(12) UK Patent Application (19) GB (11) 2 346 438 (13) A

(43) Date of A Publication 09.08.2000

(21) Application No 9902297.2

(22) Date of Filing 03.02.1999

(51) INT CL[7]
F24C 15/08 15/04

(52) UK CL (Edition R)
F4W W6A3 W8

(56) Documents Cited
GB 2164143 A GB 0511445 A US 4245615 A

(58) Field of Search
UK CL (Edition Q) F4W
INT CL[6] F24C 15/08
ONLINE DATABASES: WPI EPODOC PAJ

(71) Applicant(s)
Stoves Group Plc
(Incorporated in the United Kingdom)
Stoney Lane, PRESCOT, Merseyside, L35 2XW,
United Kingdom

(72) Inventor(s)
Philip Albon

(74) Agent and/or Address for Service
Atkinson Burrington
The Technology Park, 60 Shirland Lane, SHEFFIELD,
S9 3PA, United Kingdom

(54) Abstract Title
Fabrication of cooking appliances

(57) A cooking appliance is fabricated by assembling a bottom panel to two side panels (202, 203). A front panel is secured to the bottom and side panels. Mounting cups (402) are attached to the oven cavity (401). Oven cavity (401) is then fixed to side panels (202, 203) by means of the mounting cups (402) slotting into support flanges (104). This method eliminates the need for the oven to be mounted into a chassis structure, as exists in conventionally fabricated cooking appliances.

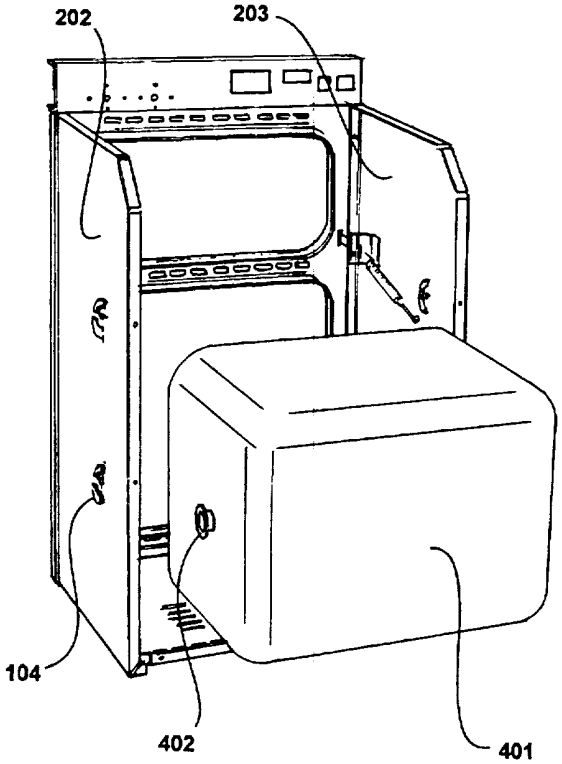

Figure 4

GB 2 346 438 A

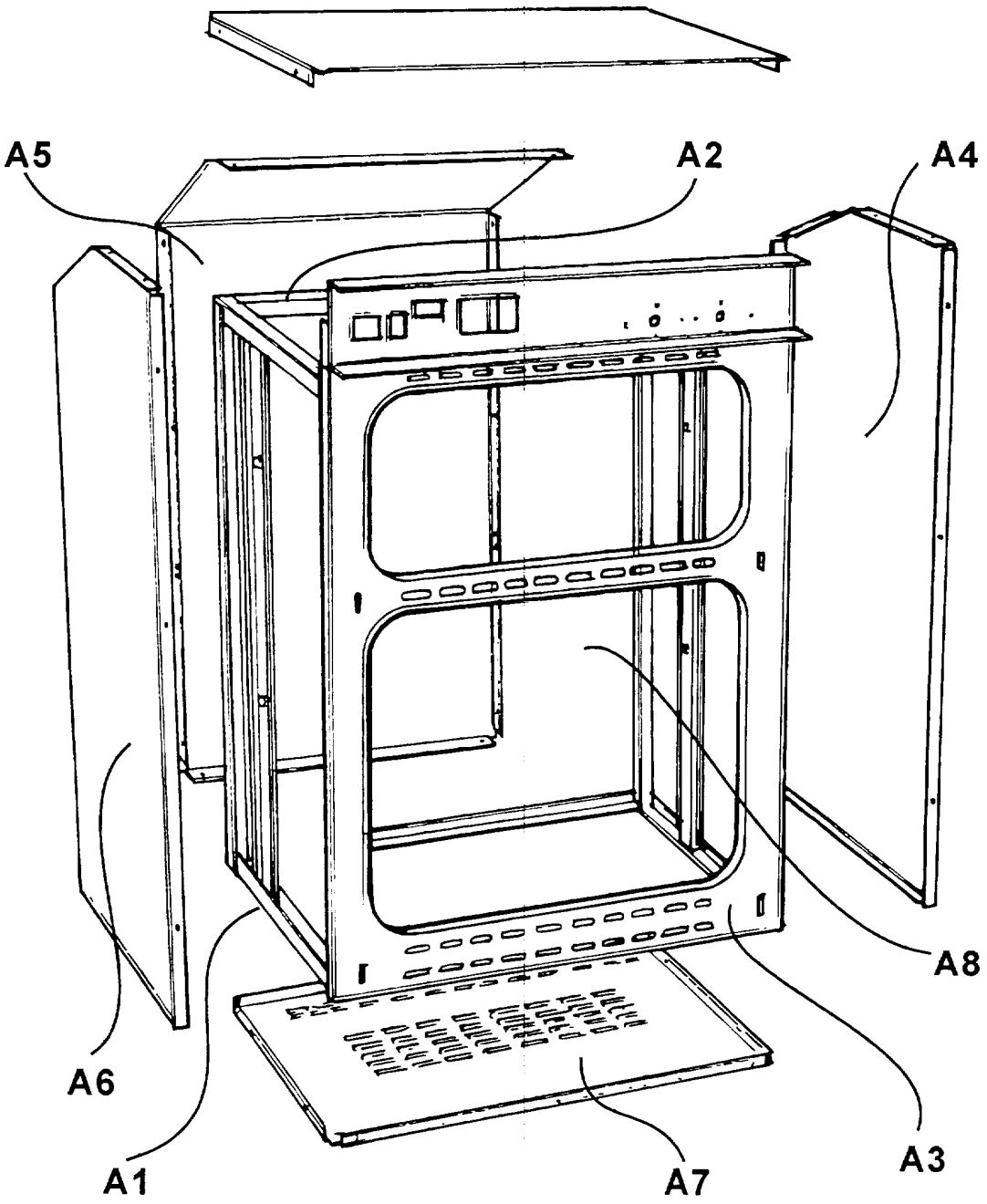

Figure A

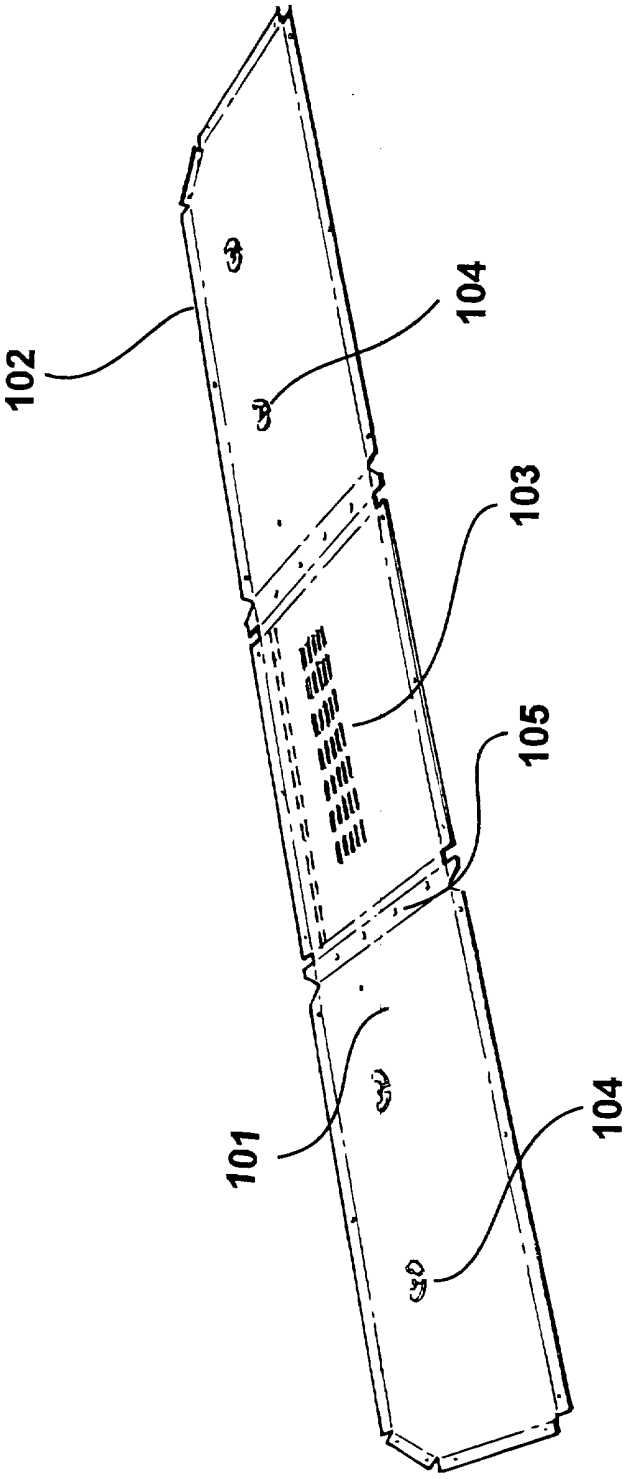

Figure 1

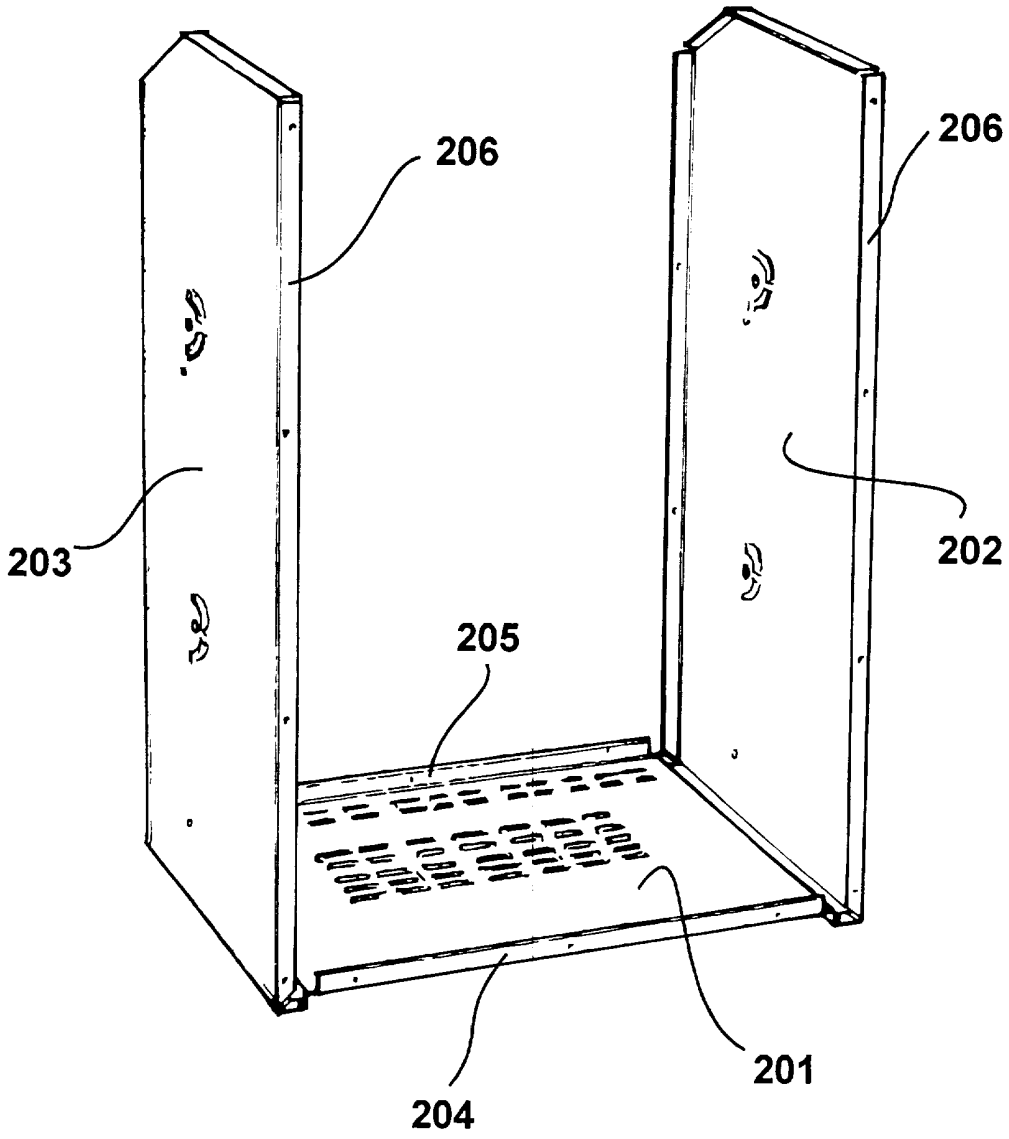

Figure 2

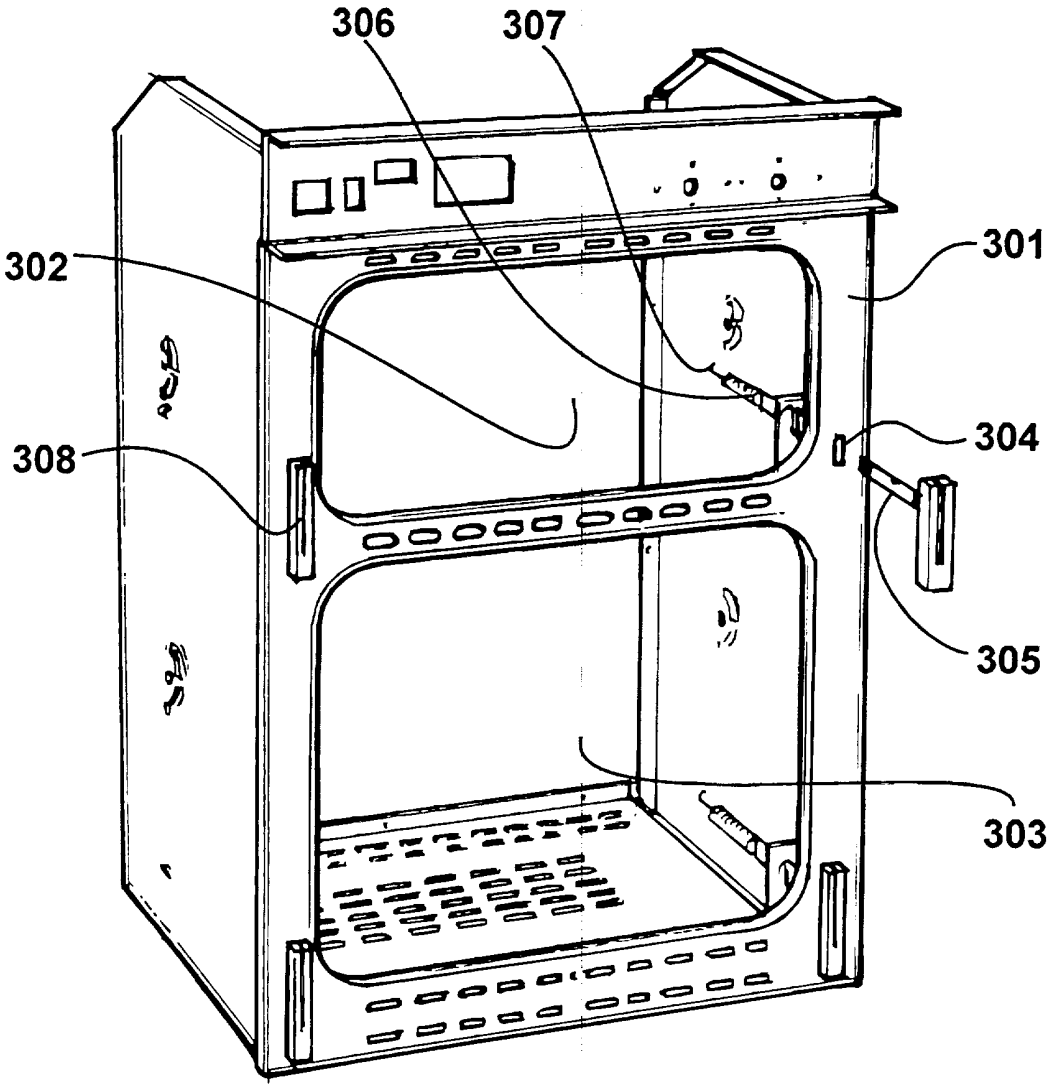

Figure 3

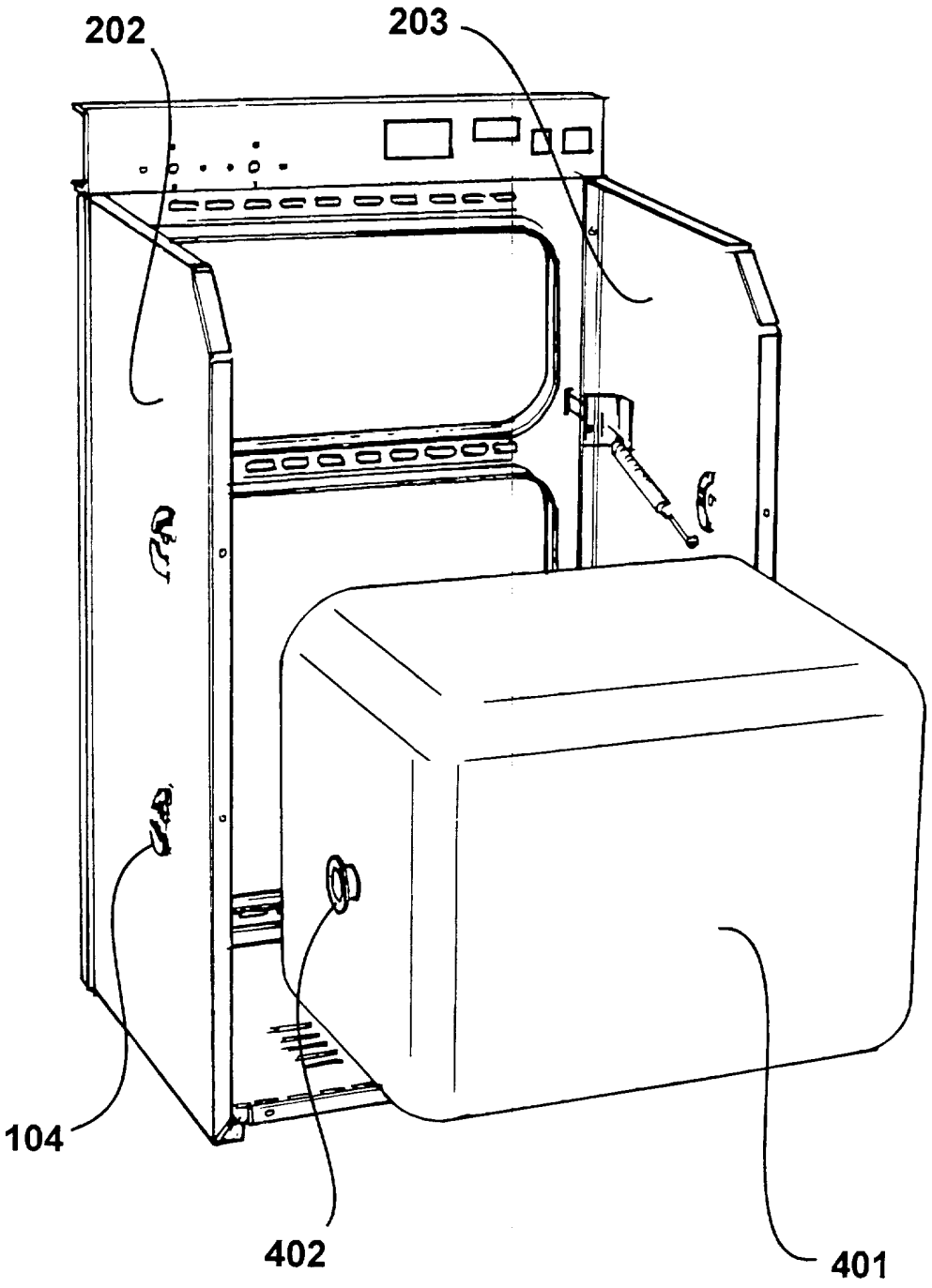

Figure 4

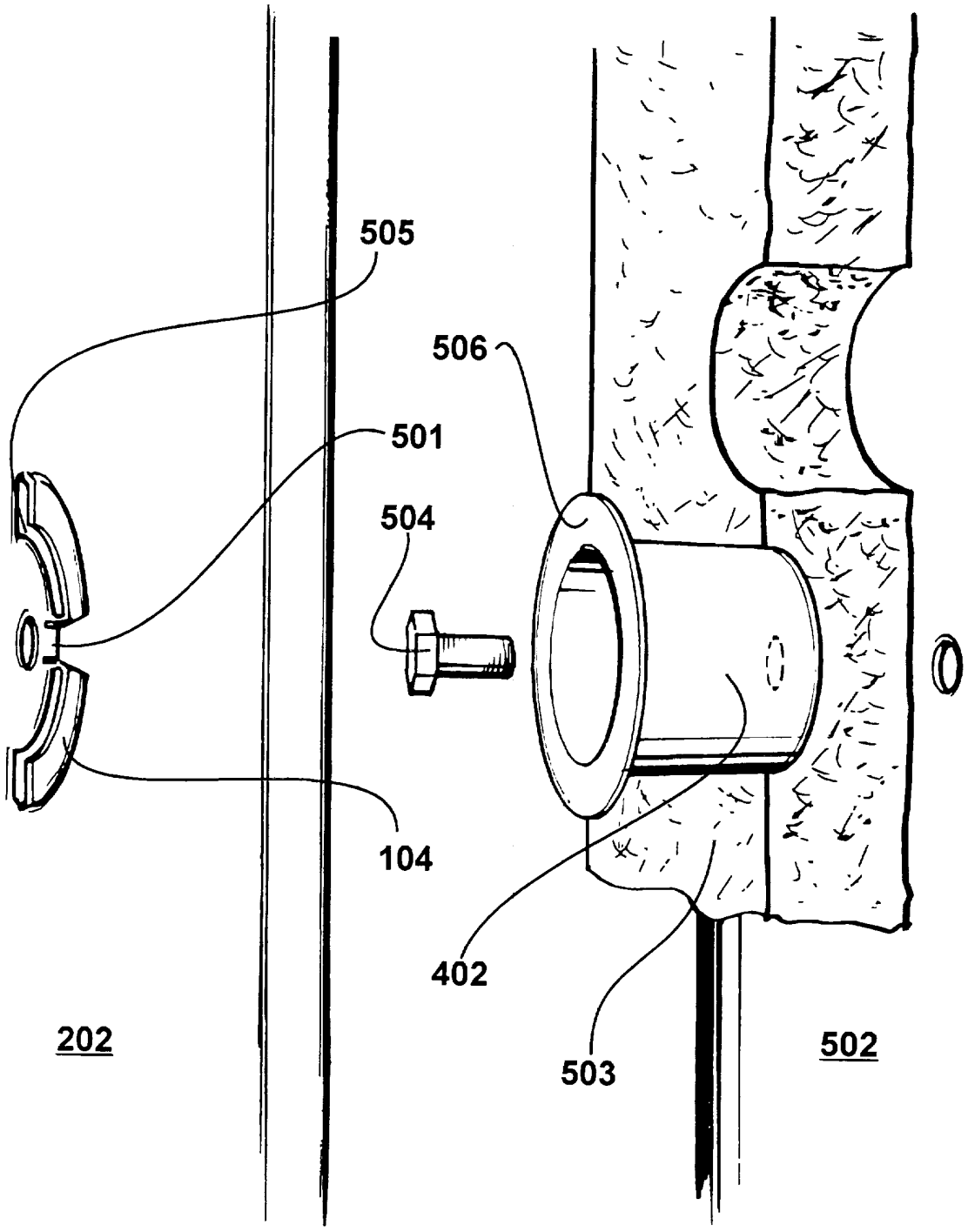

Figure 5

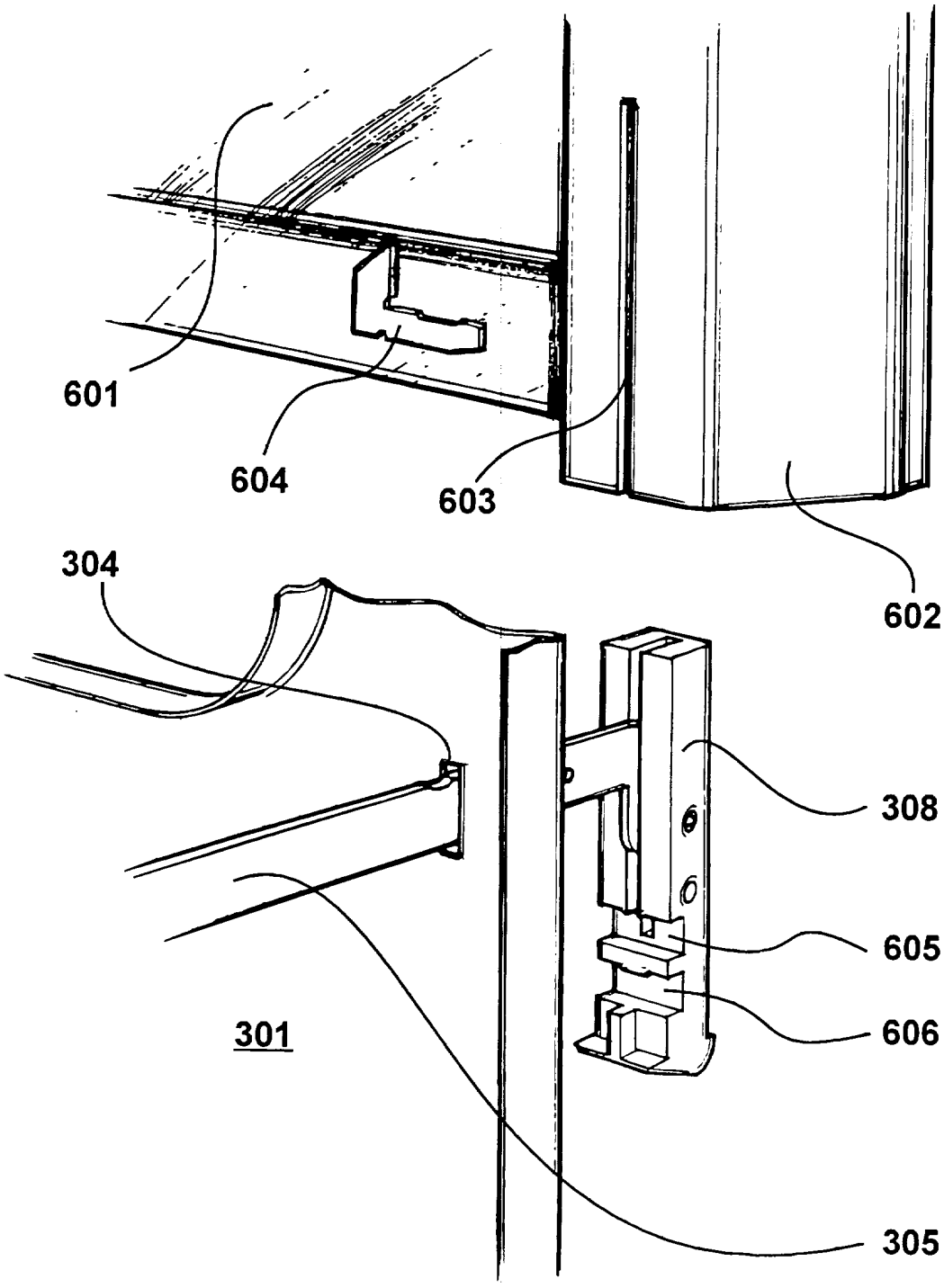

Figure 6

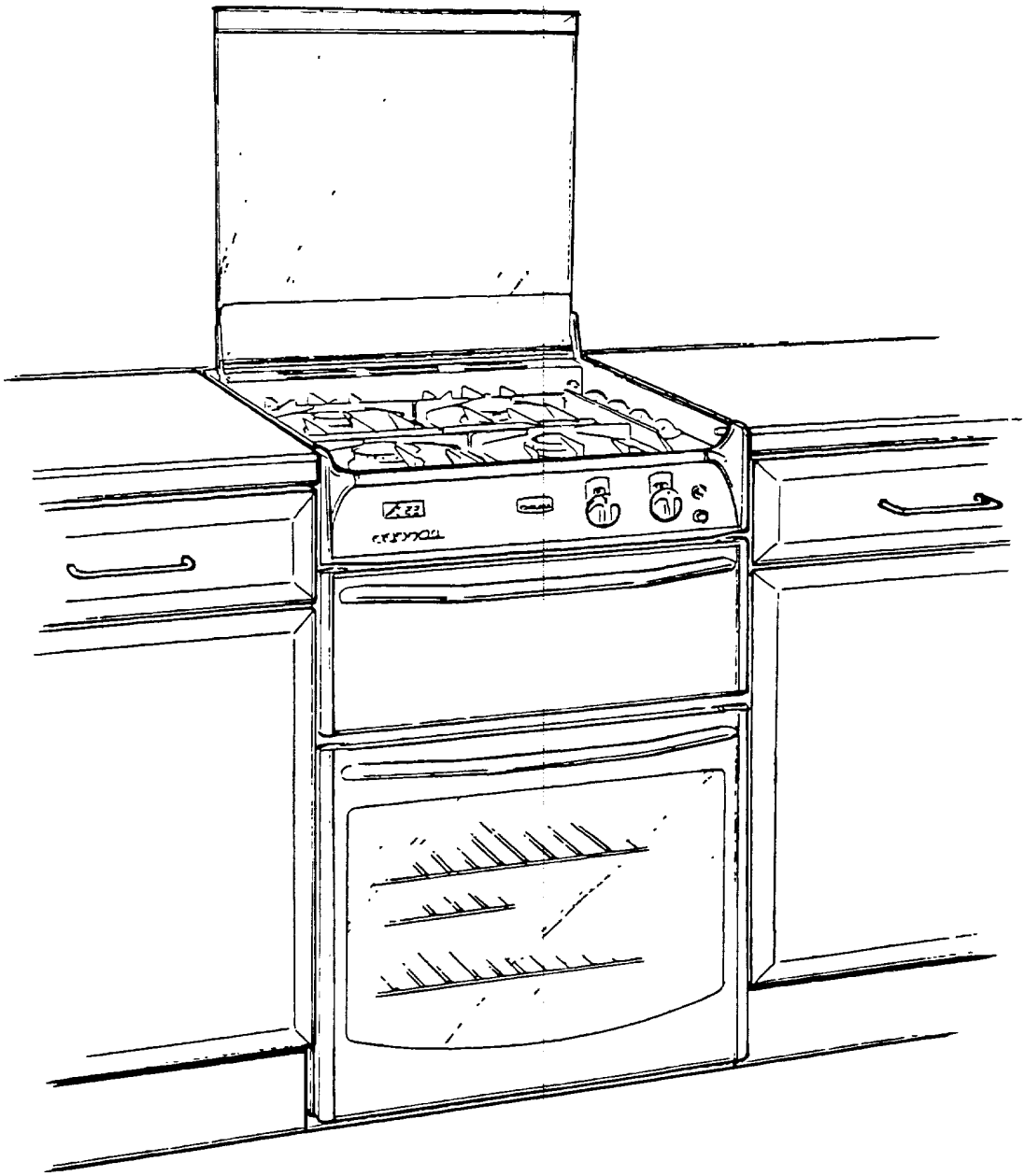

Figure 7

Fabrication of Cooking Appliances

The present invention relates to a method of fabricating a cooking appliance and a cooking appliance fabricated in accordance with the new method.

A conventional approach to the fabrication of a cooking appliance is illustrated in *Figure A*. A framework is constructed from components such as elements *A1*, *A2* and a front panel *A3* is attached to said elements using conventional metal joining techniques. The framework of elements *A1*, *A2* etc provides the main structural rigidity for the fabrication which is then enhanced by the addition of panels. Thus, side panels *A4* are attached to the sides of the construction, a rear panel *A5* is attached to the back of the construction, a top panel *A6* is attached to the top and a bottom panel *A7* is attached to the bottom of the construction. As previously stated, these panels enhance the rigidity of the structure but their primary function is to improve the aesthetic appearance of the appliance and to provide a degree of protection for internal components.

The front panel *A3* presents a plurality of openings into which oven cavities may be inserted. In the example shown in *Figure A*, the front panel *A3* includes an upper opening *A7* and a lower opening *A8*, each configured to receive a respective oven cavity thereby providing an enclosure for the cooking of foodstuffs. Conventionally, the oven cavities are inserted within openings *A7*, *A8* after all of the panels, such as panels *A4*, *A5* etc have been attached to the main frame construction. It is therefore necessary to provide a gap of sufficient size between the oven cavity housings and the surrounding panels so that insulating materials, such as fibreglass or expanded foam, may be located at a position to surround the oven cavities and thereby minimise heat loss from these cavities when the oven or ovens are in use.

A problem with the type of construction illustrated in *Figure A* is that a relatively large number of components are required in order to achieve the

required result. Attempts have been made to reduce the total component count, and thereby reduce assembly times but this often results in introducing new difficulties in terms of introducing the required level of insulation and in terms of jeopardising the structural rigidity.

According to a first aspect of the present invention, there is provided a method of fabricating a cooking appliance, comprising the steps of defining a bottom panel and two side panels; fitting a front panel to said side panel; inserting an oven cavity between said side panels; and securing said oven cavity to said side panels.

Preferably, the bottom panel and the two side panels are defined by cutting a metal sheet to define a metal blank of required size and folding said blank to define said panels. The oven cavity may also be inserted between said side panels from behind, thereby facilitating the introduction of additional insulation.

Preferably, the oven cavity is secured to the front panel and insulating means are fixed about said oven cavity prior to insertion from behind between said panels.

According to a second aspect of the present invention, there is provided a cooking appliance fabricated by defining a bottom panel and two side panels, wherein a front panel is fitted to said side panels and an oven cavity is inserted between said side panels, including securing means for securing said oven cavity to said side panels.

The invention will now be described by way of example only with reference to the following drawings.

Figure A illustrates a cooking oven fabricated in accordance with known techniques;

Figure 1 shows a metal blank cut from a sheet of galvanised steel;

Figure 2 shows an assembly process for folding the metal blank identified in *Figure 1*;

Figure 3 shows the application of a front panel to the folded blank identified in *Figure 2*;

Figure 4 details the insertion of an oven cavity between the side panels identified in *Figure 2*;

Figure 5 details an oven cavity mounting assembly of the type identified in *Figure 4*;

Figure 6 details an assembly for mounting a front door to the front panel identified in *Figure 3*; and

Figure 7 illustrated a complete cooking appliance assembly, assembled in accordance with the procedures detailed in *Figures 1* to *6*.

A metal blank **101** is shown in *Figure 1*, cut from a sheet of galvanised steel or aluminium coated steel typically 0.5 mm or 0.6 mm thick. The blank has been cut by means of a computer controlled carbon dioxide laser, which in turn may be programmed to cut blanks of differing shapes and sizes. In addition to cutting an outline **102** of the blank, the laser is also responsible for cutting a plurality of slots and holes **103**, so as to provide a degree of ventilation and to facilitate subsequent assembly.

After slots and holes **103** have been cut, a pressing operation is performed upon the blank in order to define support flanges **104** along with dimples **105** to provide an array of feet for resting the assembly upon an appropriate floor when in use.

During an assembly process, blank **101** is folded, as shown in *Figure 2*, to define a bottom panel **201**, a first side panel **202** and a second side panel **203**, blank **101** is also folded to allow floor panel **201** to be raised slightly above the floor level when supported by feet **105**, such that cooling air may flow through ventilation holes **103**.

A front edge **204** and a rear edge **205** of bottom panel **201** are folded upwards to facilitate subsequent assembly. In addition, similar edges **206** of the side panels are folded inwards, again facilitating subsequent assembly and enhancing the overall rigidity of the structure.

After the bottom panel and side panels have been defined, as shown in *Figure 2*, a front panel **301** is secured in place (by means of an array of rivets) as illustrated in *Figure 3*. Front plate **301** includes an upper opening **302** and a lower opening **303**, allowing upper and lower oven cavities to be secured respectively. Each opening **302** and **303** requires a pair of co-operating hinge mechanisms which, in this example, facilitate the opening of doors about horizontal axes of rotation. For the fabrication of each hinging mechanism, front plate **301** includes a hinge slot **304** configured to receive a hinge arm **305**. Each hinge arm **305** is retained in place by means of a spring **306**, secured to a respective hole **307** in a side panel. At the end of each hinge arm, there is provided a hinge pivot block **308**, configured to hinge about its respective hinge arm and to receive an appropriately fabricated door assembly, as will be subsequently described with reference to *Figure 6*.

A rear view of the assembly shown in *Figure 3* is detailed in *Figure 4*, in which an oven cavity **401** is located between side panels **203** and **204**. This is facilitated by the present flexible nature of said side panels. The mounting cups **402** are located in and slid into the support flanges **104**, until they are locked in place by the locking tooth **501**, detailed in *Figure 5*.

The cooking appliance is fabricated by defining a bottom panel and two side panels, fitting a front panel to said side panels, inserting an oven cavity between said side panels and securing said oven cavity to said side panels. The fabrication does not include the framework *A1*, *A2* etc. of the conventional method and so component count and assembly times are both reduced.

The oven assembly **401** consists of the steel oven body **502** which is clad in insulating material **503** with two mounting cups **402** attached.

Since the oven assembly is inserted between the side panels from behind the insulating material may be thicker than that used in the conventional method of fabrication, where thickness is limited by the size of the openings in the front plate.

The mounting cups **402** are attached to the oven body **502** by a bolt **504** as shown in *Figure 5*. *Figure 5* also shows a support flange **104** on a side panel **202**. The support flange **104** consists of two elements each of which is approximately quadrant shaped and configured to provide a gap **505** to accept the mounting cup flange **506**.

Figure 6 shows the method of attaching a door **601** to the hinge pivot block **308**. The hinge pivot block **308** is shown fixed to the corresponding hinge arm **305** which passes through the front plate **301**. The edges of the door consist of an extruded element **602** which has a cavity configured to accept the hinge pivot block **308** and a slot configured to accept the hinge arm **305**. The door is therefore slid down over the hinge pivot blocks until they are completely concealed. The door is then secured in place with a locking key **604** which is inserted through a rectangular hole in the extruded element **602** and into one of the two locking apertures **605** and **606** in the hinge pivot block **308**. The particular locking aperture which is used, either **605** or **606**, depends on the chosen door configuration. The upper edge of the locking key provides a stop to secure the position of the glass panel within the door.

Back and top panels are then secured to the side panels. This provides further rigidity to the whole structure.

The remaining assembly techniques resemble the conventional methods.

Figure 7 shows a complete cooking appliance fitted into kitchen furniture.

Claims

1. A method of fabricating a cooking appliance, comprising the steps of

defining a bottom panel and two side panels;

fitting a front panel to said side panels;

inserting an oven cavity between said side panels; and

securing said oven cavity to said side panels.

2. A method according to claim **1**, wherein said bottom panel and said two side panels are defined by cutting a metal sheet to define a metal blank of required size and folding said blank to define said panels.

3. A method according to claim **1** or claim **2**, wherein said oven cavity is inserted between said side panels from behind.

4. A method according to any of claims **1** to **3**, wherein said oven cavity is also secured to said front panel.

5. A method according to any of claims **1** to **4**, wherein insulating means are fixed about said oven cavity prior to insertion from behind between said side panels.

6. A method according to claim **1** or claim **2**, wherein oven door hinge mechanisms are assembled onto front and side panels before inserting an oven cavity between said side panels

7. A cooking appliance fabricated by defining a bottom panel and two side panels, wherein a front panel is fitted to said side panels and an oven cavity is inserted between said side panels, including securing means

for securing said oven cavity to said side panels.

8. A cooking appliance according to claim **7**, wherein said bottom panel and said two side panels are defined by cutting a metal sheet to define a metal blank of required size and folding said blank to define said panels.

9. A cooking appliance according to claim **7** or claim **8**, wherein said oven cavity has been inserted between said panels from behind.

10. A cooking appliance according to any of claims **7** to **9**, wherein said oven cavity is also secured to said front panel.

11. A cooking appliance according to any of claims **7** to **4**, wherein insulating means have been fixed about said cavity prior to the insertion of said cavity from behind between said side panels.

12. A cooking appliance according to claim **7** or claim **8**, wherein said oven door hinge mechanisms are assembled into front and side panels before inserting an oven cavity between said side panels.

13. A method of fabricating a cooking appliance substantially as herein described with reference to *Figures 1* to *7*.

14. A cooking appliance substantially as herein described with reference to *Figures 1* to *7*.

The Patent Office

INVESTOR IN PEOPLE

Application No: GB 9902297.2
Claims searched: All

Examiner: M C Monk
Date of search: 4 March 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): F4W

Int Cl (Ed.6): F24C (15/08)

Other: ONLINE DATABASES: WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
A	GB 2164143 A	BELLING & COMPANY Example of an oven cavity mounted within a frame.	
A	GB 511445	ROGERS Brackets (30).	
A	US 4245615	MAGIC CHEF INC Example of an oven cavity secured to the front frame.	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.