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(72) Inventor: **Gilroy, William George**
Solihull, West Midlands B93 9ES (GB)

(74) Representative: **Tranter, Andrew David**
Barker Bretell LLP
138 Hagley Road
Edgbaston
Birmingham B16 9PW (GB)

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(71) Applicant: **Aga Consumer Products Limited**
Shirley
Solihull,
B90 4LH (GB)

(54) **A cooking appliance**

(57) A cooking appliance (100) comprises: a housing (101) which houses a main oven cavity, the main oven cavity (104) including at least two heat sources, and a removable partition (120) which can be located within the main oven cavity so that it is divided it into two separate ovens (130,140), one of the heat sources being associated with a first one of the ovens and the other heat source with a second one of the ovens, and which can be removed from the main oven cavity to leave a single, larger oven, and control means for controlling the heat sources

such that with the removable partition removed both heat sources are operated simultaneously to heat the single larger oven and with the removable partition (120) in place the control means controls the heats sources such that only one of the two separate ovens is heated. The control means may be responsive to the position of the partition so that only the one heat source is operated if the partition is in position as a divider. The appliance can be used as one large oven, or divided to form one smaller oven with only the smaller oven being heated.

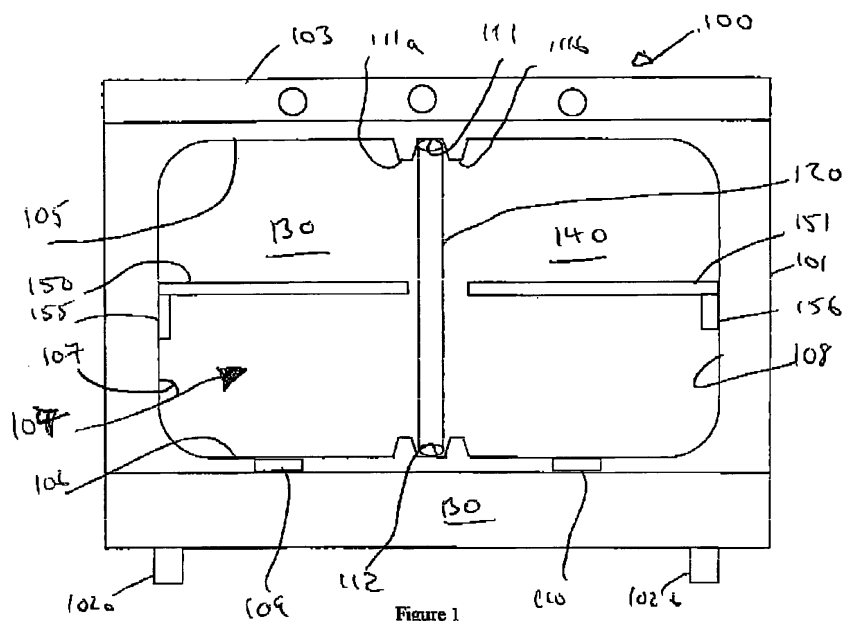


Figure 1

Description

[0001] This invention relates to improvements in cooking appliances, and particularly but not exclusively to domestic cooking appliances that include at least one oven.

[0002] Most households have within their kitchens cooking appliances which comprise a housing, typically 60cm or 90cm wide, which can be readily integrated into a row of fitted kitchen units such as storage cupboards and drawer sets or fitted into a chimney alcove. The housing may be designed as a free standing unit, with the top face of the housing having a height that matches that of an adjacent work surface. Alternatively it may be a built in unit that is slightly lower in height and is intended to be slotted below a run of continuous work surface. In the former case the housing will support a hob comprising an array of electric heating elements (perhaps inductive or halogen units) or gas burners on its upper surface. In the later case the upper surface will be hidden and a separate hob is needed.

[0003] The housing will typically contain either a single oven, which will usually span the whole width of the housing, or two or smaller oven cavities. Where two ovens are provided, they may be located one above the other or side by side. Each of the ovens is formed by a cavity defined by upper and lower walls, side walls and a rear wall. The walls are usually insulated around the cavity so that heat is retained in the cavity. Each cavity is then heated by a respective heat source such as an electric element or a gas burner. Within each cavity are shelves, sometimes removable for cleaning, on which items to be cooked can be placed.

[0004] Whether a consumer chooses a single oven cooking appliance or a twin oven appliance depends on the type of cooking they are likely to do. If a cook wants to cook large items such as turkeys or large cakes a single oven may be needed. This comes at the cost of less flexibility than the twin oven appliances for times when only small items are to be cooked. Heating a large oven for a small amount of food could be seen as wasteful of energy. On the other hand, if a twin oven appliance is chosen then it may not be possible to cook larger items that cannot be fitted into one of the smaller ovens.

[0005] According to a first aspect the invention provides a cooking appliance comprising a housing which houses a main oven cavity, the main oven cavity including at least two heat sources, and a removable partition which can be located within the main oven cavity so that it is divided into two separate ovens, one of the heat sources being associated with a first one of the ovens and the other heat source with a second one of the ovens, and which can be removed from the main oven cavity to leave a single, larger oven, and control means for controlling the heat sources such that with the removable partition removed both heat sources are operated simultaneously to heat the single larger oven and with the removable partition in place the control means controls the heat sources such that only one of the two separate

ovens is heated.

[0006] Providing an oven cavity and a removable divider allows a cook to choose exactly how large an oven they need for an item or items to be cooked. For smaller items, the oven cavity can be divided and only one of the ovens heated. For larger items it can be removed to allow the cavity to be used as one large oven with both heat sources working together.

[0007] The control means may operate the heat sources responsive to the position of the partition.

[0008] The control means may be arranged so that the ovens when divided can be controlled independently one could be set at a lower temperature than the other giving greater flexibility. The invention therefore gives a cook the advantages of both single oven and twin oven cooking appliances.

[0009] To enable the control means to be responsive to the position of the partition the cooking appliance may include a switch means which is operated automatically when the divider partition is in position to divide the main oven in two, the control means controlling operation of the heat sources as a function of the position of the switch means. This switch means may comprise a micro switch which is engaged by the partition when in position.

[0010] By providing a switch means the user does not need to operate the control means to turn off one of the heat sources when the partition is inserted as the control means will do this automatically by sensing the position of the partition.

[0011] Instead of a switch a sensor may be provided. For instance, a light source may be located on one side of the partition (when fitted) and a light sensitive detector on the other which is responsive to light from the source. The output of the sensor will be passed to the control means and will vary depending on whether the partition is installed or removed.

[0012] The main oven cavity may be generally rectangular. The divider may be located in the middle of the main cavity to split it into two identical sized ovens when it is located.

[0013] The divider may comprise two layers of material separated by an insulating layer, optionally of thermally insulating material. The divider may therefore be solid to substantially isolate one oven from the other when in place. The two layers may be glass and the insulating layer may comprise a vacuum formed between the layers.

[0014] The divider may locate in grooves located at the top and bottom of the main cavity. It may therefore be a vertical partition dividing the main oven into left and right smaller ovens. When the partition is inserted (as detected by the switch means where provided) only the heat source of the right hand oven may operate.

[0015] The grooves may include a thermally insulating seal. Alternatively the seal may be provided on the top and bottom edges of the divider. The seal may perhaps not always be needed. For example by suitable arrangement of baffles a labyrinth type seal can be achieved.

[0016] The cooking appliance may be provided with a single door that covers the whole of the open front of the main cavity. Alternatively, it may be provided with two doors that open separately or can be joined as one. Each door may be sized and located such that it can cover the opening of a respective one of the ovens formed by the divider when splitting the main cavity. An interlock mechanism may be provided that enables the two doors to be locked together to function as one door when the divider is removed.

[0017] The main oven cavity may accommodate at least one shelf that is supported by an end wall of the main cavity and extending generally horizontally towards the divider.

[0018] The shelf may be supported only at its end that is closest to the end wall and extend outwards from it as a cantilever.

[0019] The shelf may, optionally, also be supported by the rear wall of the main oven cavity, and when the divider is installed may be supported by resting on a ledge or in a groove in the divider. In this case it is preferred that it only sits on the base of the groove or on top of the ledge when the shelf is loaded so that when unloaded it allows unimpeded, friction free or low friction removal of divider.

[0020] The cooking appliance may include a user control circuit that electively operates the heat sources to control the temperature of the main oven or smaller divided oven. The control circuit may include a selector switch. This may be a rotary switch. This position of this switch may set the desired temperature of the oven, and the control means may operate the or each heat source to achieve this desired temperature in the oven.

[0021] The user control circuit may include separate controls for each of the divided ovens, with one of them being a master switch and the other a slave switch. When the partition is removed the control means may take the setting of the master switch as the temperature requested from both heat sources together, and may override the slave switch. This selector switch may be provided in addition to, or as an alternative to, the switch operated by the partition.

[0022] The default setting may be to heat only one heat source when the partition is in place. However, if a slave switch is provided the operation of that switch may override this default and cause the control means to heat both ovens to the temperatures set by the master switch and slave switch respectively.

[0023] The heat sources may comprise at least one electric heating element, or a gas burner suitable for burning natural gas or LPG or similar. The heat source may comprise two or more heat elements that may work together or independently. For instance a heat source for a divided oven may comprise an electric element in the top of the oven cavity, the outermost inner wall and the base.

[0024] The cooking appliance may be a built in appliance or a free standing. Most preferably it may have a width of substantially 90cm. A hob may be provided on

the top of the housing.

[0025] There will now be described, by way of example only, one embodiment of the present invention with reference to and as illustrated in the accompanying drawings of which:

Figure 1 is a front view of a cooking appliance according to the present invention with its front door removed for clarity;

Figure 2 is a top view, showing internal detail in dashed line, of the cooking appliance of Figure 1 to show detail of the oven cavity and divider;

Figure 3 is a view corresponding to Figure 1 showing the cooking appliance with its removable divider removed;

Figure 4 shows the door in position and closed; and

Figure 5 shows one part of the door open to provide access to an oven.

[0026] As shown in Figures 1 and 2 of the accompanying drawings, a cooking appliance 100 comprises a housing 101 that is supported above a floor by a set of adjustable height legs 102a, 102b. The housing 101 is a generally box shaped form made by bolting and slotting together a number of pressed steel panels to define a base, side walls and a rear wall. The top of the housing is closed off with a pre-assembled hob unit 103. This way, for example include 2 large and two small inductive heating elements and four control dials which operate suitable control and drive circuitry (not shown) located within the hob unit 103. The front of the housing 101 is generally open.

[0027] The housing 101 accommodates a main oven cavity 104 that is also constructed from pressed steel panels that define a top surface 105, a bottom surface 106 and two side walls 107, 108 of the cavity 104. The front of the cavity 104 is open and is aligned with the opening in the front of the housing 101. A seal (not shown) is provided around the front facing edges of the top, bottom and side panels. A door assembly (not shown in Figure 1 but included in Figures 4 and 5) is attached to the front of the housing 101 by two hinges 109, 110 along its lower edge. The door assembly is sufficiently wide that it completely covers the front of the main cavity 104 and co-operates with the seal to close off the cavity when the door is closed.

[0028] The top surface 105 of the cavity 104 is provided with a groove 111 that runs from the front to the back, approximately midway between the sides of the cavity 104. As shown the groove 111 is formed between a pair of parallel ridges 111a, 111b formed in the top surface that extend slightly downwards towards the bottom of the cavity. It could, in an alternative, be formed as a recess in the top surface 105 that would extend away from the

bottom of the cavity. A seal of silicon rubber is located within the groove 111.

[0029] A similar groove 112 is provided in the bottom surface of the cavity 104 that is positioned vertically below the groove in the top surface.

[0030] Located within the grooves 111, 112, as shown in Figure 1, is a removable divider panel 120. The height of the panel 120 is therefore substantially the same as the height of the main cavity 104 and the panel depth substantially matches the main cavity depth from front to back. The panel 120 of the illustrated embodiment comprises a double glazed pane formed from two layers of heat resistant glass separated by a vacuum. When installed in the grooves in the top surface and bottom surface of the main cavity the divider panels thermally splits the main cavity into two separate oven cavities 130, 140. Of course, some heat may be transferred from one side of the divider to the other, but for practical purposes one cavity can be at a high temperature whilst the other is at, or close to, ambient temperature.

[0031] The front and back edges of the panel 120 are provided with seals that cooperate with the back wall of the main cavity 104 and the door assembly respectively. Of course, if preferred the seals may instead be carried by the back wall and the door, perhaps located within grooves.

[0032] Figure 3 shows the cooking appliance 100 with the divider 120 removed. The cavity 104 forms a single large oven that enables large items to be cooked easily that would not have otherwise fitted into one of the smaller, divided ovens.

[0033] The main cavity includes two heat sources. One is positioned in the left hand side and the other the right so that with the partition in place each smaller oven cavity thereby formed has its own heat source. A switch is positioned on the rear wall of the oven. It is normally closed and is moved to an open position when the partition is inserted. This switch forms part of a control circuit for the heat sources. In the closed position the control circuit enables both heat sources so that they work together to heat the single large oven. When the partition is inserted and the switch is in the open position the heat source in the left hand cavity is isolated. Thus only the heat source in the right hand oven will heat up.

[0034] The front of the oven carries control knobs for selecting the temperature in the main oven, or in the right hand oven. An additional knob may be provided for the left hand oven which, when operated, overrides the switch to permit the left hand heat source to heat the left hand oven.

[0035] Also shown in Figures 1 and 3 is a pair of shelves 150, 151, one being located within each of the small ovens 130, 140 defined by the divider and the main cavity walls. In practice, each of the small ovens may be provided with more than one shelf, and two or three or more may be fitted to each of the small ovens. For clarity only one is shown in each oven.

[0036] The shelf 150 is fixed to the outer wall of the

main cavity (in the example the left hand wall when viewing the appliance from the front) and cantilevers out into the oven cavity so that it is normally not supported at its free end adjacent the divider. This ensures that the shelf 150 does not interfere with the divider, enabling the shelf to be left in place when the divider has been removed. For additional support, the shelf is also supported at its rear edge by a lug that protrudes from the rear wall of the Oven cavity.

[0037] The shelf 140 comprises a wire frame (best seen by the dotted lines of Figure 2) that is of generally rectangular outline, with a fixing bracket 155, 156 provided at the end that joins the outer wall of the cavity. This bracket comprises two spaced downwardly extending legs that engage in flanges provided on the outer wall of the cavity.

[0038] Figures 4 and 5 show two possible door assembly arrangements for the appliance. A two-part door is provided (shown closed in Figure 4 and part open in Figure 5) with one part 201 covering one small oven and the other part 202 covering the other. A handle 203, 204 is provided on each door to allow one part to be opened whilst the other is left closed, although they can both be opened at the same time. An optional locking device (not shown) is provided which comprises a releasable pin in one door that engages a recess in the other door. When the pin is engaged in the recess the two parts of the door can only be moved together. The two parts therefore function as one door. It is envisaged that the door may be used with the two parts locked together at times that the divider has been removed.

[0039] The divider 120 can be stored separate from the rest of the cooking appliance when not in use. Alternatively it could be stored within an optional drawer provided towards the bottom of the appliance as shown in the accompanying figures.

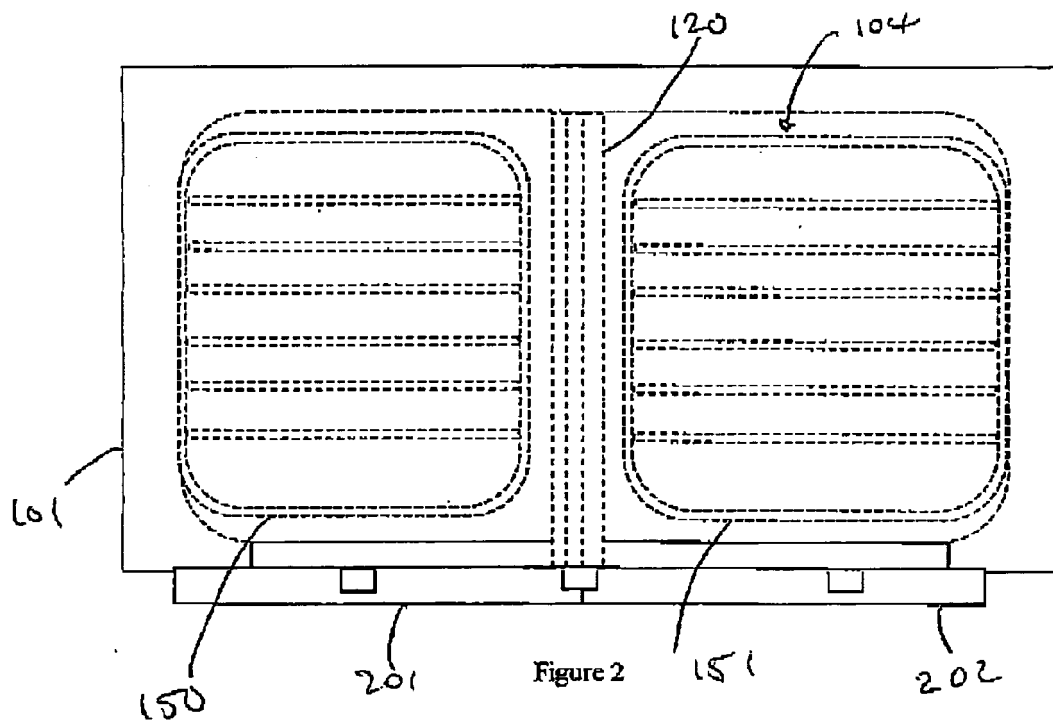
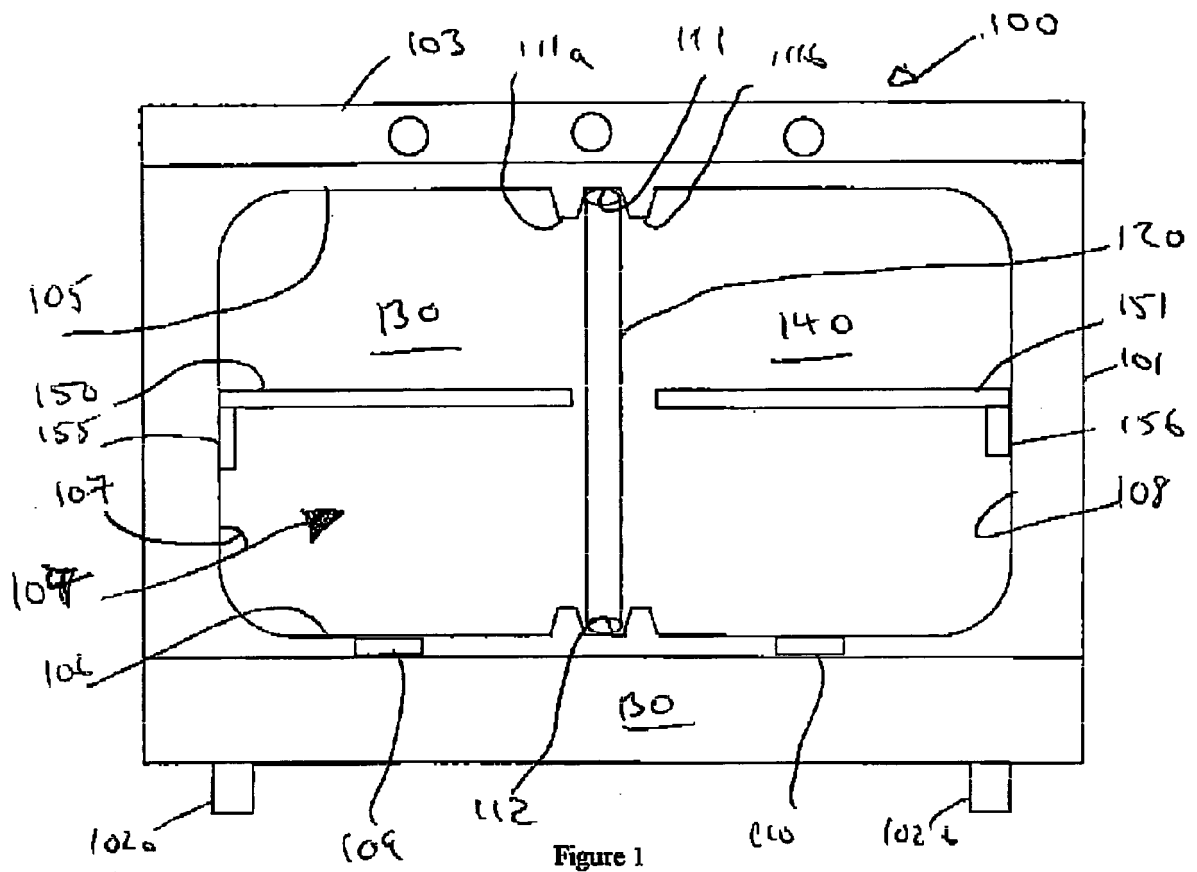
Claims

1. A cooking appliance comprising a housing which houses a main oven cavity, the main oven cavity including at least two heat sources, and a removable partition which can be located within the main oven cavity so that it is divided into two separate ovens, one of the heat sources being associated with a first one of the ovens and the other heat source with a second one of the ovens, and which can be removed from the main oven cavity to leave a single, larger oven, and control means for controlling the heat sources such that with the removable partition removed both heat sources are operated simultaneously to heat the single larger oven and with the removable partition in place the control means controls the heat sources such that only one of the two separate ovens is heated.
2. A cooking appliance according to claim 1 in which

the control means is responsive to the position of the partition.

divider is removed.

3. A cooking appliance according to claim 2 in which the control means includes a switch means which is operated when the divider partition is in position to divide the main oven in two, the control means controlling operation of the heat sources as a function of the position of the switch means. 5
4. A cooking appliance according to claim 3 in which the switch means comprises a micro switch which the partition acts upon when it is located in position to divide the main oven. 10
5. A cooking appliance according to claim 4 which further includes separate user operable controls for each of the divided ovens, with one of them being a master switch and the other a slave switch, the master switch overriding the slave switch. 15
6. The cooking appliance of any one of claims 1 to 5 in which the divider is locatable in the middle of the main cavity to split it into two identical sized ovens when it is located. 20
7. The cooking appliance of any preceding claim, in which the divider comprises two layers of material separated by an insulating layer. 25
8. The cooking appliance of any preceding claim, in which the divider locates in grooves located at the top and bottom of the main cavity. 30
9. The cooking appliance of claim 8, in which the grooves include a thermally insulating seal. 35
10. The cooking appliance of any of claims 1 to 9, further comprising a thermally insulating seal on the top and bottom edges of the divider. 40
11. The cooking appliance of any of the preceding claims, further comprising an arrangement of baffles forming a thermally insulating labyrinth type seal. 45
12. The cooking appliance of any preceding claim provided with a single door that covers the whole of the open front of the main cavity. 50
13. The cooking appliance of any of claims 1 to 11, provided with two doors that open separately 55
14. The cooking appliance of claim 13 in which the two doors can be joined as one. 55
15. The cooking appliance of claim 14, provided with an interlock mechanism that enables the two doors to be joined together to function as one door when the



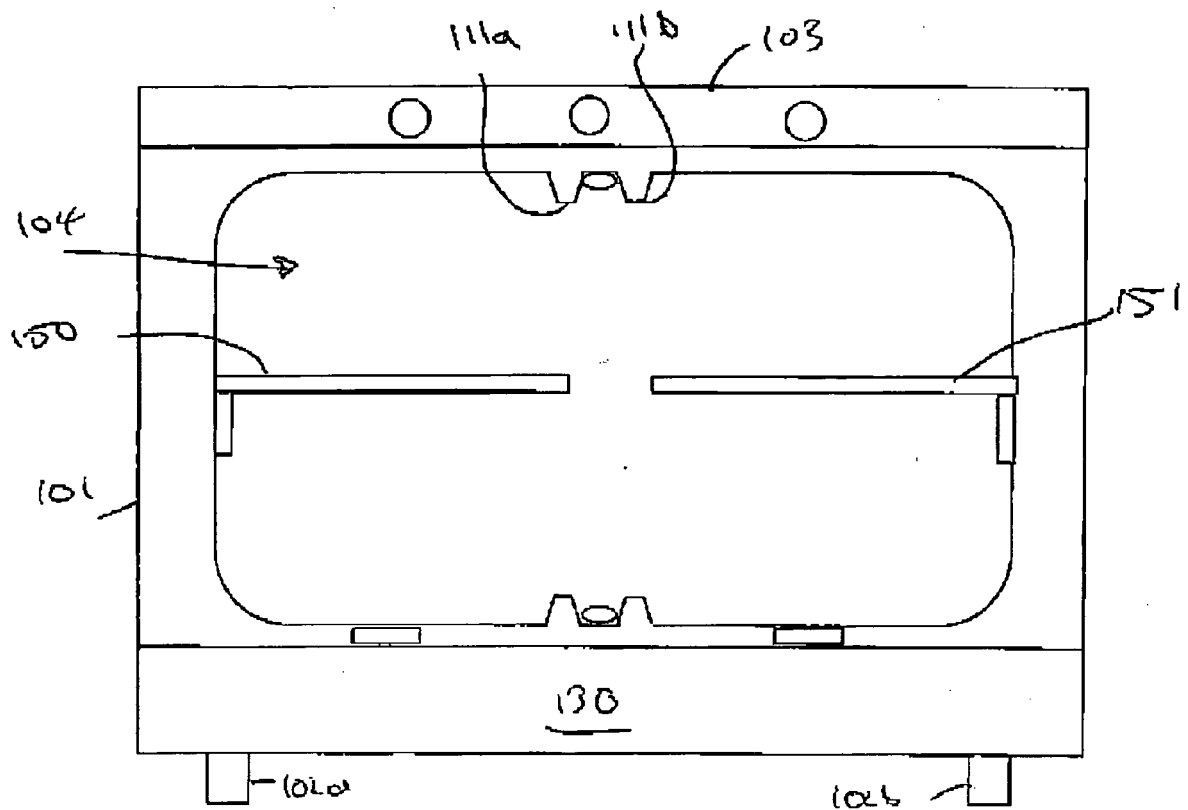


Figure 3

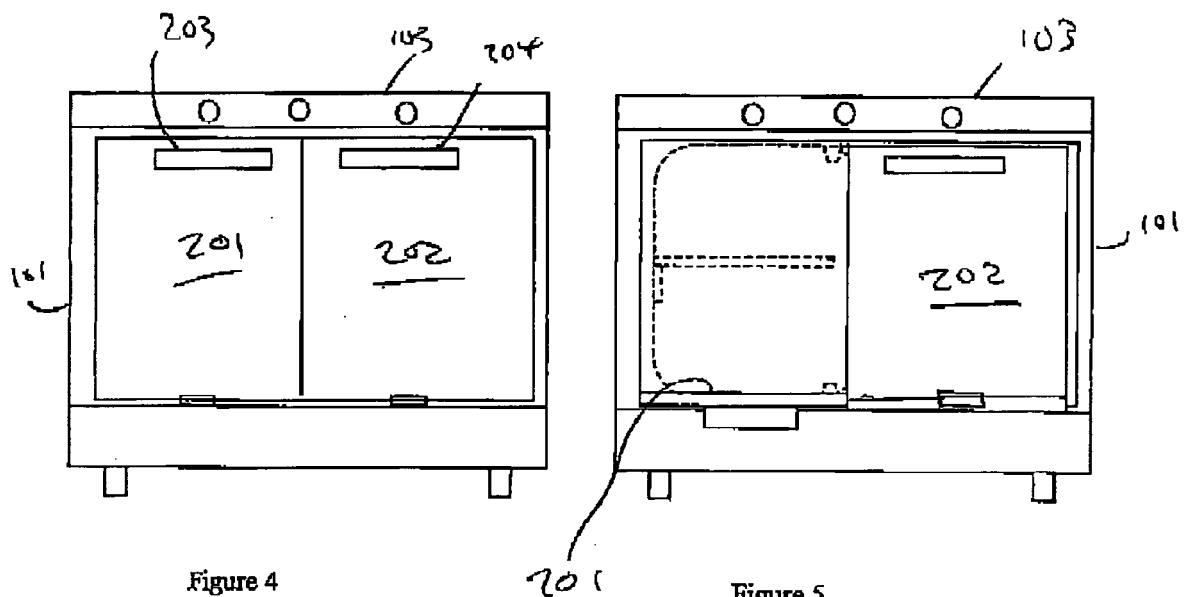


Figure 4

Figure 5



EUROPEAN SEARCH REPORT

Application Number
EP 08 25 2475

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 657 493 A (SAMSUNG ELECTRONICS CO LTD [KR]) 17 May 2006 (2006-05-17)	1-4,6,12	INV. F24C15/16
Y	* paragraphs [0023], [0053], [0054]; figures *	7-11, 13-15	
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F24C
Place of search		Date of completion of the search	Examiner
The Hague		27 October 2008	Verdoodt, Luk
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			

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EPO FORM 1503 03.82 (P04C01)

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

EP 08 25 2475

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
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