(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 473 787 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
08.10.2014 Bulletin 2014/41

(21) Application number: **10747224.3**

(22) Date of filing: **31.08.2010**

(51) Int Cl.:
F24C 15/20 *(2006.01)* ***F24C 15/32*** *(2006.01)*

(86) International application number:
PCT/EP2010/062658

(87) International publication number:
WO 2011/026819 (10.03.2011 Gazette 2011/10)

(54) AN OVEN WHEREOF HEAT LOSSES ARE DECREASED

OFEN MIT NIEDRIGEM WÄRMEVERLUST

FOUR DONT LES PERTES DE CHALEUR SONT DIMINUÉES

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

(30) Priority: **01.09.2009 TR 200906734**

(43) Date of publication of application:
11.07.2012 Bulletin 2012/28

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Description

[0001] The present invention relates to an oven wherein energy saving is provided by decreasing heat losses. An oven according to the preamble of claim 1 is known from EP 0 319 673 A1.

[0002] At least one heater and a fan are provided in ovens wherein the baking process is performed by means of convection. The oven casing, which is formed by the walls surrounding the oven cavity wherein the baking process is performed, is divided into two compartments by means of a fan covering the plate located in front of the rear wall. The fan and the heater are disposed into the compartment remaining between the casing rear wall and the fan covering plate. The air heated by the heater and moved by the fan is transferred into the oven cavity by means of the blowing holes situated on the fan covering plate. Furthermore, in ovens, discharge of the water vapor produced during the baking process is provided by means of an exhaust opening which is generally situated at the upper side of the casing. In order for the baking process to be efficient, the water vapor produced in the oven cavity is discharged to the outside surrounding by means of the exhaust opening, however in the meantime heat loss occurs since the hot air is also discharged outside, thereby increasing energy consumption.

[0003] In the state of the art European patent document no EP0598211, an oven is explained comprising an exhaust opening through which the vapors produced during cooking can flow outside, wherein the temperature and moisture can be controlled by changing the flow cross-section of the vapor opening by means of a throttle disposed thereon.

[0004] In the state of the art Japanese patent document no JP2007054221, a guarding plate is mounted under the exhaust path between the upper heating part and the entrance of the exhaust path that prevents the particles scattered from the cooking foodstuffs from reaching and sticking on the inner walls of the exhaust path.

[0005] The aim of the present invention is the realization of an oven wherein heat losses are decreased by preventing the discharge of hot air from the exhaust opening directly to the outside.

[0006] The oven realized in order to attain the aim of the present invention is explicated in the claims.

[0007] The oven comprises a barrier which is integrated to the upper wall of the casing surrounding the oven cavity, which is positioned on the edge of the exhaust opening, which extends downwards from the inner surface of the casing upper wall and which according to the invention forms an obstruction between the hot air blowing holes on the fan covering plate and the exhaust opening by at least partially surrounding the exhaust opening, thereby which prevents the hot air transferred from the hot air blowing holes into the oven cavity from being directly guided into the exhaust opening.

[0008] In the present invention, the barrier is further having an arcuate cross section and convexed toward the side of the blowing holes. Thus, the barrier due to its arcuate shape forms a wall in front of the hot air guided to the exhaust opening from various directions. Preferably, the barrier is manufactured of a metal plate.

[0009] In another embodiment of the present invention, the barrier is secured around the exhaust opening on the lower surface of the casing upper wall by using one of the mechanical fastening methods like welding, riveting, bolting or snap-fitting.

[0010] In another embodiment of the present invention, the barrier is manufactured by the method of deep drawing at least some portion of the edge of the exhaust opening.

[0011] In an embodiment of the present invention, the barrier has an extension formed by turning its lower end toward its inner side wherein the exhaust opening is located and the surface of which facing the fan covering plate is shaped convexly. The extension provides the barrier to impede the hot air that tries to reach the exhaust opening from various directions.

[0012] The barrier of the present invention decreases heat losses and provides energy savings by preventing the hot air from directly reaching the exhaust opening.

[0013] The oven realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the schematic view of an oven.
Figure 2 - is the schematic view of the exhaust opening on the upper wall of the oven and the barrier between the exhaust opening and the blowing holes.
Figure 3 - is the schematic view of an oven in another embodiment of the present invention.

[0014] The elements illustrated in the figures are numbered as follows:

1. Oven
2. Casing
3. Oven cavity
4. Fan
5. Fan compartment
6. Fan covering plate
7. Blowing hole
8. Exhaust opening
9. Barrier
10. Extension

[0015] The oven (1) comprises a casing (2), an oven cavity (3) which is located inside this casing (2) and wherein the trays containing the foods to be baked are disposed, a heater (not illustrated in the figures) which provides the air in the oven cavity (3) to be heated, a fan (4) which is located on the side wherein the casing (2) rear wall is situated and which moves the heated air, a fan compartment (5) wherein the heater and the fan (4) are disposed, a fan covering plate (6) which separates

the oven cavity (3) and the fan compartment (5), more than one blowing hole (7) which is located on the fan covering plate (6) and which provides the air moved by the fan (4) to be transmitted to the oven cavity (3), and an exhaust opening (8) which is located on the casing (2) upper wall and which provides the water vapor produced during the baking process to be discharged to the outside surrounding.

[0016] The oven (1) of the present invention comprises a barrier (9) which is integrated to the upper wall of the casing (2) and extends towards the inside of the oven cavity (3) from the upper wall of the casing (2) preferably in a direction vertical to the casing (2) upper wall, and which forms an obstruction between the blowing holes (7) and the exhaust opening (8) by at least partially surrounding the exhaust opening (8) and prevents the hot air blown from the blowing holes (7) from being guided directly to the exhaust opening (8).

[0017] In the oven (1) of the present invention, during the baking process, the air heated by the heater in the fan compartment (5) and moved by the fan (4) is directed to the oven cavity (3) by passing through the blowing holes (7) on the fan covering plate (6). Some portion of the hot air passing from the blowing holes (7) is directly guided to the exhaust opening (8) and the hot air is provided to impact the barrier (9) that forms an obstruction around the exhaust opening (8) and thus, is prevented from being discharged from the exhaust opening (8) just after leaving the blowing hole (7).

[0018] In the present invention, the barrier (9) is shaped convexly and has an arcuate cross section (Figure 2). Preferably, the barrier (9) is produced from a metal plate, wherein what is shaped convexly is the surface facing the fan covering plate (6). The barrier (9) forms an obstruction in front of the hot air leaving the blowing holes (7) and trying to reach the exhaust opening (8) from various direction.

[0019] In another embodiment of the present invention, the barrier (9) is secured around the exhaust opening (8) on the lower surface of the casing (2) upper wall by one of the fastening methods like welding, riveting, bolting or snap-fitting.

[0020] In another embodiment of the present invention, the barrier (9) is produced by the method of deep drawing at least some portion of the edge of the exhaust opening (8) (Figure 3).

[0021] In another embodiment of the present invention, the exhaust opening (8) and the barrier (9) are produced by the drawn cut-out method by cutting out the exhaust opening (8) on the upper wall of the casing (2) and by drawing out the edge portion wherein the barrier (9) is situated.

[0022] In an embodiment of the present invention, the barrier (9) has an extension (10) formed by bending its lower end towards the exhaust opening (8). The extension (10) provides the barrier (9) to impede the hot air that tries to reach the exhaust opening (8) from various directions.

[0023] The barrier (9) of the present invention increases the effectiveness of hot air in the oven cavity (3) and reduces the heat losses, and thus provides savings in energy by preventing the hot air blown from the blowing holes (7) of the fan covering plate (6) from being guided directly to the exhaust opening (8).

[0024] It is to be understood that the present invention is not limited by the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. An oven (1) comprising a casing (2), an oven cavity (3) which is located inside this casing (2) and wherein the trays containing the foods to be baked are disposed, a fan (4) which is located on the side wherein the casing (2) rear wall is situated and which moves the heated air, a heater, a fan compartment (5) wherein the fan (4) and the heater are disposed, a fan covering plate (6) which separates the oven cavity (3) and the fan compartment (5), more than one blowing hole (7) which is located on the fan covering plate (6) and which provides the air moved by the fan (4) to be transmitted to the oven cavity (3), and an exhaust opening (8) which is located on the casing (2) upper wall and which provides the water vapor produced during the baking process to be discharged to the outside surrounding, and a barrier (9) which is integrated to the upper wall of the casing (2), which extends towards the inside of the oven cavity (3) from the upper wall of the casing (2), wherein the barrier (9) forms an obstruction between the blowing holes (7) and the exhaust opening (8), **characterized in that** the barrier (9) is at least partially surrounding the exhaust opening (8), and **in that** the surface of the barrier (9) which faces the fan covering plate (6) is shaped convexly, thus having an arcuate cross section.

2. An oven (1) as in Claim 1, **characterized in that** the barrier (9) has been secured around the exhaust opening (8) on the lower surface of the casing (2) upper wall by one of the methods welding, riveting, bolting or snap-fitting.

3. An oven (1) as in any one of the above Claims, **characterized in that** the barrier (9) has been produced by the method of deep drawing at least some portion of the edge of the exhaust opening (8).

4. An oven (1) as in any one of the Claims 1 to 2, **characterized in that** the exhaust opening (8) and the barrier (9) have been produced by the drawn cut-out process by cutting out the exhaust opening (8) and

by drawing out the edge portion wherein the barrier (9) is situated.

5. An oven (1) as in any one of the above Claims, **characterized in that** the barrier (9) having an extension (10) which has been formed by bending its lower end towards the exhaust opening (8).

Patentansprüche

1. Ofen (1), umfassend ein Gehäuse (2), einen Ofenraum (3), der im Gehäuse (2) angeordnet ist und in dem die Bleche angeordnet sind, die die zu backenden Speisen enthalten, ein Gebläse (4), das an der Seite angeordnet ist, in dem die Rückwand des Gehäuses (2) angeordnet ist und das die erwärmte Luft bewegt, eine Heizeinrichtung, eine Gebläseaufnahme (5), in der das Gebläse (4) und die Heizeinrichtung angeordnet sind, eine Gebläseabdeckplatte (6), die den Ofenraum (3) und die Gebläseaufnahme (5) trennt, mehrere Blaslöcher (7), die an der Gebläseabdeckplatte (6) angeordnet sind und dafür sorgen, dass die vom Gebläse (4) bewegte Luft an den Ofenraum (3) geleitet wird, und eine Abluftöffnung (8), die an der oberen Wand des Gehäuses (2) angeordnet ist und dafür sorgt, dass der Wasserdampf, der während des Backvorgangs erzeugt wird, nach außen abgegeben wird, und eine Barriere (9), die in die obere Wand des Gehäuses (2) integriert ist und sich von der oberen Wand des Gehäuses (2) ins Innere des Ofenraums (3) erstreckt, wobei die Barriere (9) ein Hindernis zwischen den Blaslöchern (7) und der Abluftöffnung (8) bildet, **dadurch gekennzeichnet, dass** die Barriere (9) die Abluftöffnung (8) wenigstens teilweise umgibt und dass die Fläche der Barriere (9), die der Gebläseabdeckplatte (6) zugewandt ist, konvex geformt ist und dadurch einen bogenförmigen Querschnitt aufiwest.

2. Ofen (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Barriere (9) um die Abluftöffnung (8) an der unteren Fläche der oberen Wand des Gehäuses (2) durch eins der Verfahren Schweißen, Vernieten, Verschrauben oder Einrasten gesichert wurde.

3. Ofen (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Barriere (9) durch das Verfahren des Tiefziehens von wenigstens einem Abschnitt der Kante der Abluftöffnung (8) hergestellt wurde.

4. Ofen (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Abluftöffnung (8) und die Barriere (9) durch den gezogenen Ausschneideprozess hergestellt wurden, indem die Abluftöffnung (8) ausgeschnitten wurde und der Kantenabschnitt, an dem die Barriere (9) angeordnet ist, herausgezogen wurde.

5. Ofen (1) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Barriere (9) eine Verlängerung (10) aufweist, die durch Biegen ihres unteren Endes zur Abluftöffnung (8) hin gebildet wurde.

Revendications

1. Un four (1) comprenant un revêtement (2), une chambre de cuisson (3) qui est située dans le revêtement (2) et dans laquelle les plaques contenant les aliments à cuire sont disposées, un ventilateur (4) qui est situé sur le côté où la paroi arrière du revêtement (2) est située et qui remue l'air chauffé, un dispositif de chauffage, un compartiment de ventilateur (5) dans lequel le ventilateur (4) et le dispositif de chauffage sont disposés, une plaque de couverture de ventilateur (6) qui sépare la chambre de cuisson (3) et le compartiment de ventilateur (5), plus d'un trou de soufflage (7) qui est situé sur la plaque de couverture de ventilateur (6) et qui permet la transmission de l'air remué par le ventilateur (4) à la chambre de cuisson (3), une ouverture d'échappement (8) qui est située sur la paroi supérieure du revêtement (2) et qui permet à la vapeur d'eau produite lors du processus de cuisson d'être évacuée à l'extérieur, et une barrière (9) qui est intégrée dans la paroi supérieure du revêtement (2), qui s'étend vers l'intérieur de la chambre de cuisson (3) à partir de la paroi supérieure du revêtement (2), où la barrière (9) forme une obstruction entre les trous des soufflage (7) et l'ouverture d'échappement (8), **caractérisé en ce que** la barrière (9) entoure au moins partiellement l'ouverture d'échappement (8) et **en ce que** la surface de la barrière (9) faisant face à la plaque de couverture de ventilateur (6) est de forme convexe, ainsi présentant une section transversale en forme d'arc.

2. Un four (1) selon la Revendication 1, **caractérisé en ce que** la barrière (9) est fixée autour de l'ouverture d'échappement (8) sur la surface inférieure de la paroi supérieure du revêtement (2) par une des méthodes tels que soudage, rivetage, boulonnage ou encliquetage.

3. Un four (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la barrière (9) est produite par l'emboutissage profond d'au moins une partie du bord de l'ouverture d'échappement (8).

4. Un four (1) selon l'une quelconque des revendications de 1 à 2, **caractérisé en ce que** l'ouverture

d'échappement (8) et la barrière (9) sont produites en découpant l'ouverture d'échappement (8) et en emboutissant la partie du bord où la barrière (9) est située.

5. Un four (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la barrière (9) présente une extension (10) qui est formée en pliant son extrémité inférieure vers l'ouverture d'échappement (8).

Figure 1

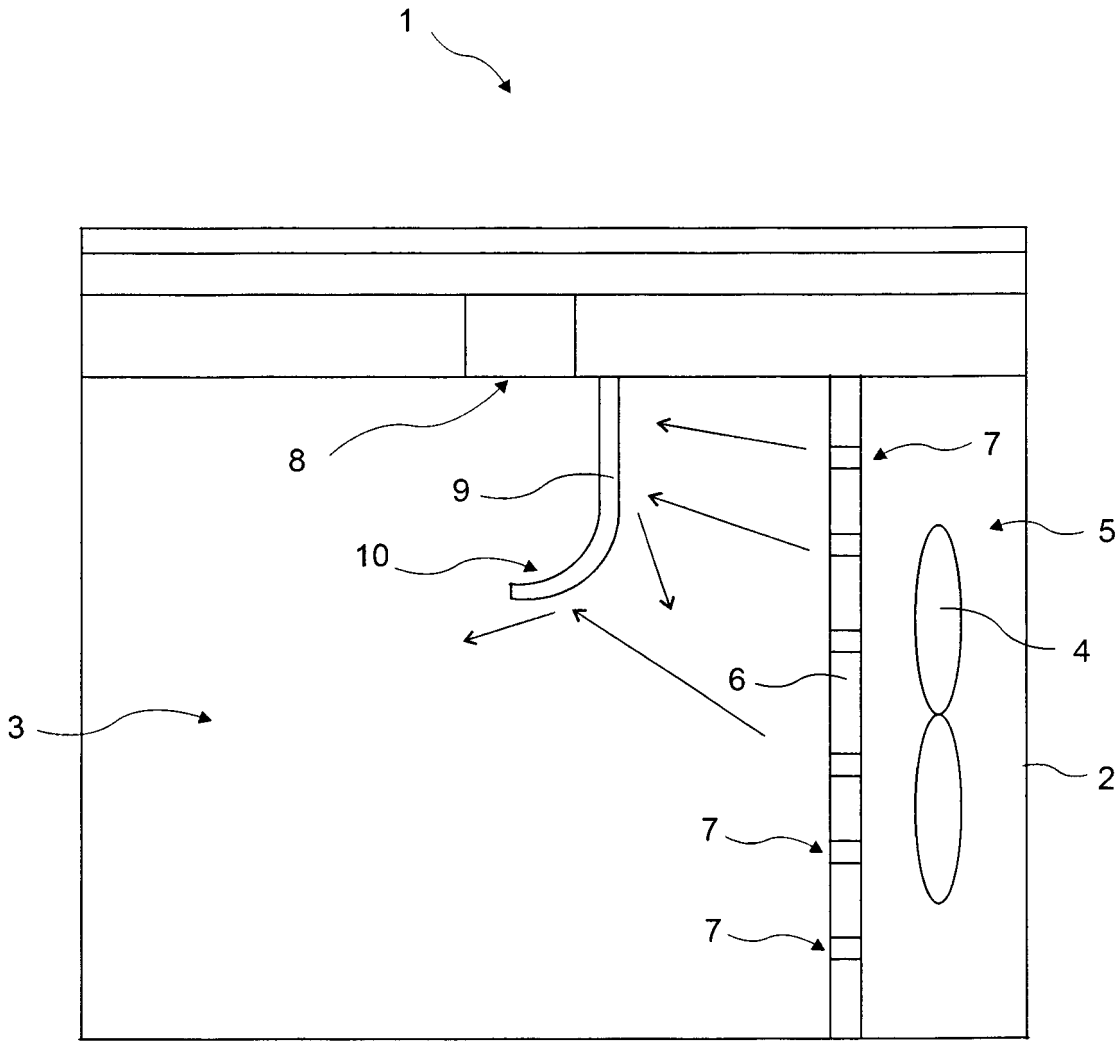


Figure 2

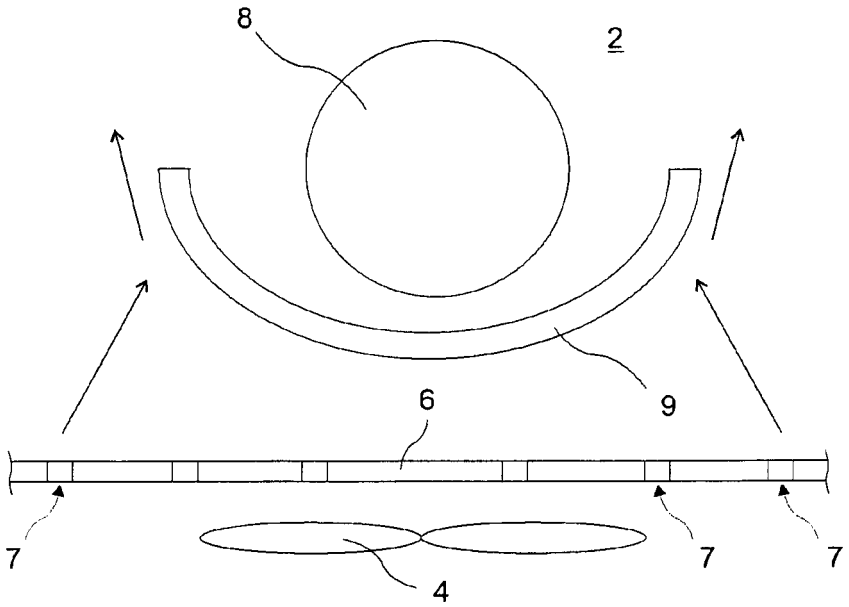
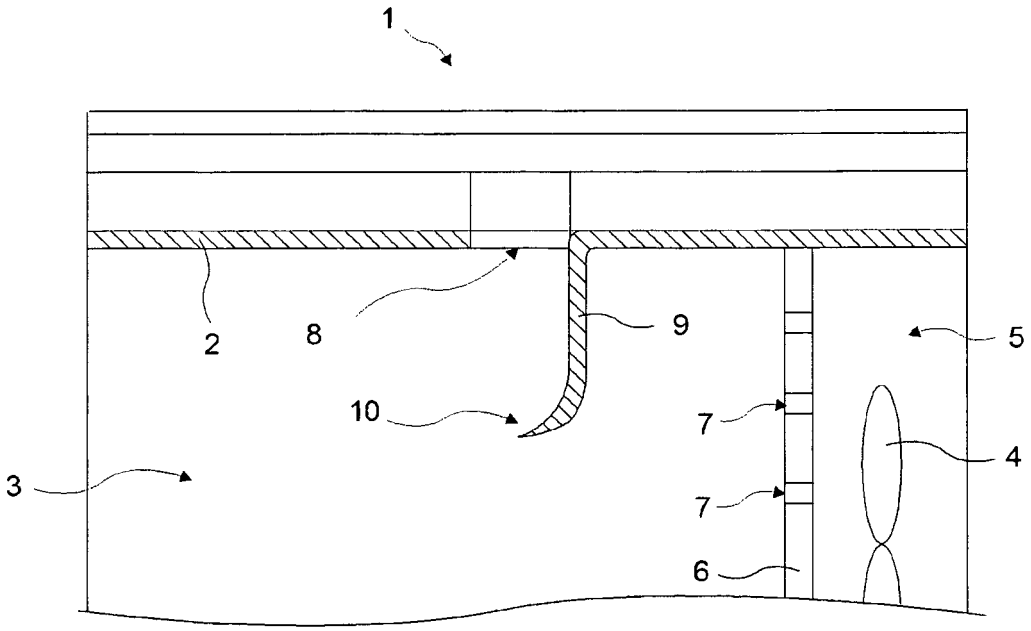


Figure 3



REFERENCES CITED IN THE DESCRIPTION

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- JP 2007054221 B **[0004]**