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(54) Oven door with natural ventilation cooling

(57) A door for ovens and domestic gas cookers is made up of an outer glass (1) and an inner glass (2) fixed in parallel and spaced relationship onto a pair of side uprights (3) each consisting of a section, preferably made of aluminum, inside which a hinge (4) is positioned for the connection to the oven base, as well as a handle (5) mounted on the door near the top thereof, said inner glass (2) having such a size as to cover the whole front of the oven. The uprights (3) have a substantially U-shaped cross-section, whose external end terminates with a tongue (6) which extends laterally, and a groove (7) is formed, at the internal corner of the upright (3), wherein the inner glass (2) is inserted, preferably in a dismountable way, the outer glass (1) extending laterally beyond said tongues (6) so as to cover completely the uprights (3), to which it is glued.

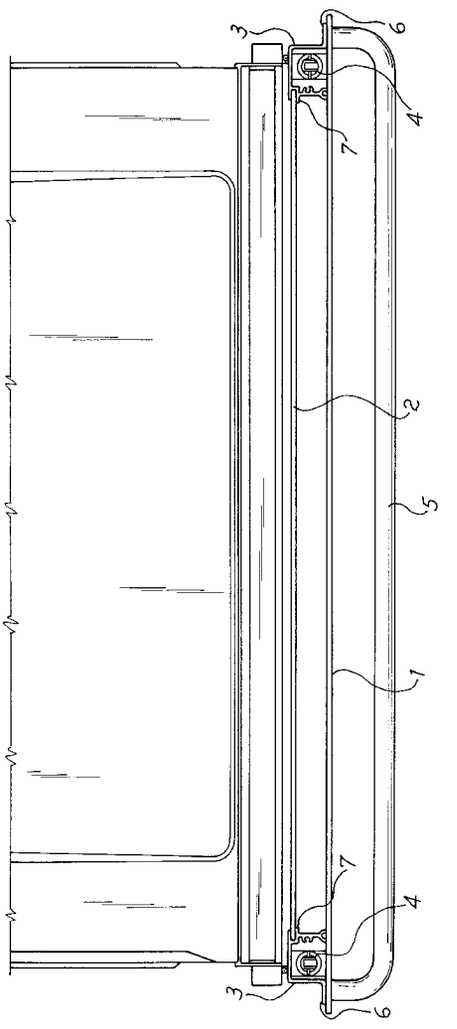

Fig.1

EP 0 723 116 A2

Description

The present invention relates to doors for ovens and domestic gas cookers, and particularly to a door with natural ventilation cooling.

It is known that one of the main characteristics that an oven door must have is heat insulation, i.e. the property of letting through its structure as little heat as possible. This is required mainly to prevent the user from getting burnt by accidentally touching the outer surface of the door while the oven is working. Furthermore, a lower loss of heat implies a greater efficiency of the oven and therefore lower energy consumption.

To this purpose, the typical structure of an oven door includes an outer door and an inner door, both made of punched sheet, with an insulating material inserted therebetween. These two sheets have a central opening, closed by a double glass, which acts as a window so as to able to check the cooking without opening the door. Since this is the portion which causes most of the loss of heat, due to the fact that it can not contain the insulating material arranged in the rest of the structure, various systems have been studied to lower the temperature of the outer glass.

An effective solution is disclosed in US pat. n. 4.014.312, wherein the structure of the door includes a vertical plate which divides it into an inner portion containing insulating material and an outer hollow portion wherein air can circulate. Since the two glasses of the window are placed one inside and one outside of the dividing plate, air can flow therebetween by natural circulation and remove by convection the heat coming from the oven. Such a solution, though effective, however implies a rather complicated structure which is therefore expensive to manufacture. Moreover, this kind of door has no adaptability to different oven sizes, since each door size requires different punches for the outer and inner sheets, with the significant cost increase deriving therefrom.

This limit is also found in other kinds of door having a window inserted within a sheet structure, even if the latter may simpler and cheaper. For example, the French patent n.2.600.757 discloses an oven door having a conventional structure, which also includes an additional outer glass as wide as the door and secured thereto by means of spacers which create a hollow space wherein the cooling air naturally circulates. It is clear that such a solution does not solve the above-illustrated problems of structural complexity, since a greater simplicity of the sheet portion comes along with the addition of a further glass member which implies a thicker and heavier door.

What said above is even more true for doors including more complicated and sophisticated cooling systems. These systems may range from a simple fan causing a forced two-way circulation within the door, as disclosed in the Italian patent n.1.237.294, to a door with an evacuated sealed hollow space containing a cooling liquid which undergoes a cycle of evaporation and subsequent condensation by means of a fan similar to the above-mentioned fan.

Therefore, the object of the present invention is to provide an oven door which overcomes the above-mentioned limits of complexity and lack of manufacturing adaptability of prior art doors.

This object is achieved by means of an oven door having the characteristics cited in claim 1.

A first fundamental advantage of the oven door according to the present invention is its structural simplicity, which allows its manufacturing at low costs both for the production of the members and the assembly thereof.

A second advantage of said oven door is the great ease of change of its size, since it is sufficient to cut the glasses and the sections of a different size with no need for new tools.

These and other advantages and characteristics of the oven door according to the present invention will be apparent to those skilled in the art from the following detailed description of two embodiments thereof referring to the annexed drawings wherein:

Fig. 1 is a top plan view of a first embodiment of the door according to the invention; and
Fig.2 is a side see-through view of a second embodiment of the present door.

With reference to said figures, there is seen that the oven door according to the present invention is made up of an outer glass 1 and an inner glass 2 fixed in parallel and spaced relationship onto a pair of side uprights 3 consisting of a section, preferably made of aluminum. Hinges 4 are positioned inside uprights 3, at the lower end thereof, for the connection to the oven base and the conventional opening of the door through a downward rotation around a horizontal axis. Said opening is carried out by gripping a handle 5 mounted on the door near the top thereof.

As it can be seen in the top view of fig. 1, uprights 3 have a substantially U-shaped cross-section, facing outwards, whose external end terminates with a tongue 6 which extends laterally. A groove 7 is formed, at the internal corner of upright 3, wherein the inner glass 2 is inserted. Said glass 2 covers the whole front of the oven, yet it is smaller than the outer glass 1 which extends laterally beyond tongue 6 so as to cover completely uprights 3, to which it is fixed preferably by gluing.

It should be noted that since the inner glass 2 covers the opening of the oven front, it assures a heat insulation higher than that of a sheet door which conducts heat better. Said insulation may be further improved by applying a heat-reflecting coating to the inner surface of glass 2. Furthermore, said glass 2 can be fixed into grooves 7 so as to be dismountable. thus allowing an easy cleaning also of the surfaces of glasses 1 and 2 facing the hollow space.

It is clear that the cross-section of uprights 3 may be somewhat changed in case of specific manufacturing needs. For example, a second groove may be formed between groove 7 and the point where glass 1 abuts, so as to insert a third intermediate glass which further increases the heat insulation capability of the door.

As far as the opening handle 5 is concerned, in the first embodiment shown in fig. 1 it has an elongated U-shape extending along the full width of the door to the tongues 6 of uprights 3. Handle 5 is preferably fixed to said tongues 6 by means of fasteners, such as screws or the like, which engage the end of handle 5 by going through the outer glass 1. In this case the width of handle 5 is fixed, but the vertical fixing position can be freely selected.

In the second embodiment shown in fig.2, handle 5 is not directly fixed to uprights 3 but to a crosspiece 8 which is inserted at the top of uprights 3 in abutment with the top edge of the outer glass 1. This solution avoids the need to make holes in tongues 6 and glass 1, also leaving freedom of width to handle 5, while the vertical position thereof is fixed and an additional member such as crosspiece 8 is required.

However, crosspiece 8 also acts as a "lid" for the hollow space between the two glasses, by closing uprights 3 at the top while leaving only passage holes for the circulation of air. In order to prevent hot air from flowing directly onto handle 5, said holes are suitably formed only on the inner and upper side of crosspiece 8, as indicated by the arrows in fig.2.

A further embodiment, not illustrated in the drawings, includes the gluing of handle 5 to the outer glass 1, with full freedom of position and size of the handle. However, in this case it is required that the joining surface has an adequate area so as to achieve a sufficiently strong fixing, whereby the gluing will preferably extend to the whole width of the handle.

As already mentioned, it is apparent that the above-described and illustrated embodiments of the oven door according to the invention are only examples susceptible of various changes. In particular, the cross-section of uprights 3 and the methods for mutually coupling and fixing the members which make up the door may be freely adapted according to the needs.

Claims

1. A door for ovens and domestic gas cookers, characterized in that it is made up of an outer glass (1) and an inner glass (2) fixed in parallel and spaced relationship onto a pair of side uprights (3) each consisting of a section, preferably made of aluminum, inside which a hinge (4) is positioned for the connection to the oven base, as well as a handle (5) mounted on the door near the top thereof, said inner glass (2) having such a size as to cover the whole front of the oven.

2. A door for ovens and domestic gas cookers according to claim 1, characterized in that the uprights (3) have a substantially U-shaped cross-section, facing outwards, whose external end terminates with a tongue (6) which extends laterally, and a groove (7) is formed, at the internal corner of the upright (3), wherein the inner glass (2) is inserted, preferably in a dismountable way, the outer glass (1) extending laterally beyond said tongues (6) so as to cover completely the uprights (3), to which it is fixed preferably by gluing.

3. A door for ovens and domestic gas cookers according to claim 1 or 2, characterized in that the handle (5) is fixed onto a crosspiece (8) inserted at the top of the uprights (3) and acting as a lid for the hollow space between the two glasses by closing the uprights (3) at the top while leaving only passage holes for the circulation of air, said holes being formed only on the inner and upper side of the crosspiece (8).

4. A door for ovens and domestic gas cookers according to claim 2, characterized in that the handle (5) is fixed onto the tongues (6) by means of fasteners which engage the ends of the handle (5) by going through the outer glass (1).

5. A door for ovens and domestic gas cookers according to claim 1 or 2, characterized in that the handle (5) is fixed onto the outer glass (1) by gluing.

6. A door for ovens and domestic gas cookers according to one of the preceding claims, characterized in that the inner surface of the inner glass (2) is provided with a heat-reflecting coating.

7. A door for ovens and domestic gas cookers according to one of the preceding claims, characterized in that it further includes a third glass placed between the outer glass (1) and the inner glass (2).

8. A door for ovens and domestic gas cookers according to claim 7, characterized in that the third glass is mounted in a second groove formed on the uprights (3).

Fig.1

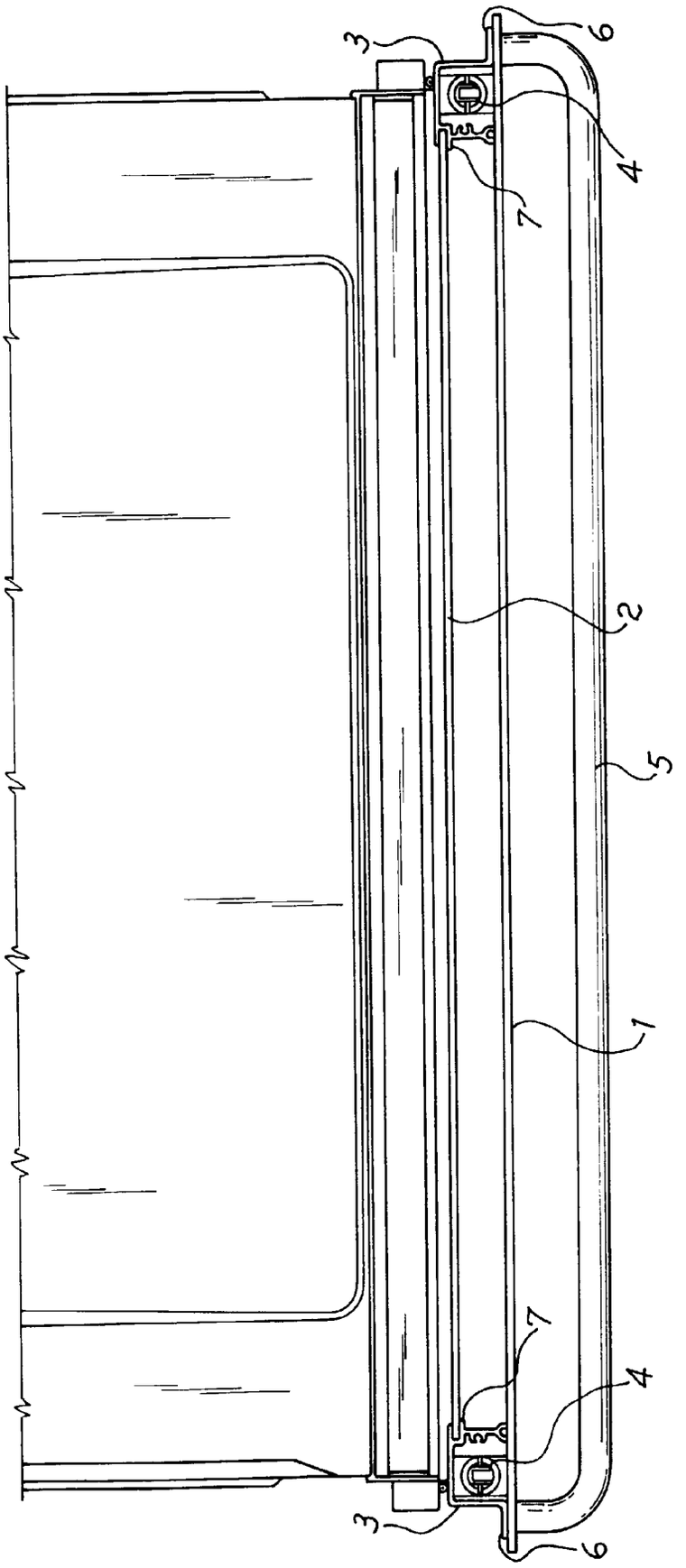

Fig.2