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(54) **Cooking appliance adapted for low-pressure cooking**

(57) Door adapted to close a cooking chamber comprised in a cooking body of a cooking device for low pressure cooking, which comprises an exterior panel (95), an interior panel (96), and at least one support (91) attached to the exterior panel (95) in which at least partially the interior panel (96) is housed. The door (75) comprises compensation means (100) coupled to the exterior panel (95), upon which rests the interior panel (96), the compensation means (100) being adapted to move the interior panel (96) in relation to the support (91) and to ensure contact between the interior panel (96) along a closed contour, against a sealing gasket attached to the cooking body.

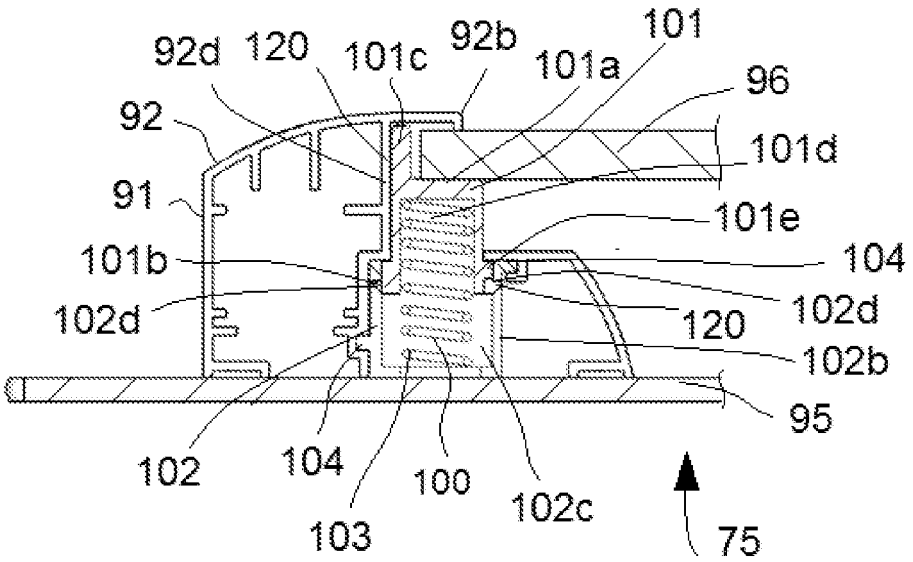

FIG. 15

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Description

TECHNICAL FIELD

[0001] This invention relates to a cooking appliance adapted for low-pressure or vacuum cooking.

PRIOR ART

[0002] Vacuum or low-pressure cooking is a known cooking technique, the objective of which is to enhance the flavour and aroma of the food to be cooked and to ensure its salubriousness and subsequent conservation. This type of cooking enables cooking at a reduced temperature, with the result that the food is not overcooked, the inner part of the food, as well as the exterior surface, is properly cooked; and that vitamins are not lost during cooking.

[0003] In the state of the art, there are known ovens wherein vacuum is carried out in its interior. In EP717917B1, it is described an oven that comprises a cooking chamber, a door which closes the cooking chamber and evacuation means for reducing the pressure in the interior of the cooking chamber, the evacuation means including an evacuation conduit that communicates the evacuation means with a bottom area and a top area of the cooking chamber. The door seals the cooking chamber when closing against a sealing gasket arranged around the cooking chamber. The pressure inside the cooking chamber is selected with the result that the vacuum in inside the cooking chamber is obtained selectively from the bottom area or from the top area.

[0004] In JP2008-175421 it is described a microwave oven that comprises a cooking chamber, a door which closes the cooking chamber, a body housed inside the chamber, which is fixed sealed to the base of the chamber and which includes a conduit through which the vacuum is formed inside the body. The inner body withstands the vacuum conditions, thereby enabling the conventional outer structure of a microwave oven to be maintained.

[0005] On the other hand, there are known doors adapted to close the cooking cavity of a domestic oven which comprise an exterior panel, an interior panel which closes the cooking cavity, and intermediate panels arranged between the exterior panel and the interior panel in a support which is jointly fixed to the interior panel, and upon which the panel exterior is fixed, such as described in EP1783433A1.

[0006] A problem associated to the ovens, in particular to the vacuum ovens, is the difficulty to achieve an optimal closure of the door against the chamber in which the vacuum is caused.

DISCLOSURE OF THE INVENTION

[0007] The object of this invention is to provide a door adapted for closing a cooking chamber comprised in a cooking body of a cooking device for low pressure cooking as defined in the claims.

[0008] The door comprises an exterior panel, at least one support attached to the exterior panel, and an interior panel that is arranged housed at least partially in the support. The door also comprises compensation means coupled to the exterior panel, upon which rests an interior panel, so that the compensation means are adapted for moving the interior panel in relation to the exterior panel, ensuring contact between the interior panel against a sealing gasket attached to the cooking body, along a closed contour.

[0009] The compensation means allow the interior panel to be perfectly adapted to the sealing gasket, applying a force necessary to ensure the leak tightness of the joint along the closed contour. Therefore, by ensuring contact between the interior panel and the sealing gasket along the closed contour when the door is in a closed position, it is ensured that the cooking device can produce a vacuum inside the cooking body in an effective manner.

[0010] Furthermore, the compensation means allow the interior panel to deform without interfering with the support, avoiding the generation of momentary thermal tensions that would break said interior panel.

[0011] Finally, the compensation means allow the absorption of the manufacturing and assembly tolerances of the sealing gasket, support as well as the interior panel.

[0012] These and other advantages and characteristics of the invention will become evident in the light of the drawings and the detailed invention description.

DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 shows a section view of the cooking appliance which comprises a cooking body, a door and a sealing gasket according to the invention.

Fig. 2 shows a front view of the cooking appliance shown in Figure 1, without a door.

Fig. 3 shows a perspective view of the cooking body shown in Figure 1, without an exterior casing or a door.

Fig. 4 shows a perspective section view of the cooking body comprised in the cooking appliance shown in Figure 1.

Fig. 5 shows a perspective view of a first body comprised in the cooking body of the cooking appliance shown in Figure 1.

Fig. 6 shows a perspective view of a second body comprised in the cooking body of the cooking appliance shown in Figure 1.

Fig. 7 shows a longitudinal section of the second

body shown in Figure 6.

Fig. 8 shows a detail of the second body shown in Figure 7.

Fig. 9 shows a detail of the closure of the door against the cooking body shown in

Figure 1.

Fig. 10 shows a superior view of a first embodiment of the door according to the invention.

Fig. 11 shows a perspective view of the door shown in Figure 10.

Fig. 12 shows a perspective view of the door shown in the figure 10 without an interior panel.

Fig. 13 shows a perspective view of a support and of compensation means comprised in the door shown in Figure 10.

Fig .14 shows a perspective view of a support without an exterior profile and of a compensation means housed in the support, comprised in the door shown in Figure 10.

Fig. 15 shows a sectioned detailed view of compensation means comprised in the door shown in Figure 10.

Fig. 16 shows a perspective view of a moving element comprised in the compensating means shown in Figure 15.

Fig. 17 shows a perspective view of a second embodiment of the door according to the invention.

Fig. 18 shows an exploded view of a support comprised in the door shown in Figure 17.

Fig. 19 shows a sectioned detailed view of compensating means comprised in the door shown in Figure 17.

DETAILED DISCLOSURE OF THE INVENTION

[0014] The cooking appliance 1 according to the invention, shown in Figure 1, particularly a domestic oven, is adapted for low-pressure cooking, in other words for vacuum cooking at a controlled temperature, and comprises a cooking body 30 that delimits a first chamber 31 open at one end and adapted to house the food to be cooked, the cooking body 30 being adapted to withstand vacuum conditions in the first chamber 31, a casing 70 that houses the cooking body 30 in its interior, a door 75,115 adapted to close the first chamber 31, and vacuum means 10 arranged on the exterior of the cooking body 30, adapted to create the vacuum inside the first chamber 31.

[0015] The door 75,115 shown in detail in figures 10 to 19, comprises an exterior panel 95,117, an interior panel 96,116 that closes the first chamber 21, and supports 91,106 arranged attached to the exterior panel 95,117, with the interior panel 96,116 being arranged at least partially housed in the supports 91,106. The door 75,115 also comprises compensation means 100,105 coupled to the exterior panel 95,117 upon which the interior panel 96,116 rests, the compensation means 100,105 being adapted to move the interior panel 96,116 in relation to the supports 91,106 and ensure contact between the interior panel 96,116 and the sealing gasket 76, shown in detail in figure 9, along a closed contour, shown in figure 2, around the first chamber 31 delimited by the sealing gasket 76.

[0016] The cooking body 30, shown in detail in Figure 4, comprises a first body 20 open at one end the interior of which delimits the first chamber 31, and a second body 40 open at one end, the first body 20 being arranged housed inside the second body 40 in such a way that the second body 40 closes against the first body 20, the exterior of the first body 20 and the interior of the second body 40 delimiting a second chamber 32.

[0017] On the other hand, the first body 20 comprises communicating holes 23, shown in detail in Figure 5, which communicates the first chamber 31 to the second chamber 32, with the result that the first chamber 31 and the second chamber 32 are subjected to the same pressure. The communication holes 23 have a minimum diameter, enough to allow the passage of air between the first chamber 31 and the second chamber 32. In the embodiment shown, the communication holes 23 correspond with the fixing holes of lateral guides 80, shown in Figures 1 to 4, arranged to support trays not shown in the figures. In other embodiments not shown in the figures, both types of holes may not coincide.

[0018] The first body 20, shown in detail in Figure 5, comprises a substantially rectangular first part 21 with a cross-section, delimited by substantially flat lateral walls 22, and a substantially concave second part 24, delimited by a end wall 25, with the result that the lateral walls 22 along with the end wall 25, delimit the first chamber 31. The first part 21 is fixed to the second part 24 by means of welding, although they may be connected by any other known means.

[0019] Additionally, the second body 40 may be made of a single piece, although it preferably comprises two substantially symmetrical casings 41,42, each one of which is substantially vaulted, and a front plate 43. Each casing 41,42, shown in detail in Figures 6 and 7, includes a respective perimeter lateral rim 41 a, 42a through which the casings 41,42 are attached to each other by means of welding or other known fixing means, and a respective perimeter front rim 41 b,42b, through which both casings 41,42 are fixed to the front plate 43.

[0020] The front plate 43, shown in detail in Figures 3,4,7 to 9, has a geometry adapted to withstand the vacuum pressure, which reduces the deformation of said front plate 43 towards the interior of the second chamber 32 due to the effect of said vacuum, and includes a first part 43a, substantially flat, that is arranged fixed to the front rim 41 b, 42b by known fixing methods such as welding, screws, etc., a substantially flat second part 43b adapted to close the second chamber 32 closing against the first body 20 by means of a sealing gasket 76, shown in Figure 9; and an intermediate part 43c, substantially curved towards the exterior of the second chamber 32, said intermediate part 43c being continuous to the first part 43a and the second part 43b.

[0021] The sealing gasket 76 comprises a first part 76a adapted to seal the second chamber 32 and a second part 76b continuous to said first part 76a and adapted to seal the closure of the door 75,115 against the first chamber 31.

[0022] The first part 76a has higher rigidity than the second part 76b, given that it has to withstand the vacuum conditions in the resistant body 30. Also, the second part 76b has been adapted to absorb most of the deformations affecting the sealing gasket 76 when the vacuum is produced.

[0023] The sealing gasket 76 is arranged attached to the cooking body 30, in contact with the first body 20 and the second body 40. The sealing gasket 76 comprises a slot 79, arranged in the first part 76a, that extends substantially longitudinal along the sealing gasket 76 and into which the perimeter rim 21 b of the first body 21 is arranged inserted. On the other side, the first part 76a comprises an extension 80 substantially parallel to the slot 79, with both the slot 79 and the extension 80 sharing a first common surface 80a. The extension 80 is arranged inserted in a housing 82 delimited between the perimeter rim 21 b of the first body 21 and the front plate 43, in contact with the first body 20 through the first surface 80a and with the second body 20 through a second surface 80b substantially parallel to the first surface 79b.

[0024] The first part 76a includes, continuous to the second surface 80b, a third curved surface 80c, which substantially adapts to the curved geometry of the front plate 43, so that under vacuum conditions the sealing gasket 76 closes the second chamber 32 through the first surface 80a, the second surface 80b and third surface 80c of the sealing gasket 76.

[0025] Furthermore, the sealing gasket 76 comprises protrusions 81 which substantially extend orthogonally and are spaced from each other, from the second surface 80b and the third surface 80c, which improve the adherence of the sealing gasket 76 to the second body 40.

[0026] The sealing gasket 76 is arranged attached to the exterior casing 70 of the vacuum cooking device 1, comprising the sealing gasket 76 a recess 80d opposite to the extension 80 and continuous from the third surface 80c, which is arranged adjusted to one end of the casing 70.

[0027] On the other hand, the second part 76b of the sealing gasket 76 comprises a cavity 77 substantially longitudinal which deforms against the cooking body 30 under vacuum conditions of said cooking body 30. The cavity 77 is defined by a closed contour, delimited by a first surface 77a substantially flat and a second curved surface 77b which absorbs most of the deformations. The first surface 77a is substantially parallel to the slot 79 in the first part 76a. Furthermore, the second part 76b extends beyond the first body 20 such that it enters into contact, along the whole length of the closed contour delimited by sealing gasket 76, with the interior panel 96,116 of the door 75,115 before said door 75,115 is fully closed. To do so, the second part 76b cooperates with the compensation means 100,105 of the door 75,115, ensuring contact between the door 75,115 and the first body 20 along the length of the closed contour delimited by the sealing gasket 76 before closing fully.

[0028] Once the vacuum means 10 start to produce a vacuum, the second part 76b totally deforms sealing the door 75,115 against the first part 76a that withstands the vacuum. Thereby, the vacuum means 10 can optimally create a total vacuum in the first chamber 31.

[0029] In a preferred embodiment, the second part 76b comprises a tongue 78 which extends from the end of the second part 76b and which cooperates with the compensation means 100,105 of the door 75,115, improving contact between the door and the first body 20 along the length of the closed contour before the door 75,115 closes fully.

[0030] The sealing gasket 76 is made of an elastic deformable and non-porous material, preferably silicone.

[0031] On the other side, in the second body 40 in order to ensure that the joints between the casings 41,42 and the front plate 43 are sealed tight, each lateral rim 41 a, 42a includes a respective indentation 44a,44b, shown in detail in Figure 7, with the result that when the casings 41,42 are fixed to each other, the indentations 44a,44b that are arranged facing each other define a perimeter housing 44 wherein an insulating gasket 47 that seals the joint is tightly arranged. Furthermore, the front plate 43 includes a indentation 43d, arranged between the first part 43a and the second part 43b, shown in Figure 8, with the result that when the front plate 43 is fixed to the casings 41,42, the gap 43d defines along with the front rim 41 b,42b, a housing 46 wherein an insulating gasket 47 is tightly arranged sealing the joint between the front plate 43 and the casings 41,42.

[0032] In other embodiments not shown in the figures, the indentation 43d may be comprised on the front rim 41 b,42b of the casing 41,42 instead of on the front plate 43.

[0033] The first body 20 is arranged fixed to the second body 40 at discrete contact points, with the result that the direct contact surface is minimal, the purpose being to reduce the transmission of heat between both bodies 20,40, which is also achieved by means of the sealing gasket 76 arranged between both bodies 20,40. In the

embodiment shown in the figures, the discrete contact points are arranged in the corners of a perimeter rim 21 b comprised in the first body 20, as a result of which said perimeter rim 21 b includes, in each corner, a hole 21 d through which it is fixed to the second part 43b of the front plate 43 of the second body 40 by means of screws.

[0034] On the other hand, the first body 20 projects out in relation to the second body 40, due to the shape of the front plate 43 of said second body 40, the door 75, 115 shown in Figure 1, closing against the sealing gasket 76 arranged between both bodies 20,40, shown in Figures 1 to 5 and 9, delimiting the first chamber 31.

[0035] In figures 10 to 16 a first embodiment of the door 75 is shown, comprising two supports 91, substantially elongated, arranged substantially parallel to each other, each one of which houses an end of the interior panel 96. Each support 91 comprises a metallic profile 92 which is arranged fixed to the exterior panel 95, a hinge 98, known in the state of the art, which is arranged housed in the interior of the profile 92 and through which the door 75 is coupled to the cooking body 30, and lids 93,94 each one of them is arranged coupled to one end of the profile 92.

[0036] The compensation means 100 in the first embodiment of the door 75 move the interior panel 96 substantially parallel to the exterior panel 95, said compensation means 100 comprising a fixed element 102 at each end of the profile 92, with the fixed element 102 coupled to the exterior panel 95, a mobile element 101 upon which rests the interior panel 96, the mobile element 101 housed at least partially inside the fixed element 102 extending from the profile 92 through an opening 92c shown in figures 12 and 13, and an elastic element 103 provided between the fixed element 102 and the moving element 101, adapted to move the moving element 101 in relation to the fixed element 102. The fixed element 102 has a substantially rectangular section, and is housed inside the profile 92, attached to profile 92 by means of a tongue and groove joint 104, although in other embodiments it can be attached to the profile 92 via other types of joint. The moving element 101 comprises a surface 101 a substantially flat on which the interior panel 96 rests. The elastic element 103 is preferably a compression spring, although in other embodiments it may comprise another type of elastic element.

[0037] The fixed element 102 comprises a housing 102c, open at one end, which partially houses the elastic element 103 and the moving element 101. The moving element 101, shown in figures 15 and 16, comprises an interior housing 101 d, substantially cylindrical, which houses the elastic element 103. Also, the moving element 101 comprises flanges 101 b which extend substantially orthogonally in the direction of travel of the moving element 101 from two lateral surfaces 101e substantially parallel to each other, with each flange 101 b cooperating with a slot 102b, shown in figures 14 and 15, comprising the fixed element 102, with each slot 102b extending longitudinally. On the other hand, each slot 102b is open at one end, and includes a stop 102d at the opposite end. Thereby, each stop 102d cooperates with the corresponding flange 101 b limiting the maximum travel of the moving element 101 in relation to the fixed element 102 to avoid the accidental disassembly of the compensation means 100.

[0038] On the other hand, the compensation means 100 comprises guide means 120 which guide the travel of the moving element 101 in relation to the fixed element 102. The guide means 120, shown in figure 15, include a first, substantially flat, guide surface 101c, comprised in the moving element 101 which cooperates with a second, substantially flat, guide surface 92d, included in the profile 92 of the support 91. Both guide surfaces 101 c, 92d are substantially orthogonal to the direction of travel of the moving element 101.

[0039] Lastly, the profile 92of the support 91 comprises a flange 92b which extends substantially orthogonally to the profile 92 towards the interior of said longitudinal section 92, and which limits the displacement of the interior panel 96 in relation to the support 91 and therefore, in relation to the exterior panel 95.

[0040] Figures 17 to 19 show a second embodiment of the door 115, which comprises two metallic supports 106, substantially lengthened, arranged substantially parallel to each other, each of which houses one end of the interior panel 96. Each support 106, shown in detail figure 18, comprises a base 108 that is attached to the exterior panel 95, a hinge 109, known in the state of the art that is housed in the base 108 and through which the door 115 is joined to the cooking body 30, and a cover 107 coupled to the base 108, covering said base 108.

[0041] The compensation means 105 in the second embodiment of the door 115, shown in detail in figure 19, move the interior panel 116 substantially parallel to the exterior panel 117, said compensation measures 105 comprising a fixed element coupled to the exterior panel 95, a moving element 112 upon which rests the interior panel 96, the mobile element 112 arranging housed at least partially inside the fixed element 110, and an elastic element 111 arranged between the fixed element 110 and the moving element 112, adapted to move the moving element 112 in relation to the fixed element 110. The fixed element 110 is substantially cylindrical and comprises a first component 110a having a housing 110c, substantially cylindrical, concentric and open at one end, wherein the elastic element 111 is partially housed, and a second component 110b, substantially cylindrical and open at one end, that houses the first component 110a in its interior, with both components 101a, 110b attached to each other integrating the fixed element 101. The second component 110b comprises a concentric orifice 110d that is passed through by the moving element 112.

[0042] The moving element 112 of the substantially cylindrical section has a surface 112a which is substantially flat on which rests the interior panel 96, a perimeter rim 112b, with a diameter greater than the orifice 110d, adapted to act as a stop against the second component

101b of the fixed element 110 avoiding the accidental disassembly of the compensation means 105. The elastic element 111 is preferably a compression spring although in other embodiments it can be any other type of elastic element.

[0043] On the other hand, the compensation means 105 comprises guide means 121 for the displacement of the moving element 112. The guide means 121 comprises in the moving element 112, the rim 112b and an exterior substantially cylindrical surface 112c, and in the fixed element 110, a substantially cylindrical interior surface 110e, which delimits the housing 110c of the first component 110a and the orifice 110d, with the cooperation on one side of the edge 112b against the interior surface 110e and on the other side, the exterior surface 112c of the moving element 112 against the orifice contour 110d of the fixed element 110.

[0044] Finally, the cover 107 of the support 106 comprises a protrusion 107b which limits the displacement of the interior panel 116, and therefore of the moving element 112, in relation to the support 106 and therefore, in relation to the exterior panel 117.

[0045] In the embodiments shown in figures 10 to 19, the compensation means 100,105 are diagonally positioned in relation to each other, next to each vertex of the interior panel 96,116. In other embodiments, not shown, the number of compensation means 100,105 can exceed or be less than four.

[0046] In the embodiments shown in figures 10 to 19, the exterior panel 95,117 and the interior panel 96,116 are made of glass. The exterior panel 95,117 has a thickness of about 4 mm. The interior panel 96,116 has a thickness greater than that of the exterior panel 95,117 given that the interior panel 96,116 has to withstand the vacuum of the cooking device 1, the thickness of the interior panel 96,116 being of about 10 mm. In other embodiments, not represented, the interior panel 96,116 can be made of self-heating glass which avoids condensation formed during vacuum cooking on the self-heating glass, improving visibility of the interior of the first chamber 31.

[0047] On the other hand, the vacuum means 10, shown in Figure 1, comprise a vacuum pump 11 that is housed inside the casing 70; a filling conduit 16 connected to the second chamber 32, adapted to supply air to the interior of said second chamber 32; a vacuum conduit 12 that communicates the vacuum pump 11 to the second chamber 32, adapted to extract air from the interior of said second chamber 32, at least one electric valve, not shown in the figures, and which regulates the filling or emptying of the second chamber, and at least one pressure sensor 13, preferably differential, that measures the difference in pressure between the interior of the second body 40 and the exterior of the cooking appliance 1.

[0048] The second body 40 comprises in one of the casings 41,42 an opening 45 arranged on a substantially flat surface corresponding to the back wall of the casings 41,42, shown in Figures 1, 4 and 7, wherein a tight connector 14, schematically shown in Figure 1, is housed through which the electrical connections are inserted in the interior of the cooking body 30 without breaking the vacuum. In addition, the vacuum conduit 12 and the filling conduit 16 are arranged connected to the second body 40 in a sealed manner and communicated with the second chamber 32.

[0049] Considering that the first chamber 31 and the second chamber 32 are communicated to each other, and are therefore subjected to the same pressure, it is the second body 40, and not the first body 20, which must withstand the vacuum conditions. A cooking body 30 is thus obtained having an optimised first chamber 31, in other words it allows the volume of the first chamber 31 to be maximised without this involving a considerable increase in the volume of the cooking body 30. The first body 20 is thus preferably made of stainless steel, although it may also be made of enamelled steel or any other material used in the cooking chambers of conventional ovens, and has a maximum thickness of approximately 0.6 mm. The second body 40 is made of a material that withstands the vacuum conditions, humidity and temperature to which it is subjected during cooking. In the embodiment shown, said second body 40 is made of galvanised steel and has a thickness of between, approximately, 1.5 mm and, approximately, 3,0 mm, the thickness preferably being between, approximately, 1.8 mm and, approximately, 2,0 mm. In other embodiments other materials able to withstand the requirements demanded to the second body 40 may be used, said materials being metallic, such as stainless steel for example, plastic or even ceramics.

[0050] The cooking appliance 1 also comprises flexible main heating means 50, shown in Figure 1, which are arranged in the second chamber 32, fixed to the exterior of the first body, and auxiliary heating means 54, shown in detail in Figure 2, which allow the food deposited in the first chamber 31 to be grilled. The main heating means 50 include resistive wires arranged between two layers of glass-fibre-reinforced silicon, these being suitably distributed in order to heat the first chamber 31 homogenously. In vacuum conditions, the heating means 50 heat the first body 20 substantially by conduction, the first body 20 radiating said heat uniformly towards the interior of the first chamber 31. In vacuum conditions, there is practically no convection.

[0051] In other embodiments not shown in the figures, the main heating means 50 may comprise at least one bottom sheet fixed to the exterior of the first body by means of an adhesive layer, at least one resistive wire, and at least one top sheet that covers the corresponding resistive wire, fixing it to the corresponding bottom sheet, the top sheet and the bottom sheet being flexible sheets preferably made of aluminium, which adapt perfectly to the exterior outline of the first body 20.

[0052] On the other side, the auxiliary heating means 54 allow the user to use the grilling option before, during or after vacuum cooking. The auxiliary heating means 54, shown in Figures 1 and 2, thus comprise at least one

ceramic heater 55 with a preferably concave shape for concentrating the radiation. In a preferred embodiment, the auxiliary heating means 54 comprise two ceramic heaters 55 arranged substantially parallel and fixed to one of the lateral surfaces 22 of the first body 20, preferably to an upper surface 22a.

[0053] The cooking appliance 1 also comprises heat-insulating means 35 that are arranged in the second chamber 32, substantially facing the corresponding heating means 50. The heat-insulating means 35 include at least one reflective sheet 36, preferably metallic, which is arranged fixed to the interior of the second body 40, with the result that part of the radiation emitted by the heating means 50 is reflected, by means of the reflective sheet 36, on said heating means 50, thereby ensuring the proper insulation of the first body 20 and, therefore, the optimum energy performance of the cooking appliance 1. The reflective sheet 36 is fixed to the interior of the second body 40, preferably, by means of an insulating material 37, preferably an injected foam, although in other embodiments not shown in the figures other known fixing means may be used.

[0054] Although in the embodiment shown in the figures the heating means 50 are resistive means, in other embodiments not shown in the figures the cooking appliance 1 may be a microwave oven, with the result that the heating means 50 comprise a magnetron that generates the microwaves and a conduit guiding said microwaves to the first cavity 31.

[0055] Finally, the cooking appliance 1 comprises support means 60 of the cooking body 30, shown in Figures 1 and 3, the support means 60 including front supports 61 arranged substantially parallel to each other, and rear supports 62, arranged substantially parallel to each other and fixed to one of the lateral rims 41 a of the second body 40, the weight being distributed between both the front supports 61 and rear supports 62.

[0056] The cooking body 30 is arranged fixed to the support means 60 at discrete contact points, with the result that the direct contact surface is minimal, the purpose being to reduce the transmission of heat between the cooking body 30 and said support means 60. The discrete contact points are arranged substantially in the corners of the front plate 43, as a result of which the first part 43a of the front plate 43 includes, substantially in each corner, a flap 39 that includes a hole 39b through which the cooking body 30 is screwed to the front supports 61 respectively. The front plate 43 also includes tabs 38, arranged on the sides of the first part 43a, each one of which is inserted in a corresponding groove 61 b arranged on each front support 61.

[0057] Finally, the support means 60 also include lateral supports 63 that fix front supports 61 and the rear supports 62 transversally to each other.

Claims

1. Door adapted to close a cooking chamber (31) comprised in a cooking body (30) of a cooking device (1) for low pressure cooking, the door (75,115) comprising an exterior panel (95,117), an interior panel (96,116), and at least one support (91,106) attached to the exterior panel (95,117) in which at least partially the interior panel (96,116) is housed, **characterised in that** it comprises compensation means (100,105) coupled to the exterior panel (95,117), upon which rests the interior panel (96,116), the compensation means (100,105) being adapted to move the interior panel (96,116) in relation to the support (91,106) and ensure contact between the interior panel (96,116) along a closed contour, against a sealing gasket (76) attached to the cooking body (30).

2. Door according to previous claim, wherein the compensation means (100,105) move the exterior panel (95,117) substantially parallel to the interior panel (96,116).

3. Door according to any of the previous claims, wherein the compensation means (100,105) comprises at least one fixed element (102,110) coupled to the exterior panel (95,117), a moving element (101,112) partially housed inside the fixed element (102,110) and upon which rests the interior panel (96,116), and at least one elastic element (103,111) arranged between the fixed element (102,110) and the moving element (101,112) and adapted to move the moving element (101,112) in relation to the fixed element (102,110).

4. Door according to the previous claim, wherein the moving element (101,112) comprises at least one flange (101b,112b) which cooperates with a corresponding stop (102d, 110b) comprised in the fixed element (102,110) which limits the maximum displacement of the moving element (101,112) in relation to the fixed element (102,110).

5. Door according to claims 3 or 4, wherein each support (91,106) comprises a protrusion (92b, 107b) upon which the interior panel (96,116) stops, limiting the maximum displacement of the moving element (101,112) in relation to the fixed element (102,110).

6. Door according to any claim 3 to 5, wherein the moving element (101,112) comprises a housing (101d, 112d) wherein the elastic element (103,111) is housed at least partially.

7. Door according to any claim 3 to 6, wherein the compensation means (100,105) comprises a guide means (120,121) for moving the moving element

(101,112).

8. Door according to the previous claim, wherein the guide means (120) comprises at least a first substantially flat guide surface (101 c) on the moving element (101) which cooperates during its displacement with a second substantially flat guide surface (92d) of the support (92), with both guide surfaces (101c,92d) arranged substantially orthogonal to the direction of displacement of the moving element (101).

9. Door according to claim 7, wherein the guide means (121) comprises in the fixed element (110) at least one substantially cylindrical surface (110d, 110e) which cooperates during the displacement with at least one substantially cylindrical surface (112e, 112b) of the moving element (112).

10. Door according to claims 3 or 9, wherein the elastic element (103,111) is a compression spring.

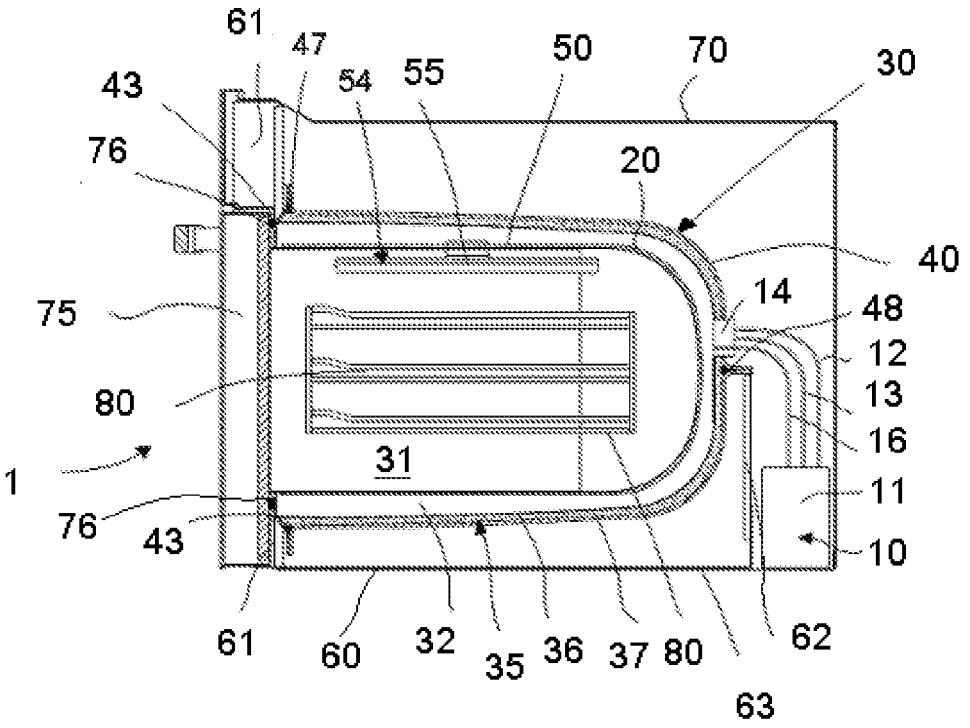
11. Door according to any claim 3 to 10, wherein the fixed element (110) is arranged fixed to the exterior panel.

12. Door according to any claim 3 to 10, wherein the fixed element (102) is arranged fixed to the support (91).

13. Door according to any of the previous claims, wherein the compensation means (100,105) are diagonally positioned in relation to each other.

14. Door according to the previous claim, wherein the compensation means (100,105) are next to each vertex of the interior panel (96,116).

15. Cooking device adapted for low pressure cooking that comprises a door (75,115) according to any of the previous claims.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50
70
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76
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75
14
48
12
13
80
16
31
1
11
76
43
10
61
60
32
35
36
37
80
62
63

FIG. 1

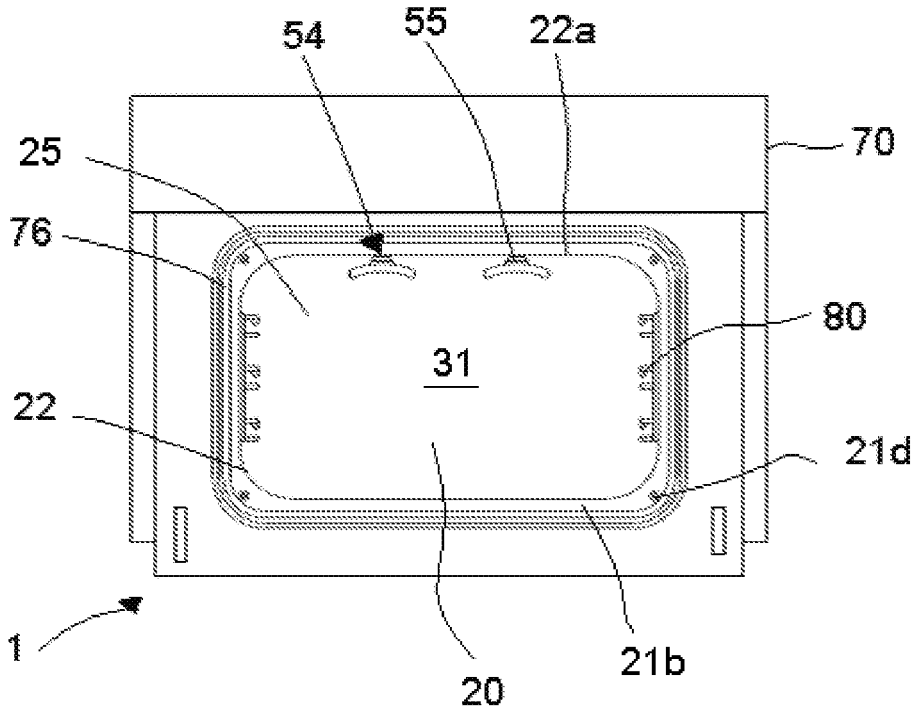

54
55
22a
70
25
76
80
31
22
21d
1
20
21b

FIG. 2

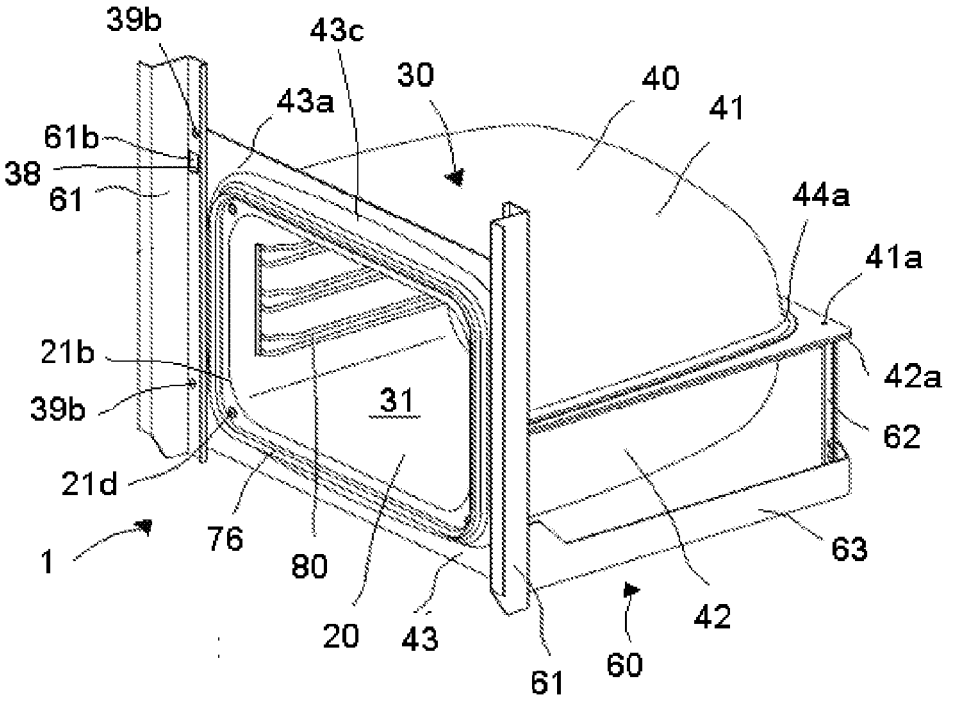
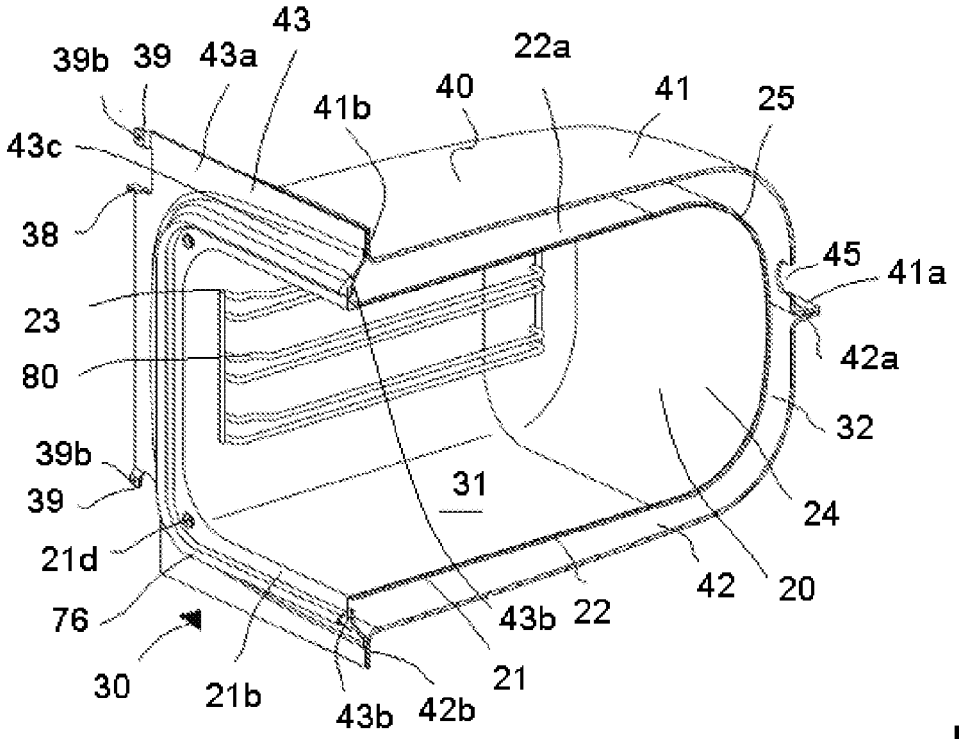

39b
43c
30
40
41
43a
61b
38
61
44a
41a
21b
42a
39b
31
62
21d
76
80
63
1
20
43
42
61
60

FIG. 3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39b
39
43a
22a
41b
40
41
25
43c
38
45
41a
23
42a
80
32
39b
31
39
24
21d
42
20
76
43b
22
30
21b
21
43b
42b

FI

G. 4

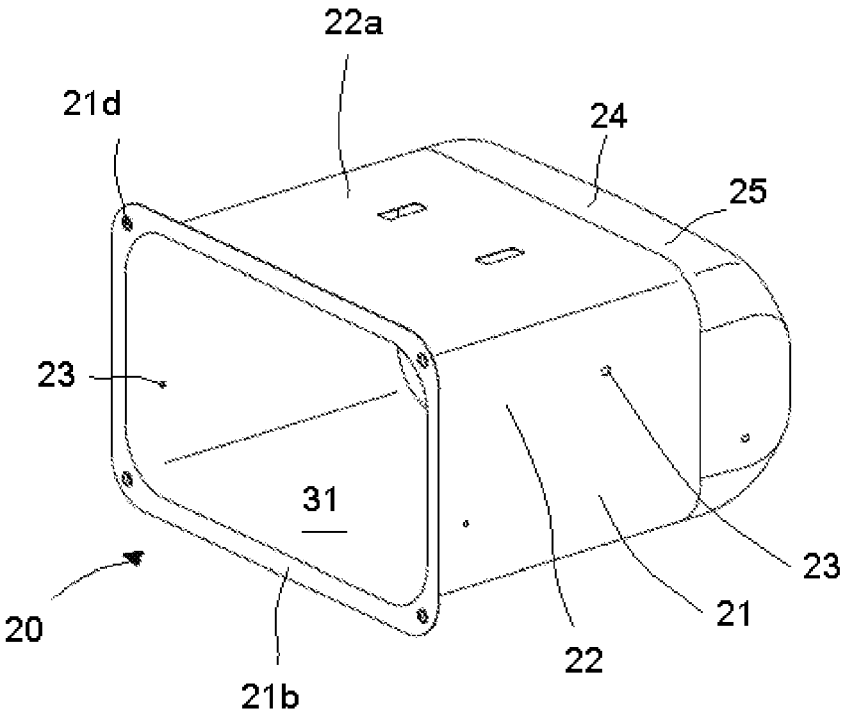


FIG. 5

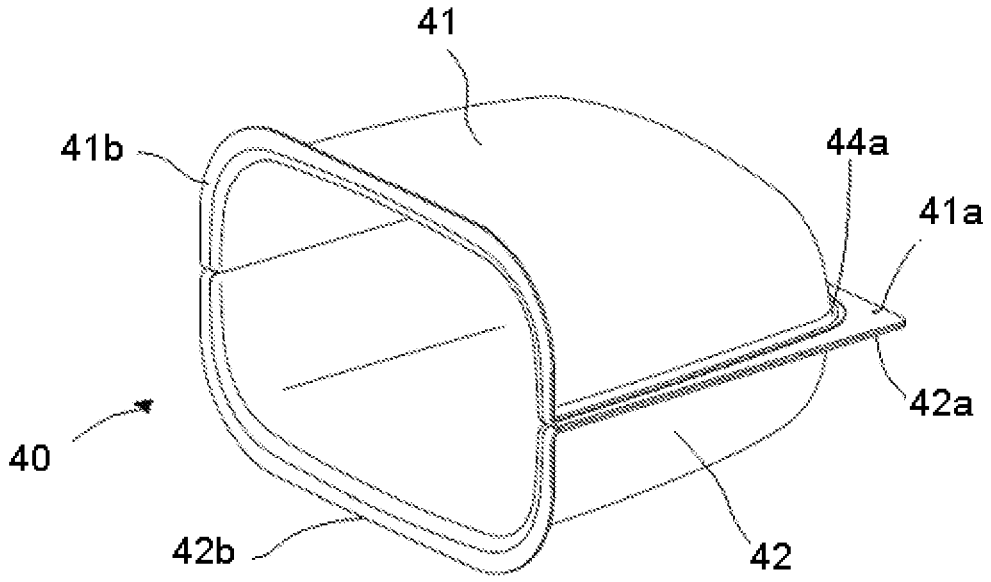


FIG. 6

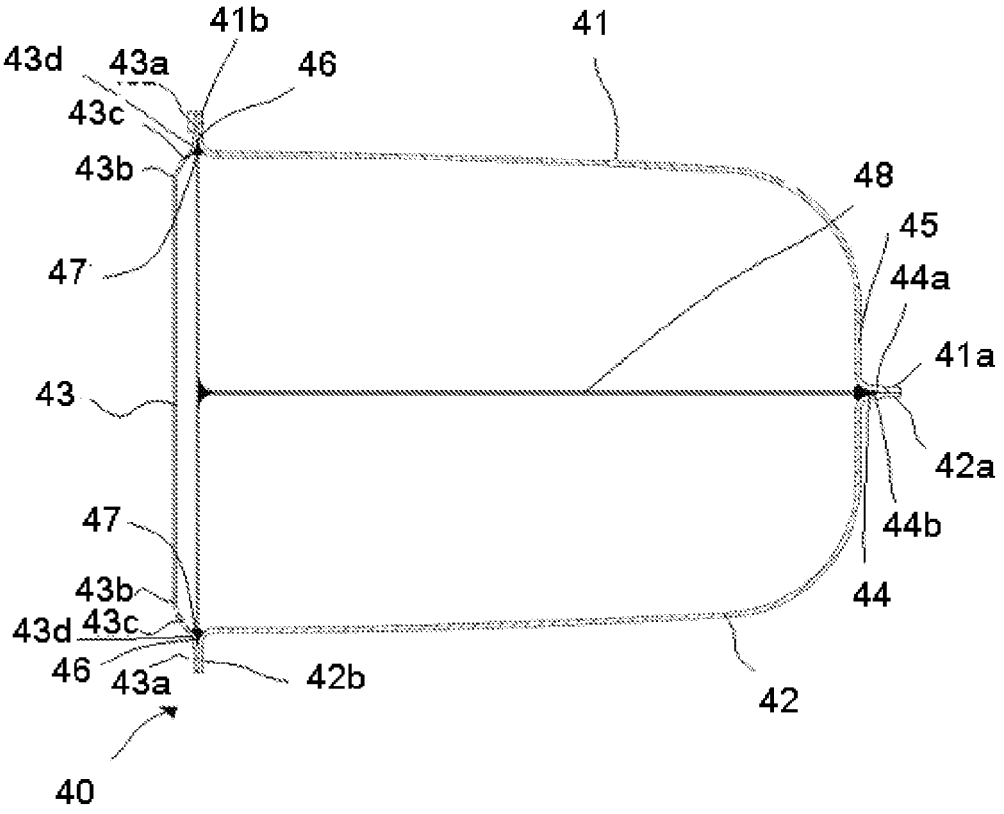
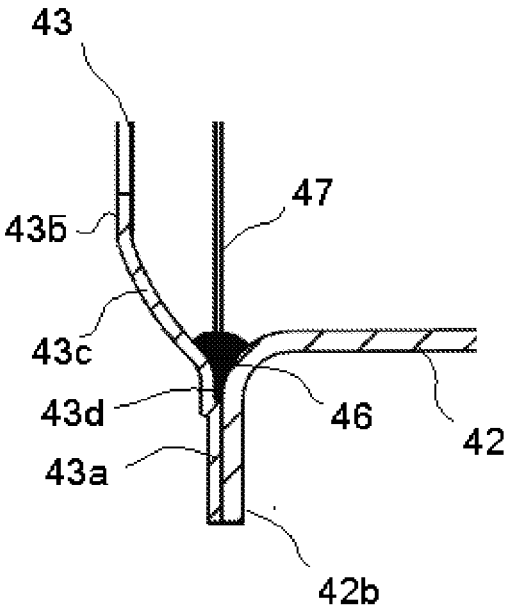

41b
41
43d
43a
46
43c
43b
48
45
47
44a
41a
43
42a
47
44b
43b
44
43d
43c
46
43a
42b
42
40

FIG. 7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43b
43c
43d
46
42
43a
42b

FIG. 8

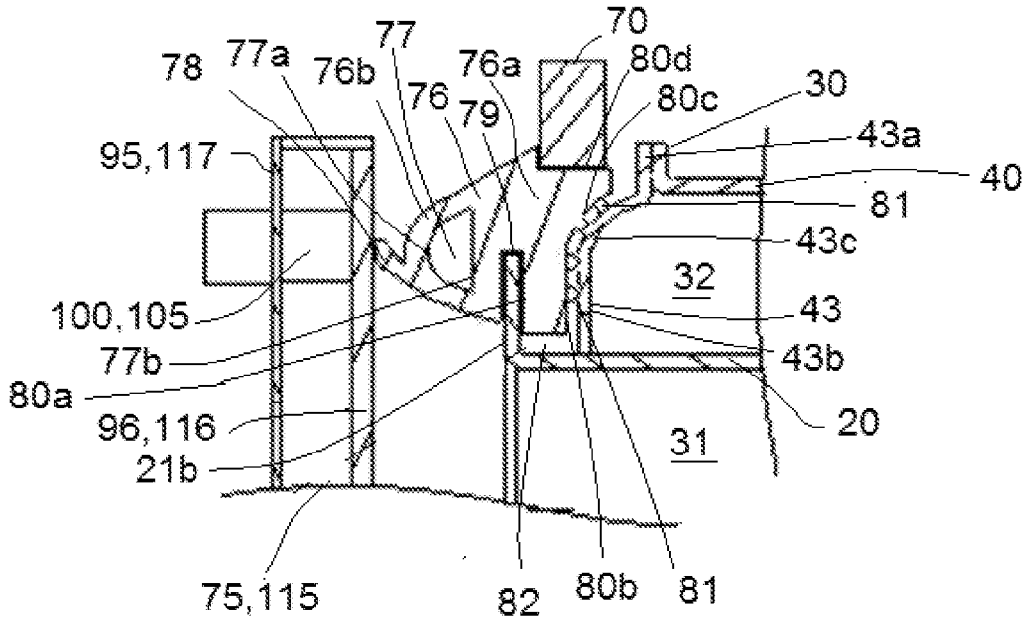


FIG. 9

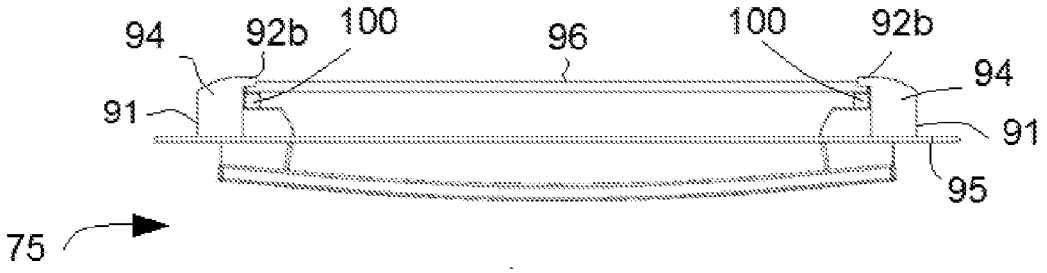


FIG. 10

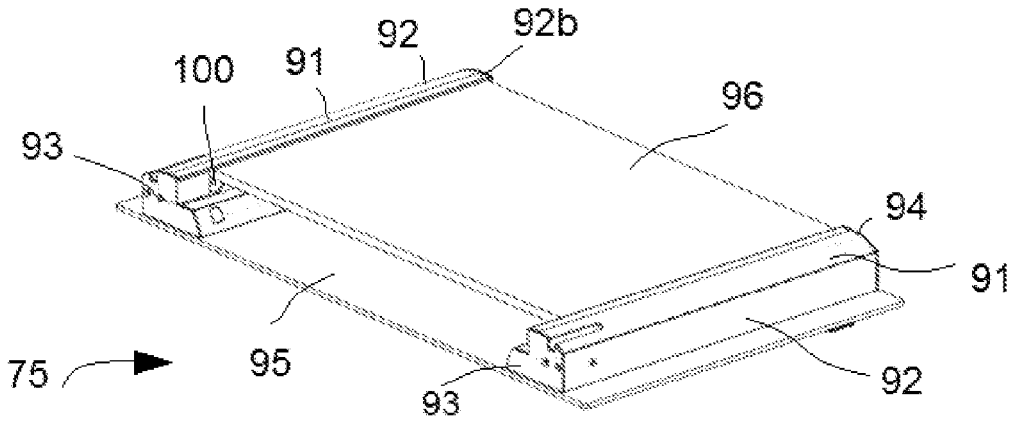


FIG. 11

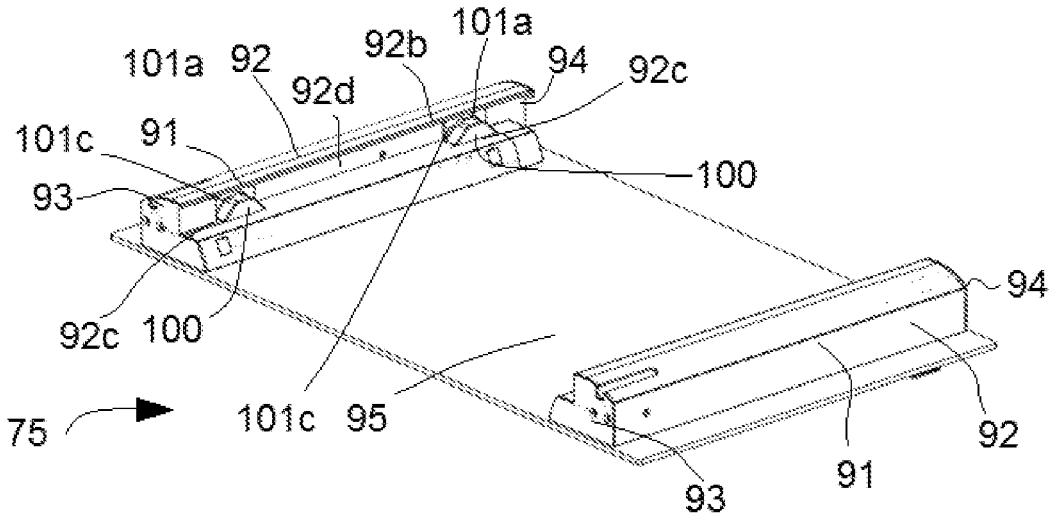
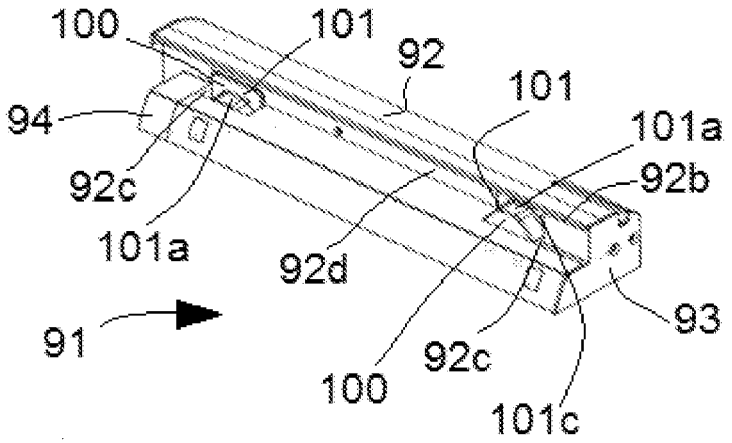

101a
92
92b
101a
94
92c
92d
101c
91
100
93
92c
100
94
75
101c
95
92
91
93

FIG. 12


100
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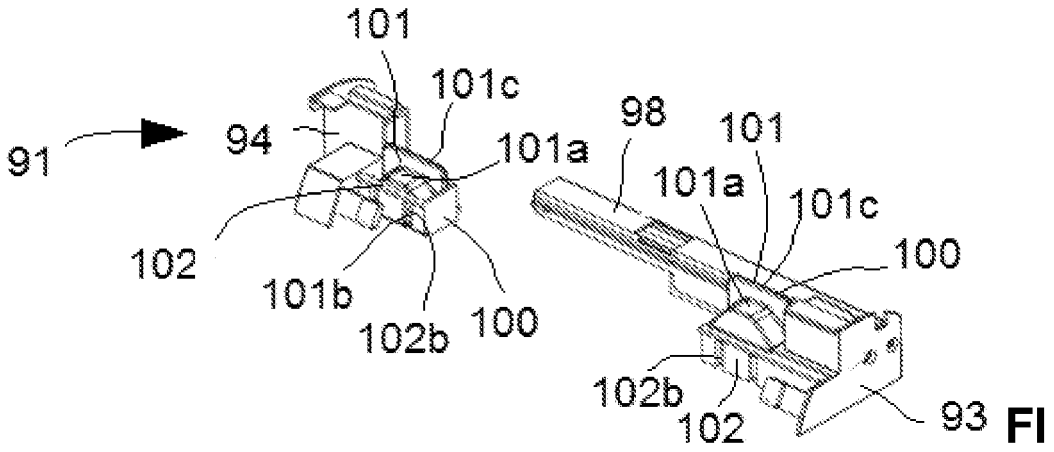
92
101
94
101a
92c
92b
101a
92d
93
91
92c
100
101c

FIG. 13


101
101c
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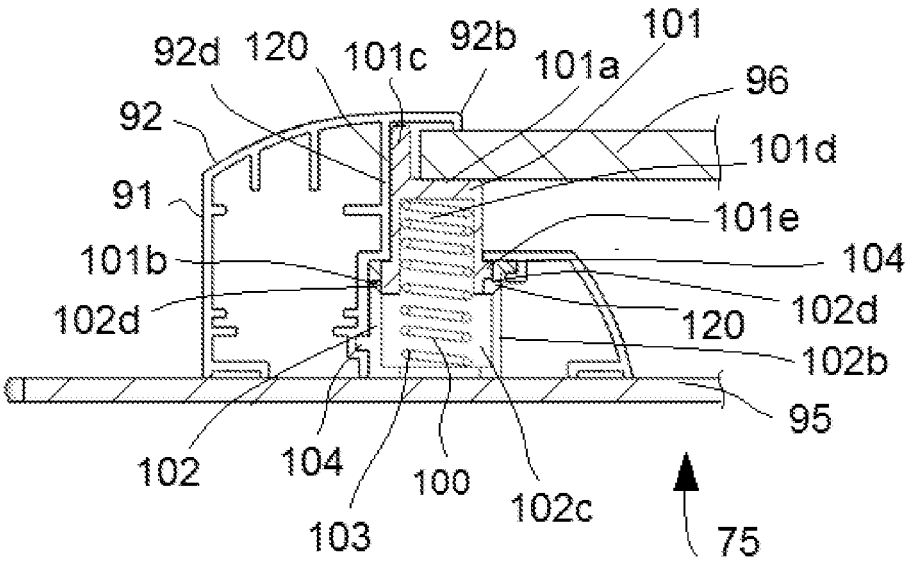
94
101a
98
101
101a
101c
100
102
101b
102b
100
102b
102
93

FI

G. 14


92d
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101c
92b
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101a
96
92
101d
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102d
102d
120
102b
95
102
104
100
102c
103
75

FIG. 15

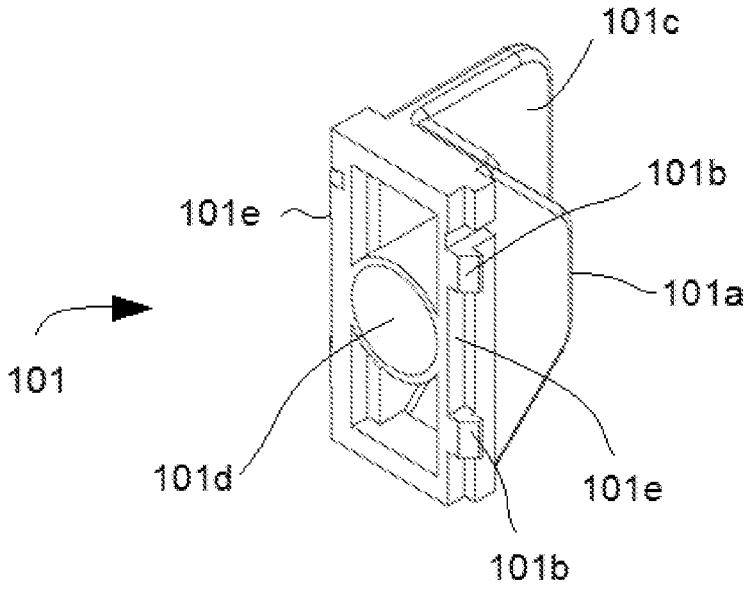
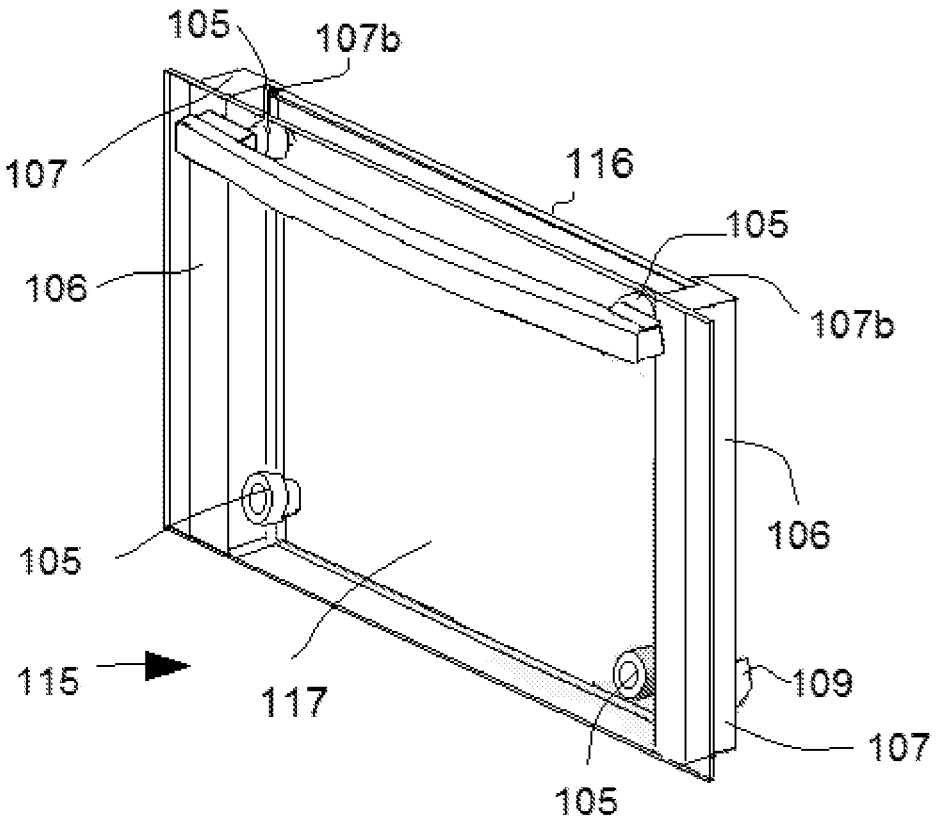

101c
101b
101e
101a
101
101d
101e
101b

FIG. 16


105
107b
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107b
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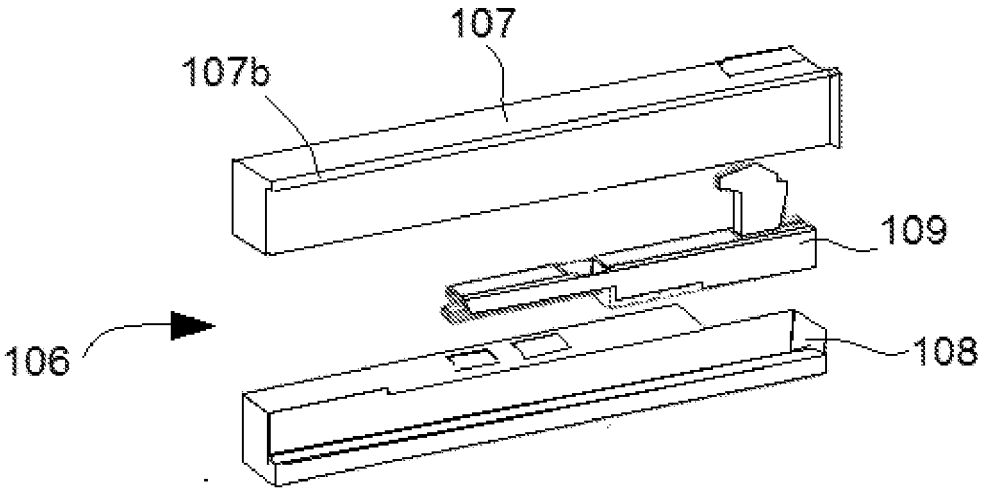
107
105

FIG. 17


107
107b
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106
108

FIG. 18

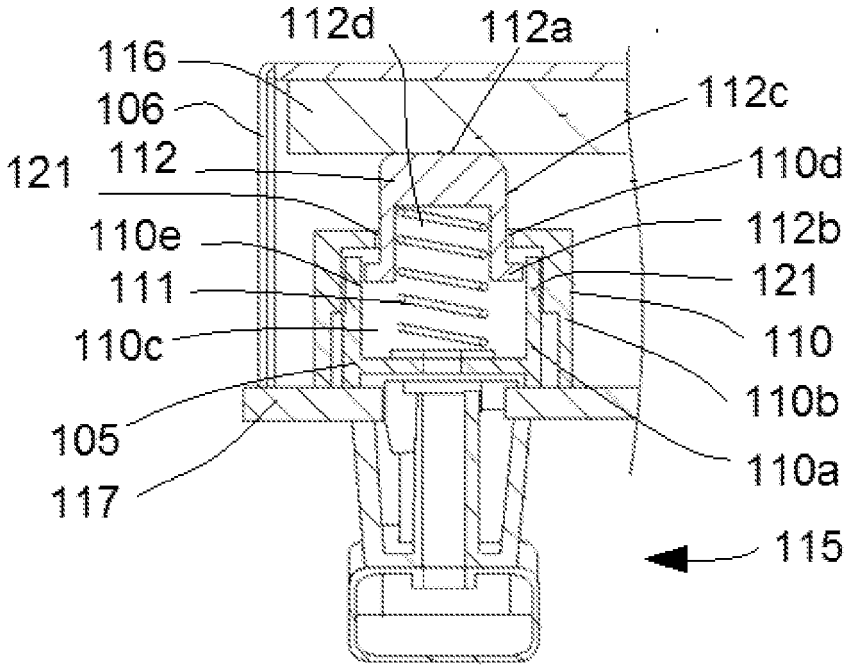
112d
112a
116
106
112c
121
112
110d
110e
112b
111
121
110c
110
110b
105
117
110a
115

FIG. 19

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EUROPEAN SEARCH REPORT

Application Number
EP 11 38 2189

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	GB 2 410 325 A (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 27 July 2005 (2005-07-27) * page 5, lines 8-11; figure 2 * -----	1,13-15	INV. F24C15/02
X	US 3 189 020 A (CLARENCE GETMAN) 15 June 1965 (1965-06-15) * column 1, lines 69-72; figures 1-5 * -----	1,2, 13-15	
X	DE 199 06 901 A1 (KUEPPERSBUSCH HAUSGERAETE AG [DE]) 24 August 2000 (2000-08-24) * figure 2 * -----	1,13-15	

TECHNICAL FIELDS SEARCHED (IPC)

F24C
A47J
H05B
F27B
A23L
B01J
B65D
F24B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 November 2011	Adant, Vincent

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1

EPO FORM 1503 03.82 (P04C01)

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15-11-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2410325 A	27-07-2005	DE 102004003120 A1	18-08-2005
US 3189020 A	15-06-1965	NONE	
DE 19906901 A1	24-08-2000	NONE	

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

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Patent documents cited in the description

- EP 717917 B1 **[0003]**
- JP 2008175421 A **[0004]**
- EP 1783433 A1 **[0005]**