations, structures, or characteristics may be combined in any adequate way in one or more embodiments. The references used in what follows are provided merely for convenience and do not define the sphere of protection or the scope of the embodiments.

[0010] It is pointed out that in the sequel of the present description only the elements useful for an understanding of the invention will be described in particular detail, taking for granted that the appliance forming the subject of the invention comprises all the other elements in themselves known for normal operation of an ordinary electrical household cooking appliance, such as an oven or a kitchen range with built-in oven.

[0011] In Figure 1, designated as a whole by 1 is a household cooking appliance according to one embodiment of the invention, which in the example represented is a cooking oven. The oven 1 has a stationary load-bearing structure 2, in the front part of which a front door 3 is provided. The door may be built in any known way, and may for example comprise one or more panes of glass 3a associated to a respective frame, associated to which is a grip 3b.

[0012] Above the front door 3 the structure 2 of the oven has a control panel 4. The panel 4 comprises at least two manual-control members 5, here constituted by rotary knobs, which are associated to corresponding selectors, here rotary selectors, for selection of respective operating conditions of the appliance 1. In the case exemplified, moreover, the control panel 4 has a display device 6, set in an intermediate position with respect with respect to the knobs 5.

[0013] It is pointed out that by the term "selectors" is here meant any type of electrical and/or electronic control device aimed at enabling selection or regulation of an operating characteristic, mode, or quantity of the appliance among the various possible ones, such as, for example, the choice of an operating program or of a particular function, or again regulation of a physical quantity, such as for example a cooking temperature. In this perspective, for example, the selectors used in an appliance according to the invention may be constituted by rotary switching devices, provided with multiple contacts, or by potentiometers.

[0014] Figures 2 and 3 represent the outer side and the inner side, respectively, of the front of the structure 2 of the oven, here constituted by a substantially quadrangular frame (in Figure 2 the representation of the knobs 5 has been omitted).

[0015] The frame, designated as a whole by 7, is preferably made of metal material and defines a through opening, which, in the assembled condition, is at the front opening of a cooking chamber, defined by a respective muffle (not represented), which is located within the structure 2. As may be noted, the frame 7 has two lateral uprights 7a, a lower cross member 7b and an upper cross member 7c, which is at least in part shaped to enable support of the control panel 4. In one embodiment, the

upper cross member 7c has edges bent inwards in an area corresponding to the panel 4, as may be seen, for example, in Figures 3 and 4. In the embodiment illustrated, the cross member 7c has edge portions 7d, 7e bent backwards, in the area of the control panel 4, to provide a sort of box-like structure, as may be seen, for example, in Figures 2, 4 and 8, 9.

[0016] From Figures 2 and 3 it may moreover be noted how the upper cross member 7c defines, underneath its area that is to provide the structure of the panel 4, one or more slits 8 for passage of a flow of air. In the assembled condition, the frame 7 is positioned in such a way that within the structure 2 - in a position set behind the slits 8 and above the muffle - there extends a channel, between the frame 7 and a fan (not represented). As already mentioned, the channel may be a channel for conveying a flow of air for cooling the door of the oven, or at least its upper region, or else the channel may belong to a system for expulsion of cooking fumes from the muffle, according to a technique in itself known. The channel, preferentially made of sheet metal, is not represented in the figures.

[0017] The oven 1 has a control system, which comprises a main control board, designated by 10 in Figure 3. As may be seen also in Figures 4 and 5, visible in which are the back and the front, respectively, of the board 10, this includes a circuit support 11 made of an electrically insulating material, associated to which are a plurality of electrical and/or electronic components, some of which designated by 12, for control of various functions of the oven. The circuit support 11 may, for example, be constituted by a printed-circuit board made of fibreglass or similar material, provided on which are a plurality of conductive paths and pads for installation and electrical connection of the components 12. The board 10 is here defined as "main board" in so far as it is subjected to the a.c. voltage of the electrical mains supply to which the oven 1 is connected, for example a 230-V single-phase voltage, and is configured for control of its electrical loads supplied at the aforesaid mains-supply voltage (for example, one or more heating elements). Preferentially, the components 12 include transformer and rectifier means, for supply of low-voltage loads, such as for example the display 6.

[0018] Unlike the known art, according to which the main control board of the appliance is fixed on a channel of the type indicated previously, in the case of the present invention the board 10 is mounted on the front of the structure 2 of the appliance 1, here represented by the frame 7, in particular in the area of the latter that is to constitute the structure of the control panel 4.

[0019] The knobs 5 of Figure 1 are, as has been said, associated to respective electrical selectors, designated by 13 in Figure 5. As may be seen also in Figure 6, the selectors 13 have a selector body 14 with a first end - here defined as "front end" - that is to be secured to the frame 7, on the inner side of the latter, with the knobs 5 that instead can be operated on the opposite side of the

frame 7, i.e., on the outside of the structure 2. For this purpose, each selector 13 has an actuation part that passes through a corresponding opening in the frame 7. In the case exemplified, the aforesaid actuation part is constituted by a rotary shaft 15, associated to which is the respective knob 5.

[0020] The aforesaid openings for passage of the shafts 15 are designated by 16 in Figure 2. In a preferred, though non-exclusive, embodiment, the openings 16 are formed at respective recesses 17 which are at the portion of the upper cross member 7c belonging to the control panel 4. The recesses 17, obtained for example via drawing or stamping of the sheet metal that provides the frame 7, have their respective concavity facing the outside of the structure 2.

[0021] Preferably provided within the recesses 17 are first seats or openings 18 for fixing of the selector bodies 15, via suitable fixing members, for example screws or similar threaded members (not represented). In this way, the heads of the aforesaid fixing members can remain within the respective recesses 17, i.e., substantially without projecting at the front from the front side of the panel 4. In a preferred embodiment, within the recesses 17 second holes 19 are also provided, the function of which will be clarified hereinafter.

[0022] According to a characteristic of the invention, the selector bodies 14 are secured to the circuit support 11 of the board 10, at their second ends - here defined as "rear ends" - with the selector bodies 14 in positions set at a distance from each other, as clearly visible for example in Figure 5. As may be appreciated, since the selector bodies 14 are secured at the front to the frame 7 and secured in their rear part to the circuit support 11, the latter is supported as a whole by the selectors 13 themselves, in a position spaced apart from the inner side of the frame 7, very preferably parallel thereto.

[0023] The fact that the board 12 is directly supported by the selectors 13, and more precisely by their bodies 14, affords considerable advantages from the standpoint of ease of assembly of the appliance 1 and of reduction of the corresponding costs. In particular, the fact that the board 10 is supported directly by the selector bodies 14 has as consequence that no purposely designed brackets are required, as instead is envisaged, according to the known art, for supporting a control board on a cooling and/or ventilation channel. In this regard, it is to be considered that anchorage of the board 10 to the structure 2 is obtained, according to the invention, via an operation in any case indispensable in the course of assembly of the appliance 1, i.e., the operations of fixing of the selectors to the front frame 7. Another substantial advantage of the invention is represented by the fact that no cables are necessary for connection of the selectors 13 to the board 10, which are typical instead of the known art, in which the control board is in a relatively remote position with respect to the control panel.

[0024] In a preferred embodiment of the invention, the selector bodies 14 are engaged by snap action on the

circuit support 11 of the board 10. Preferentially, as may be seen for example in Figure 6, the selector bodies 14 have, in their rear-end portion, one or more elements for engagement to the circuit support 11, in particular elastically deformable coupling elements. In the example represented, these elements are constituted by tabs 20 with terminal teeth, preferably provided in pairs on opposite sides of the body 14. The aforesaid tabs 20 are designed to engage in corresponding seats or openings of the circuit support 11, in particular in through openings between its two opposite major faces, as may be seen in the detail of Figure 7, where the openings are designated by 21 and where the teeth of the tabs 20, here designated by 20a, are partially visible. Advantageously, the tabs 20 are made of a single piece with the selector bodies 14, which are preferably made of an electrically insulating material, such as a plastic material, for instance, a mouldable thermoplastic material.

[0025] As may be understood, also this type of assembly of the selector bodies 14 with respect to the circuit support 11 is extremely advantageous and fast. Electrical connection of the selectors 13 to the circuit support 11, for example to its electrically conductive paths, can be obtained in any known way, for example via male-female coupling terminals, or else envisaging spring-action terminals in an area corresponding to the back of the body 14 that are designed to press on conductive paths or pads of the support 11.

[0026] In a particularly advantageous embodiment, the selector bodies 14 also have, at their front ends, further coupling elements, for coupling to the frame 7. Also these further elements are preferentially configured for snap-action coupling, and may advantageously be made of a single piece with the selector bodies 14. The coupling elements provided in the front part of the selector bodies 14 are visible for example in Figure 6, where they are designated by 22, in the form of elastically deformable tabs provided with a terminal tooth. Preferentially, also the tabs 22 are located on opposite sides of the body 14, very preferably sides orthogonal to those provided with the tabs 20 for engagement to the circuit support 11.

[0027] The selector bodies 14 are fixed to the front frame 7 preferably via threaded members, for example screws, which pass through respective openings provided in the frame, here represented by the holes designated by 18 in Figure 2. In one embodiment, the frame 7 further comprises a plurality of second seats or openings, for coupling with the engagement tabs 22 provided in the front part of the selector body 14, here represented by the through holes designated by 19 in Figure 2.

[0028] Also provision of the engagement tabs 20 is particularly advantageous for the purposes of assembly of the cooking appliance. In fact, in the assembly step, the control board 10 already provided with the selector bodies 14 can be temporarily engaged in a non-definitive way from the back of the frame 7, by coupling the tabs 22 to the respective holes 19. Following upon this preliminary coupling, the person responsible for carrying out

assembly is facilitated in the subsequent operation of fixing proper of the selector bodies to the frame 7, and hence of the entire board 10. This final fixing is made from the front of the frame 7, using, as has been said, threaded members, such as screws, which are inserted through the holes 18 of Figure 2 and tightened in corresponding threaded holes or seats provided at the front end of the selector body. Examples of such holes or seats are designated by 23 in Figure 6. In the fixed condition, as may be seen for example in Figures 8 and 9, the circuit support 11 has one of its major faces facing the inner side of the control panel 7, preferably substantially parallel thereto.

[0029] In a preferred embodiment, and as will be appreciated in particular in Figure 2, the fixing holes 18 comprise two holes in first positions diametrically opposite with respect to the corresponding opening 16 of the frame 7, and the engagement holes 19 also comprise two holes, in second positions diametrically opposite with respect to the opening 16 itself, as is clearly visible in Figure 2. Thanks to this configuration, the aforesaid preliminary engagement of the selector bodies 14, and hence of the board 10, to the frame 7, and subsequent fixing of the selector bodies 14 to the frame itself can be made in very simple and convenient way.

[0030] In a particularly advantageous embodiment, the control system of the appliance 1 comprises at least one further electrical and/or electronic module, here referred to as "auxiliary module", which is electrically connected to the board 10, where also this auxiliary module is supported by the front of the structure 2, here represented by the frame 7. This auxiliary module, which may be itself constituted by a board carrying electrical and/or electronic components, is positioned in a space comprised between the inner side of the frame 7 and the circuit support 11 of the board 10, in an intermediate position with respect to the two selectors 13. The auxiliary module is preferentially a module supplied at low voltage, for example a 12-V d.c. voltage, very preferably via the main board 10.

[0031] An example of the above embodiment is visible in Figures 8 and 9, where designated precisely by 30 is the aforesaid auxiliary module, here forming part of the display system of the appliance, in particular of the display 6. In the example illustrated, the display 6 comprises a frame 6a, which is inserted and secured in a respective through opening provided in the portion of the frame 7 that forms the control panel 4, in an intermediate position with respect to the knobs 5, with the module 30 that is supported by the frame 6a in a position set behind the frame 7 and that here includes the display part of the display 6, for example of an LCD type, supplied at low voltage. As may be noted, in the assembled condition, the auxiliary module 30 is located in an area comprised between the rear side or inside the frame 7 and the circuit support 11 of the board 10. Between the auxiliary module 30 and the board 10 there will be provided suitable electrical connection means (not represented), such as for example a wiring provided with connectors at the two

ends.

[0032] Preferentially, the selector bodies 14 are secured in respective end regions of the circuit support 11 generally opposite to one another. This characteristic may be clearly appreciated, for example, from Figure 5. This positioning, albeit non-imperative, is particularly advantageous for supporting substantially in cantilever fashion the circuit support 11, and consequently the entire board 10.

[0033] To return to Figures 8 and 9 the relative arrangement of the parts may be clearly seen. For instance, in Figure 8 a selector body 14 is clearly visible, passing through which is the corresponding shaft 15, inserted in the corresponding opening 16. There may moreover be noted the conformation of the recesses 17 defined on the frame 7, in a position corresponding to which the opening 16A is located, as well as the openings 18 and 19 of Figure 2, here not visible. There may also be clearly noted one of the hooks 22 provided in the front part of the selector body 14, as well as two of the hooks 20 provided in the rear part of the body 14 itself, for coupling to the frame 7 and to the circuit support 11, respectively. Visible in Figure 9 is the system of assembly of the display device 6 already described, which on the other hand could be different from the one exemplified, provided that the corresponding module 30 is positioned between the circuit support 11 of the board 10 and the back of the frame 7.

[0034] In a preferred embodiment, the selector bodies 14 support the circuit support 11 at a distance of at least 3 cm from the inner or rear side of the frame 7, this dimension being denoted by A in Figure 8. In a configuration of the type as the one illustrated, it is moreover preferable for the selector bodies 14 to support the circuit support 11 at a distance of at least 1.5 cm from the back of the auxiliary module 30, preferably at least 1.8 cm, this dimension being denoted by B in Figure 9. The distances suggested guarantee the necessary electrical and electromagnetic safety of the board 10 with respect to the surrounding parts.

[0035] In a preferred embodiment of the invention, the circuit support 11 has a length of between 30 and 40 cm and a width of between 5 and 7.5 cm, these dimensions being denoted by L and W, respectively in Figure 2. With the above sizing, the circuit support 11, preferably of a substantially rectangular shape, is sufficiently extensive to contain the electrical and electronic components normally provided on control boards of the type indicated, at the same time guaranteeing an adequate distance between the selectors 13, which enables positioning between them of other functional elements, such as for example the display 6 previously described. For this purpose it is moreover preferable for, in particular in the case of presence of a module 30 or the like, the more cumbersome circuit components 12 of the board 10 to be associated to the rear side of the corresponding support 11.

[0036] From the foregoing description, the character-

istics of the present invention emerge clearly, as likewise its advantages, principally represented by the simplicity, rapidity, and low cost of the fixing system proposed for an electronic control board of a cooking appliance.

[0037] It is clear that numerous variations may be made by the person skilled in the art to the cooking appliance described by way of example, without thereby departing from the scope of the invention as defined in the ensuing claims.

[0038] In the embodiment exemplified in the figures, the front of the appliance is prevalently constituted by a frame 7 made of a single piece, but the functions of the latter can be obtained also via a plurality of structural components configured as distinct elements assembled and/or fixed together, such as for example cross members and uprights.

Claims

1. A household cooking appliance having a load-bearing structure (2) with a front (7) associated to which is a door (3) for closing a cooking chamber, above the door (3) the front (7) of the structure (2) having a control panel (4) that includes at least two manual-control members (5) associated to two corresponding selectors (13), for selection of respective operating conditions of the appliance (1), wherein the selectors (13) each have a selector body (14), which is secured at a first end thereof at an inner side of the front (7) of the structure (2), and each manual-control member (5) can be operated at an outer side of the front (7) of the structure (2), each selector (13) having an actuation part (15) that passes through a corresponding opening (16) of the front (7) of the structure (2),

characterized in that

the appliance (1) has a control system (10, 30), which comprises one main control board (10) to which the selectors (13) are electrically connected, the main control board (10) including a circuit support (11) having associated thereto a plurality of electrical and/or electronic components (12), and the selector bodies (14) are secured to the circuit support (11) at their second ends, in positions spaced apart from each other, with the selector bodies (14) that support the circuit support (11) in a position spaced apart from the inner side of the front (7) of the structure (2).

2. The appliance according to Claim 1, wherein the selector bodies (14) have, at their first ends, first coupling elements (20), for coupling to the front (7) of the structure (2), in particular elastically deformable coupling elements.
3. The appliance according to Claim 1 or Claim 2, wherein the selector bodies (14) have, at their sec-

ond ends, second coupling elements (22), for coupling to the circuit support (11), in particular elastically deformable coupling elements.

4. The appliance according to Claim 2 or Claim 3, wherein the front (7) of the structure (2) has a plurality of first seats or openings (19) for coupling with respective first coupling elements (22) of a selector body (14).
5. The appliance according to Claim 3 or Claim 4, wherein the circuit support (11) has a plurality of seats or openings (21) for coupling with respective second coupling elements (20) of a selector body (14).
6. The appliance according to any one of the preceding claims, wherein the selector bodies (14) are secured at their respective first ends to the front (7) of the structure (2) via fixing members passing through respective fixing holes (18) of said front (7).
7. The appliance according to Claims 4 and 6, wherein:
 - the fixing holes (18) comprise two holes in first positions diametrically opposite with respect to the opening (16) of the front (7) of the structure (2), passing through which is the actuation part (15) of a corresponding selector (13); and
 - the first seats or openings (19) comprise two openings in second positions diametrically opposite with respect to the opening (16) of the front (7) of the structure (2), passing through which is the actuation part (15) of a corresponding selector (13).
8. The appliance according to Claim 1, further comprising at least one auxiliary electrical and/or electronic module (30), which is electrically connected to the control board (10), the auxiliary module (30) being supported by the front (7) of the structure (2) in a space comprised between said front (7) and the circuit support (11) of the control board (10).
9. The appliance according to Claim 8, wherein the auxiliary module (30) belongs to a display system that includes a display device (6) mounted in a respective opening of the front (7) of the structure (2) that is set in an intermediate position with respect to the two selector bodies (14).
10. The appliance according to any one of the preceding claims, wherein the selectors (13) are rotary selectors, the two manual-control members (5) being rotary knobs.
11. The appliance according to any one of the preceding claims, wherein the circuit support (11) has a gen-

erally elongated shape, and the selector bodies (14) are secured in respective end regions of the circuit support (11).

12. The appliance according to any one of the preceding claims, wherein the selector bodies (14) support the circuit support (11) at a distance of at least 3 cm with respect to the inner side of the front (7) of the structure (2), preferably parallel thereto.
13. The appliance according to any one of the preceding claims, wherein the circuit support (11) has a length comprised between 30 and 40 cm and a height comprised between 5 and 7.5 cm.
14. The appliance according to Claim 8 or Claim 9, wherein the selector bodies (14) support the circuit support (11) at a distance of at least 1.5 cm from a back of the auxiliary module (30), in particular at least 1.8 cm.

Patentansprüche

1. Haushaltsgargerät mit einer lasttragenden Struktur (2) mit einer Vorderseite (7), mit der eine Tür (3) zum Schließen eines Garraumes verbunden ist, wobei die Vorderseite (7) der Struktur (2) über der Tür (3) ein Bedienfeld (4) hat, das zumindest zwei manuelle Steuerungselemente (5) umfasst, die mit zwei entsprechenden Auswahlvorrichtungen (13) verbunden sind, zur Auswahl von entsprechenden Betriebsbedingungen des Gerätes (1), wobei die Auswahlvorrichtungen (13) jeweils einen Auswahlvorrichtungskörper (14) haben, der an einem ersten Ende davon an einer Innenseite der Vorderseite (7) der Struktur (2) gesichert ist, und jedes manuelle Steuerungselement (5) an einer Außenseite der Vorderseite (7) der Struktur (2) betätigt werden kann, wobei jede Auswahlvorrichtung (13) einen Betätigungsteil (15) hat, der durch eine entsprechende Öffnung (16) der Vorderseite (7) der Struktur (2) hindurch verläuft, **dadurch gekennzeichnet, dass**

das Gerät (1) ein Steuerungssystem (10, 30) hat, das eine Hauptsteuerplatine (10), mit der die Auswahlvorrichtungen (13) elektrisch verbunden sind, umfasst,

wobei die Hauptsteuerplatine (10) einen Schaltungsträger (11) umfasst, der eine Vielzahl von elektrischen und/oder elektronischen Komponenten (12) damit verbunden hat, und die Auswahlvorrichtungskörper (14) an dem Schaltungsträger (11) an ihren zweiten Enden in voneinander beabstandeten Positionen gesichert sind,

wobei die Auswahlvorrichtungskörper (14), die den Schaltungsträger (11) tragen, in einer Po-

sition sind, die von der Innenseite der Vorderseite (7) der Struktur (2) beabstandet ist.

2. Gerät nach Anspruch 1, wobei die Auswahlvorrichtungskörper (14) an ihren ersten Enden erste Koppelungselemente (20) zum Koppeln mit der Vorderseite (7) der Struktur (2), insbesondere elastisch verformbare Koppelungselemente, haben.
3. Gerät nach Anspruch 1 oder Anspruch 2, wobei die Auswahlvorrichtungskörper (14) an ihren zweiten Enden zweite Koppelungselemente (22) zum Koppeln mit dem Schaltungsträger (11), insbesondere elastisch verformbare Koppelungselemente, haben.
4. Gerät nach Anspruch 2 oder Anspruch 3, wobei die Vorderseite (7) der Struktur (2) eine Vielzahl von ersten Sitzen oder Öffnungen (19) zum Koppeln mit entsprechenden ersten Koppelungselementen (22) eines Auswahlvorrichtungskörpers (14) hat.
5. Gerät nach Anspruch 3 oder Anspruch 4, wobei der Schaltungsträger (11) eine Vielzahl von Sitzen oder Öffnungen (21) zum Koppeln mit entsprechenden zweiten Koppelungselementen (20) eines Auswahlvorrichtungskörpers (14) hat.
6. Gerät nach einem der vorstehenden Ansprüche, wobei die Auswahlvorrichtungskörper (14) an ihren entsprechenden ersten Enden an der Vorderseite (7) der Struktur (2) über Befestigungselemente, die durch entsprechende Befestigungslöcher (18) der Vorderseite (7) hindurch verlaufen, gesichert sind.
7. Gerät nach den Ansprüchen 4 und 6, wobei:
 - die Befestigungslöcher (18) zwei Löcher in ersten Positionen diametral gegenüberliegend bezogen auf die Öffnung (16) der Vorderseite (7) der Struktur (2) umfassen, durch die der Betätigungsteil (15) einer entsprechenden Auswahlvorrichtung (13) verläuft, und
 - die ersten Sitze oder Öffnungen (19) zwei Öffnungen in zweiten Positionen diametral gegenüberliegend bezogen auf die Öffnung (16) der Vorderseite (7) der Struktur (2) umfassen, durch die der Betätigungsteil (15) einer entsprechenden Auswahlvorrichtung (13) verläuft.
8. Gerät nach Anspruch 1, weiter umfassend zumindest ein elektrisches und/oder elektronisches Hilfsmodul (30), das elektrisch mit der Steuerplatine (10) verbunden ist, wobei das Hilfsmodul (30) durch die Vorderseite (7) der Struktur (2) in einem Raum, der zwischen der Vorderseite (7) und dem Schaltungsträger (11) der Steuerplatine (10) eingeschlossen ist, getragen wird.

9. Gerät nach Anspruch 8, wobei das Hilfsmodul (30) zu einem Anzeigesystem gehört, das eine Anzeigevorrichtung (6) umfasst, die in einer entsprechenden Öffnung der Vorderseite (7) der Struktur (2) montiert ist, die in eine Zwischenposition bezogen auf die zwei Auswahlvorrichtungskörper (14) gesetzt ist. 5
10. Gerät nach einem der vorstehenden Ansprüche, wobei die Auswahlvorrichtungen (13) Drehauswahlvorrichtungen sind, wobei die zwei manuellen Steuerungselemente (5) Drehknöpfe sind. 10
11. Gerät nach einem der vorstehenden Ansprüche, wobei der Schaltungsträger (11) eine im Allgemeinen längliche Form hat und die Auswahlvorrichtungskörper (14) in entsprechenden Endbereichen des Schaltungsträgers (11) gesichert sind. 15
12. Gerät nach einem der vorstehenden Ansprüche, wobei die Auswahlvorrichtungskörper (14) den Schaltungsträger (11) mit einem Abstand von zumindest 3 cm bezogen auf die Innenseite der Vorderseite (7) der Struktur (2), bevorzugt parallel dazu, tragen. 20
13. Gerät nach einem der vorstehenden Ansprüche, wobei der Schaltungsträger (11) eine Länge zwischen 30 und 40 cm und eine Höhe zwischen 5 und 7,5 cm hat. 25
14. Gerät nach Anspruch 8 oder Anspruch 9, wobei die Auswahlvorrichtungskörper (14) den Schaltungsträger (11) mit einem Abstand von zumindest 1,5 cm von einer Rückseite des Hilfsmoduls (30), insbesondere zumindest 1,8 cm, tragen. 30

Revendications

1. Appareil électroménager de cuisson ayant une structure porteuse de charge (2) avec un avant (7) auquel est associée une porte (3) pour fermer une chambre de cuisson, au-dessus de la porte (3) l'avant (7) de la structure (2) ayant un panneau de commande (4) qui inclut au moins deux éléments de commande manuelle (5) associés à deux sélecteurs correspondants (13), pour la sélection de conditions de fonctionnement respectives de l'appareil (1), dans lequel les sélecteurs (13) ont chacun un corps de sélecteur (14), qui est fixé au niveau d'une première extrémité de ce dernier au niveau d'un côté intérieur de l'avant (7) de la structure (2), et chaque élément de commande manuelle (5) peut être mis en oeuvre au niveau d'un côté extérieur de l'avant (7) de la structure (2), chaque sélecteur (13) ayant une partie d'actionnement (15) qui passe à travers une ouverture correspondante (16) de l'avant (7) de la structure (2), 40
- caractérisé en ce que** 45
- 50
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l'appareil (1) a un système de commande (10, 30), qui comprend une carte de commande principale (10) à laquelle les sélecteurs (13) sont électriquement reliés, la carte de commande principale (10) incluant un support de circuit (11) ayant associés à ce dernier une pluralité de composants électriques et/ou électroniques (12), et les corps de sélecteur (14) sont fixés au support de circuit (11) au niveau de leurs secondes extrémités, dans des positions espacées les unes des autres, les corps de sélecteur (14) qui supportent le support de circuit (11) étant dans une position espacée du côté intérieur de l'avant (7) de la structure (2).

2. Appareil selon la revendication 1, dans lequel les corps de sélecteur (14) ont, au niveau de leurs premières extrémités, des premiers éléments d'accouplement (20), pour l'accouplement à l'avant (7) de la structure (2), en particulier des éléments d'accouplement déformables de façon élastique. 15
3. Appareil selon la revendication 1 ou la revendication 2, dans lequel les corps de sélecteur (14) ont, au niveau de leurs secondes extrémités, des seconds éléments d'accouplement (22), pour l'accouplement au support de circuit (11), en particulier des éléments d'accouplement déformables de façon élastique. 20
4. Appareil selon la revendication 2 ou la revendication 3, dans lequel l'avant (7) de la structure (2) a une pluralité de premiers sièges ou ouvertures (19) pour l'accouplement avec des premiers éléments d'accouplement respectifs (22) d'un corps de sélecteur (14). 25
5. Appareil selon la revendication 3 ou la revendication 4, dans lequel le support de circuit (11) a une pluralité de sièges ou d'ouvertures (21) pour l'accouplement avec des seconds éléments d'accouplement respectifs (20) d'un corps de sélecteur (14). 30
6. Appareil selon l'une quelconque des revendications précédentes, dans lequel les corps de sélecteur (14) sont fixés au niveau de leurs premières extrémités respectives à l'avant (7) de la structure (2) via des éléments de fixation passant à travers des trous de fixation respectifs (18) dudit avant (7). 35
7. Appareil selon les revendications 4 et 6, dans lequel:
- les trous de fixation (18) comprennent deux trous dans des premières positions diamétralement opposées par rapport à l'ouverture (16) de l'avant (7) de la structure (2), passage à travers lequel se trouve la partie d'actionnement (15) d'un sélecteur correspondant (13) ; et
 - les premiers sièges ou ouvertures (19) comprennent deux ouvertures dans des secondes

positions diamétralement opposées par rapport à l'ouverture (16) de l'avant (7) de la structure (2), passage à travers lequel se trouve la partie d'actionnement (15) d'un sélecteur correspondant (13).

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8. Appareil selon la revendication 1, comprenant en outre au moins un module électrique et/ou électronique auxiliaire (30), qui est électriquement relié à la carte de commande (10), le module auxiliaire (30) étant supporté par l'avant (7) de la structure (2) dans un espace compris entre ledit avant (7) et le support de circuit (11) de la carte de commande (10). 10
9. Appareil selon la revendication 8, dans lequel le module auxiliaire (30) appartient à un système d'affichage qui inclut un dispositif d'affichage (6) monté dans une ouverture respective de l'avant (7) de la structure (2) qui est mis dans une position intermédiaire par rapport aux deux corps de sélecteur (14). 15 20
10. Appareil selon l'une quelconque des revendications précédentes, dans lequel les sélecteurs (13) sont des sélecteurs rotatifs, les deux éléments de commande manuelle (5) étant des boutons rotatifs. 25
11. Appareil selon l'une quelconque des revendications précédentes, dans lequel le support de circuit (11) a une forme globalement allongée, et les corps de sélecteur (14) sont fixés dans les régions d'extrémité respectives du support de circuit (11). 30
12. Appareil selon l'une quelconque des revendications précédentes, dans lequel les corps de sélecteur (14) supportent le support de circuit (11) à une distance d'au moins 3 cm par rapport au côté intérieur de l'avant (7) de la structure (2), de préférence parallèle à celui-ci. 35
13. Appareil selon l'une quelconque des revendications précédentes, dans lequel le support de circuit (11) a une longueur comprise entre 30 et 40 cm et une hauteur comprise entre 5 et 7,5 cm. 40
14. Appareil selon la revendication 8 ou la revendication 9, dans lequel les corps de sélecteur (14) supportent le support de circuit (11) à une distance d'au moins 1,5 cm d'un dos du module auxiliaire (30), en particulier au moins 1,8 cm. 45

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Fig. 1

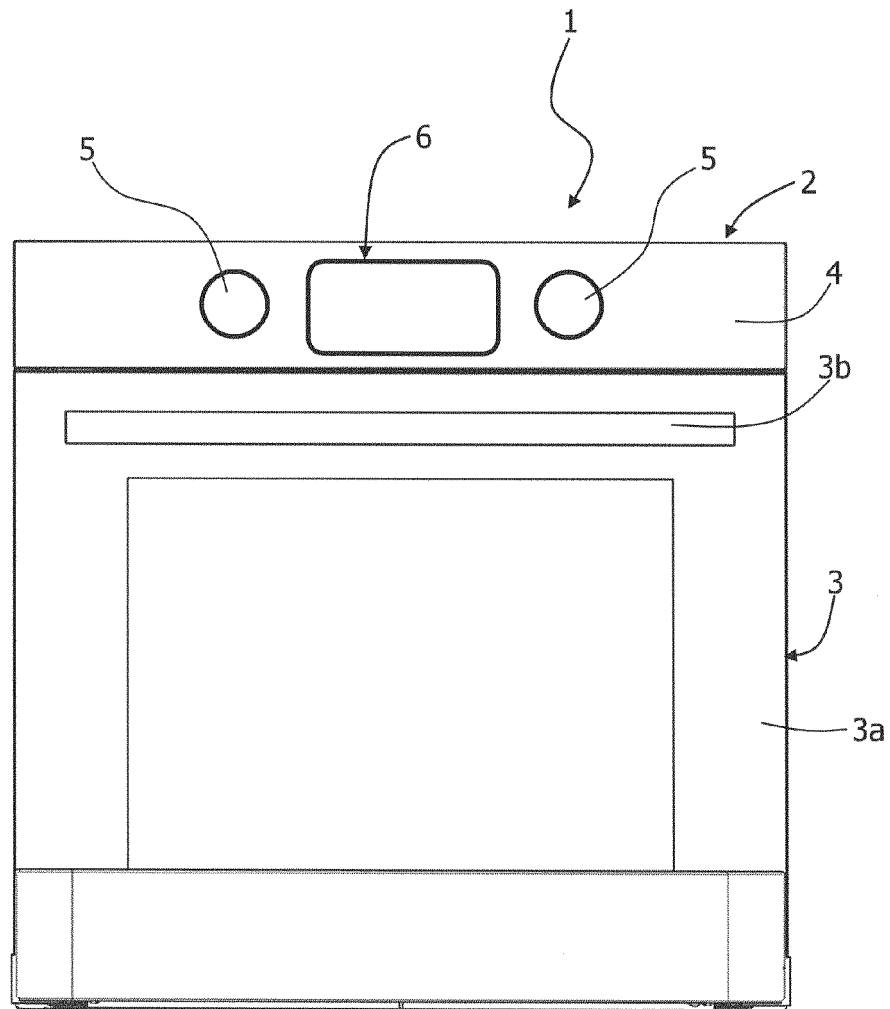


Fig. 2

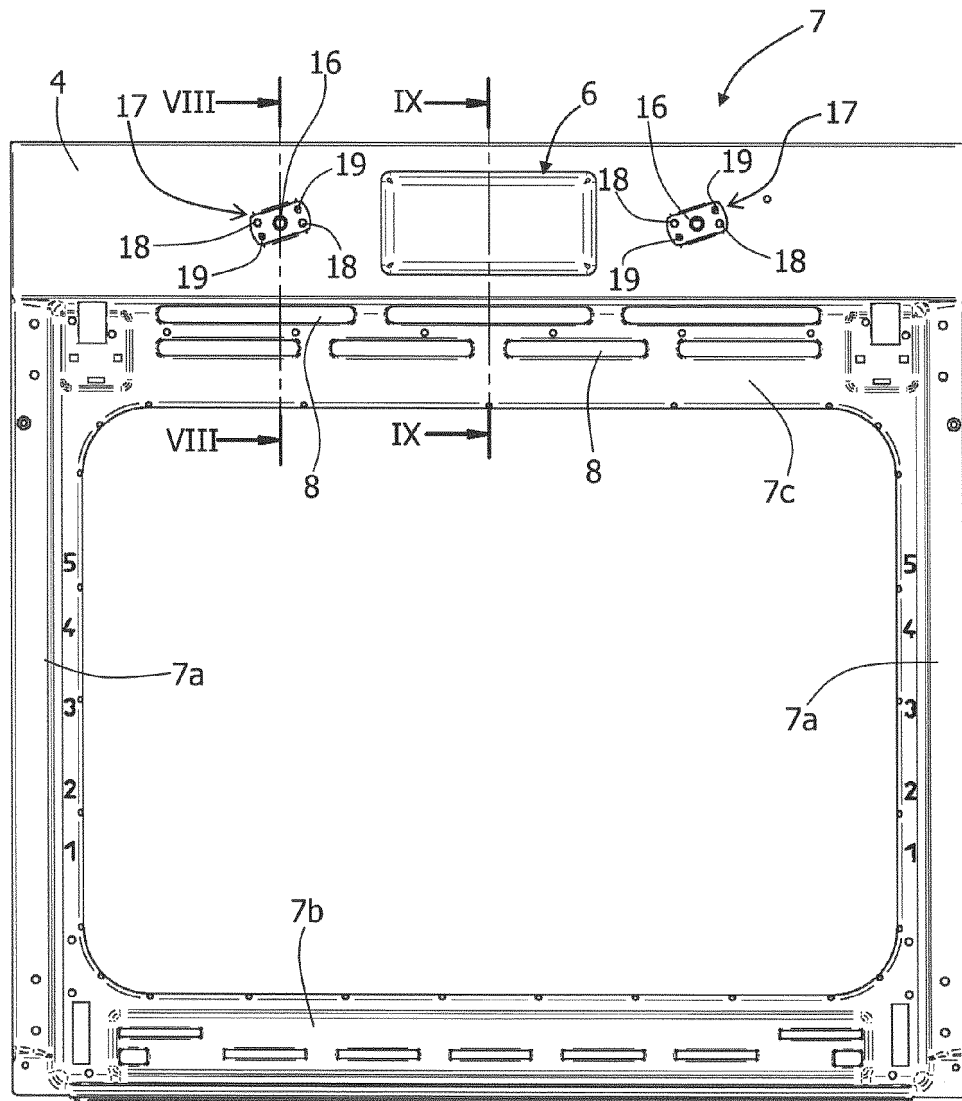


Fig. 3

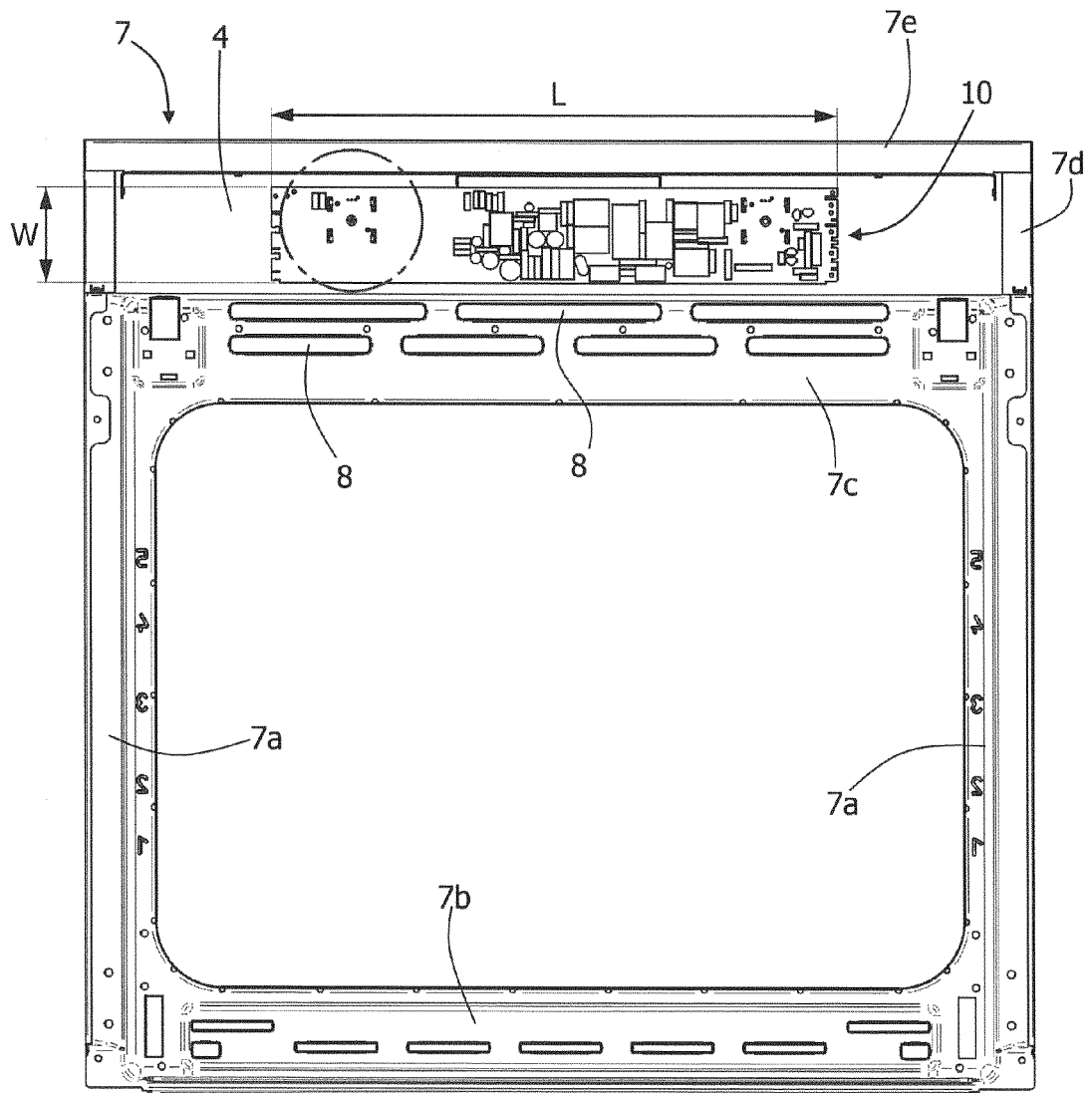


Fig. 4

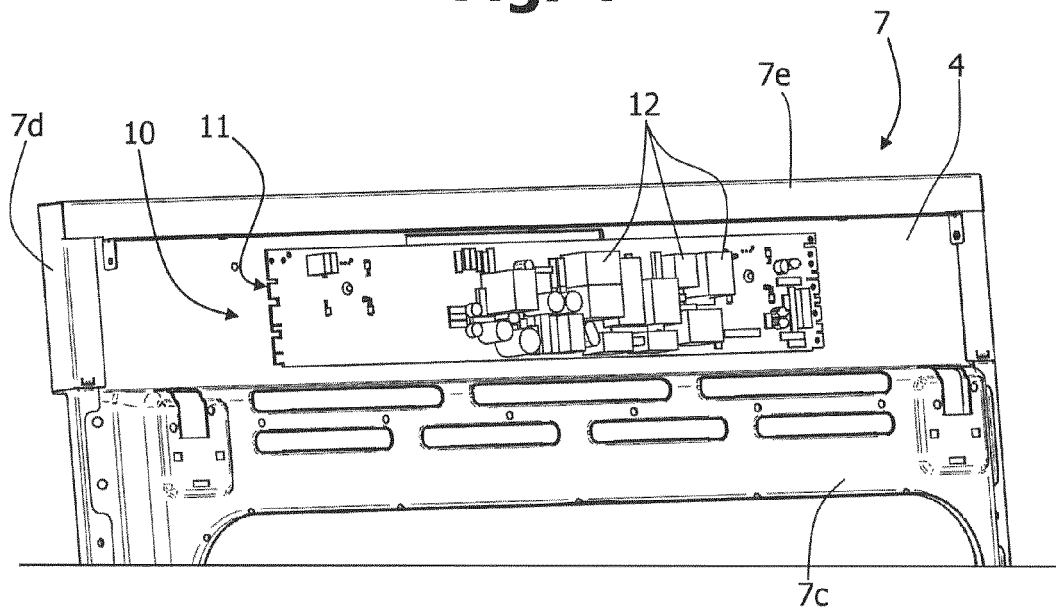


Fig. 5

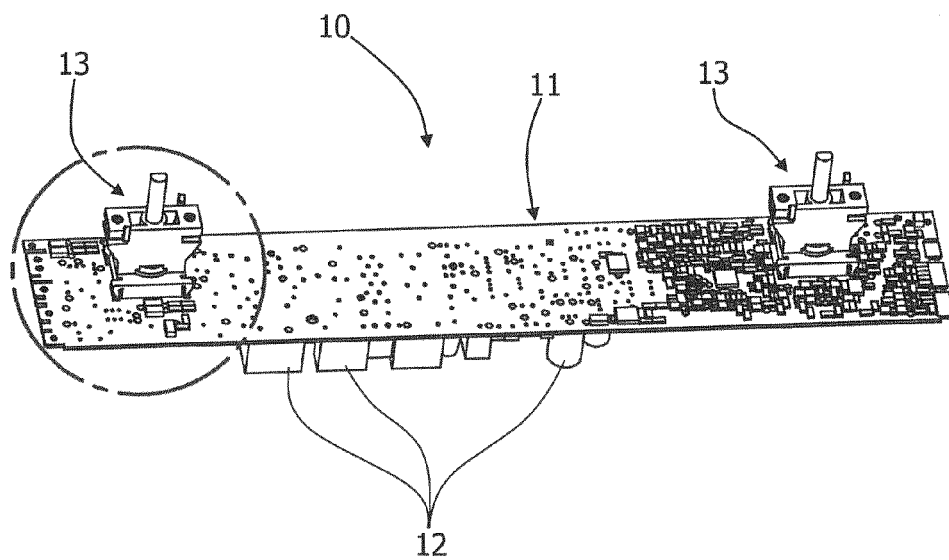


Fig. 6

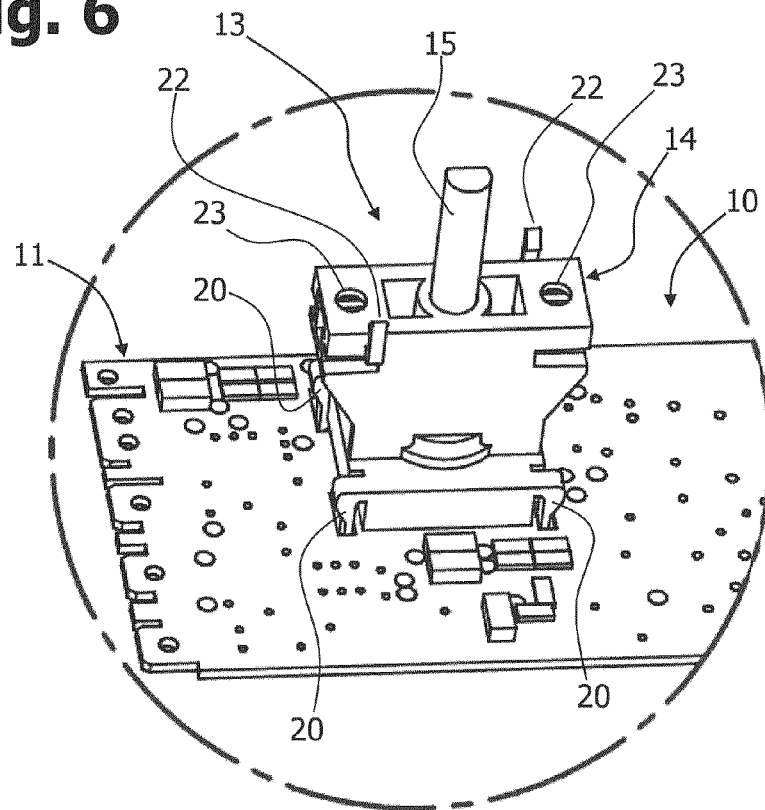


Fig. 7

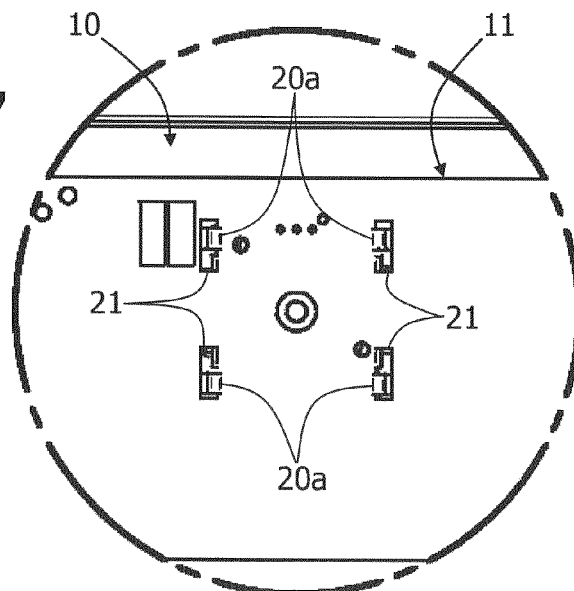


Fig. 8

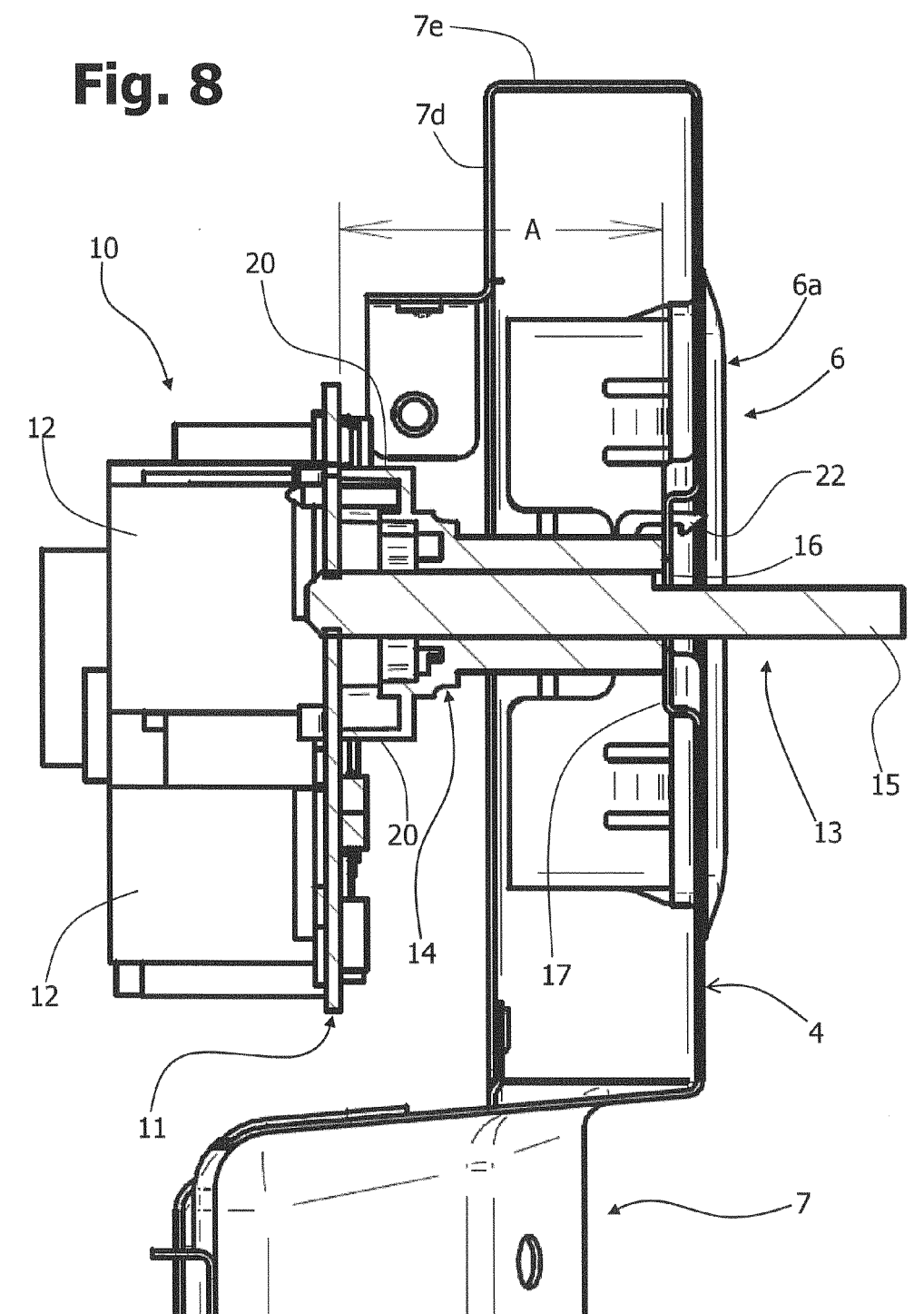
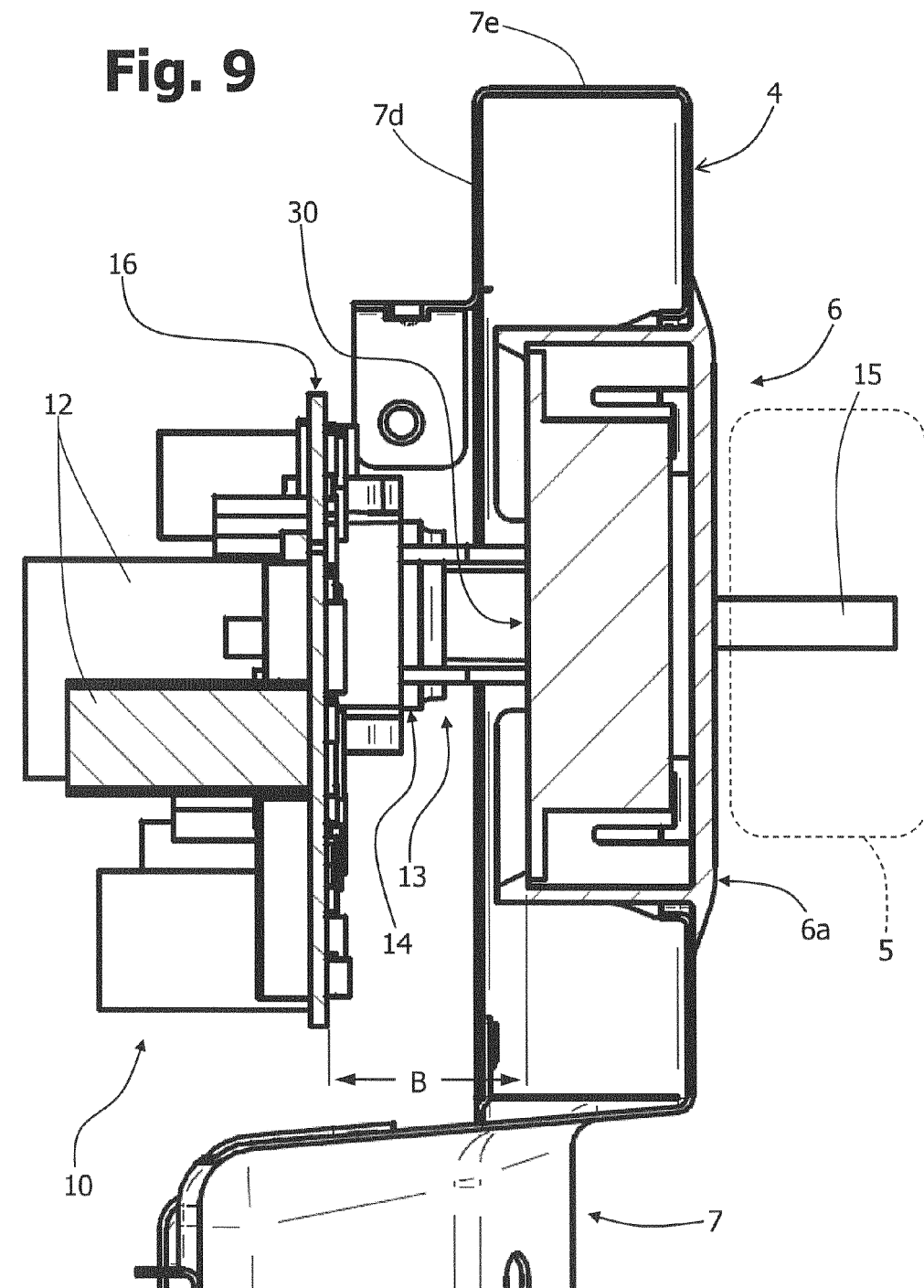


Fig. 9



REFERENCES CITED IN THE DESCRIPTION

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