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A COOKING DEVICE COMPRISING A LIQUID GUIDANCE MEANS

KOCHVORRICHTUNG MIT EINEM FLÜSSIGKEITSFÜHRUNGSMITTEL

DISPOSITIF DE CUISSON COMPORTANT UN MOYEN DE GUIDAGE DE LIQUEDE

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Description

[0001] The present invention relates to a cooking device comprising a liquid guidance chamber.

[0002] In cooking devices, for example in ovens, generally glass is preferred as the door material since it can be easily cleaned. Moreover, while the oven is heated at the start of the cooking process, glass heats up later than the oven cavity and the oven body due to its chemical structure and vapor forms on the glass surface due to the temperature difference. After a while, the glass surface also reaches the same temperature as the oven cavity and the vapor thereon starts flowing towards the lower side of the door by condensing. In the meantime, when the oven door is opened, the droplets on the door spill onto the furniture from the opening under the door due to the angle the door acquires. For the solution of the said problem, in some ovens the door is produced from enamel material which heats up more quickly, but these type of doors are not preferred since they are hard to clean.

[0003] Another method used for the solution of the said problem is to use various means to accelerate the heating of the door.

[0004] In the state of the art European Patent Application No. EP1890085, an oven is described comprising an electrical heater disposed in the glass on at least one of the layers forming the door. The heater used in this embodiment is transparent and configured as film.

[0005] In the state of the art, embodiments are available wherein a liquid collection chamber is disposed at the lower side of the door so that the liquid, which flows by condensing on the door, does not damage the furniture. In some of these embodiments, additional elements directing the liquid, which drains from over the door, into the liquid collection chamber are situated. In some embodiments, the liquid is directed directly to the base of the oven cavity.

[0006] In the state of the art German Patent Application No. DE10044376, a cooking device is described comprising a sealing element which serves as a bridge between the body and the door when the door is closed. In this embodiment, some of the sealing element is at the lower side of the door and the rest is at the base of the casing. When the door is closed, the said two elements join and provide the liquid on the door to be delivered to the oven cavity.

[0007] In the state of the art German Patent Application No. DE102005024426, an oven is described comprising a discharge conduit disposed on the door gasket. The liquid coming by draining from the door is delivered to the said conduit by means of the guidance element and guided to the collection chamber disposed under the casing from there.

[0008] In the state of the art European Patent Application No. EP 1 918 644 A1, a cooking device is described comprising a door, a liquid collection chamber disposed at the lower side of the door and wherein droplets that form on an inner surface of the door spill by draining, and further comprising a liquid guidance means which is disposed in the vicinity of the lower edge of a door and which provides droplets coming from the surface of the door to be directed to the liquid collection chamber and/or to be accumulated on itself according to the opening angle of the door.

[0009] The aim of the present invention is the realization of a cooking device wherein the liquid droplets that form on the inner surface of the door during cooking are removed from the surface of the door.

[0010] The cooking device realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a liquid guidance means that removes the droplets that form on the door from the door and a liquid collection chamber wherein the liquid droplets that are removed from the door are collected.

[0011] The door of the cooking device can be in four different positions throughout and after cooking. The said positions are a closed position, an entirely open position perpendicular to the closed position, an intermediate position between the closed position and the entirely open position and an half-open position. The intermediate position is generally the position when the door is slightly opened for controlling the foods in the oven cavity. Preferably there is an angle of 20 degrees between the closed position and the intermediate position. The half-open position is almost in the middle of the entirely open position and the closed position.

[0012] On the inner surface of the door of the cooking device of the present invention, a liquid guidance means is situated. The liquid guidance means is disposed in a section near the lower side of the door. The liquid guidance means extends almost parallel to the base of the cooking device along the width of the door. When the door is in the closed position, the droplets that form therein directly reach the liquid collection chamber without contacting the liquid guidance means disposed at the lower side of the door. When the door is between the intermediate position and the half-open position, the liquid guidance means directs the droplets coming from the surface of the door to the liquid chamber by making the said droplets impact thereagainst and when the door is between the half-open position and the entirely open position, the liquid guidance means accumulates the coming droplets thereon by means of the liquid accumulation means it has.

[0013] In an embodiment of the present invention, the liquid guidance means extends starting from the lower surface of the door towards the level of the inner surface thereof in the vertical direction. In this embodiment, the liquid guidance means is shaped as an extension of the element which forms the lower surface of the door and carries the layers of the door thereon.

[0014] In another embodiment of the present invention, the liquid accumulation means is shaped as a groove that traverses from end to end the door in the horizontal
axis. When the door is between the half-open position and the entirely open position, the liquid that drips from the door fills in the groove-shaped liquid accumulation means. Each of both ends of the liquid accumulation means are closed by a wall and the liquid filling therein is prevented from overflowing from the sides. Since the liquid accumulation means acquires an inclination in the negative direction while the door is closed, the liquid therein spills into the liquid collection chamber.

[0015] In another embodiment of the present invention, a lip is disposed on the liquid guidance means, right in front of the liquid accumulation means, positioned so as to form the end portion of the liquid guidance means. When the door is between the intermediate position and the half-open position, the droplets that drain from the door are directed to the liquid collection chamber by impacting the lip of the liquid guidance means. The lip is preferably shaped as a flat plate.

[0016] The liquid guidance means can perform both the functions of directing and accumulating at the same time in any position according to the direction and force of the air flow in the cooking device. While some of the liquid that drips from the door fills in the groove-shaped liquid accumulation means, the rest spills into the liquid guidance chamber by impacting the lip.

[0017] In another embodiment of the present invention, the liquid guidance means is produced from sheet metal.

[0018] By means of the cooking device of the present invention, the liquid droplets, which form on the door of the cooking device and spill onto the furniture by acquiring angle when the door is opened, are provided to be effectively directed to the liquid collection chamber. The liquid guidance means used in the cooking device of the present invention provides guidance effective for each position of the door by making the liquid droplets impact the lip or accumulating them on the groove-shaped liquid accumulation means.

[0019] The cooking device 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 the cooking device.
- Figure 2 - is the schematic view of the cooking device when the door is in the closed position.
- Figure 3 - is the view of detail A in Figure 2.
- Figure 4 - is the cross-sectional view of the liquid guidance means and the liquid collection chamber when the door is in the closed position.
- Figure 5 - is the cross-sectional view of the liquid guidance means and the liquid collection chamber when the door is in the intermediate position.
- Figure 6 - is the cross-sectional view of the liquid guidance means and the liquid collection chamber when the door is in the half-open position.
- Figure 7 - is the cross-sectional view of the liquid guidance means and the liquid collection chamber when the door is in the entirely open position.
- Figure 8 - is the perspective view of the liquid guidance means.

[0020] The elements illustrated in the figures are numbered as follows:

6. Liquid accumulation means
5. Liquid guidance means
7. Lip
4. Liquid collection chamber
3. Door
2. Oven cavity
1. Cooking device

[0021] The cooking device (1) comprises an oven cavity (2) wherein the foods to be cooked are placed and a door (3) providing access into the oven cavity (2) (Figure 1).

[0022] The door (3) has a closed position (P_{C}) and an entirely open position (P_{O}) almost perpendicular to the closed position (P_{C}).

[0023] The cooking device (1) furthermore comprises at least one liquid accumulation chamber (4) disposed at the lower side of the door (3) and wherein the droplets that form on the inner surface of the door (3) spill by draining. During the cooking process, vapor forms on the inner surface of the door (3) due to the temperature difference between the door (3) and the oven cavity (2). After a while, vapor causes liquid droplets to form on the surface of the door (3) by condensing. The said liquid droplets leave the door (3) by draining downwards from the surface of the door (3) with the effect of gravity and accumulate in the liquid collection chamber (4) disposed right at the lower side of the door (3).

[0024] The cooking device (1) of the present invention comprises a liquid guidance means (5) which is disposed in the vicinity of the lower edge of the door (3) and which provides the droplets coming from the surface of the door (3) to be directed to the liquid collection chamber (4) and/or to be accumulated on itself according to the opening angle of the door (3) (Figure 2, Figure 3).

[0025] The liquid guidance means (5) of the present invention comprises a liquid accumulation means (6) which provides the droplets coming from the surface of the door (3) to be accumulated thereon according to the opening angle of the door (3).

[0026] According to the present invention, the door (3) has

- a half-open position (P_{2}) wherein the door (3) is almost half open and
- an intermediate position (P_{I}) wherein the opening angle of the door (3) is between the half-open position (P_{2}) and the closed position (P_{C}).

[0027] The liquid guidance means (5) directs the droplets coming from the surface of the
door (3) to the liquid collection chamber (4) when the door (3) is between the intermediate position (P1) and the half-open position (P2) and accumulates the droplets coming from the surface of the door (3) in the liquid accumulation means (6) when the door (3) is between the half-open position (P2) and the entirely open position (PO).

When the door (3) is in the closed position (PC), the droplets that form thereon directly reach the liquid collection chamber (4) without contacting the liquid guidance means (5) disposed at the lower side of the door (3). When the situation of the foods in the oven cavity (2) is desired to be seen during cooking, the door (3) is brought to the intermediate position (P1) by being slightly opened. While the door (3) is brought to the intermediate position (P1) from the closed position (PC), the separation angle of the liquid droplets, that drain from the door (3), from the door (3) does not change much and the liquid droplets continue to accumulate directly in the liquid collection chamber (4). When the oven cavity (2) is desired to be accessed, the door (3) is brought to the half-open position (P2) by being opened some more. During the movement of the door (3) from the intermediate position (P1) to the half-open position (P2), the droplets draining from the door (3) are directed to the liquid collection chamber (4) by impacting the liquid guidance means (5). When the tray disposed in the oven cavity (2) is desired to be taken out, the door (3) is brought to the entirely open position (PO) which is almost perpendicular to the closed position (PC). When the door (3) is between the half-open position (P2) and the entirely open position (PO), the liquid droplets that drip from the door (3) separate from the door (3) with a greater angle and accumulate on the liquid accumulation means (6) since the liquid droplets are not able to reach the liquid collection chamber (4). Afterwards, when the door (3) is brought to the closed position (PC) again, the liquid that accumulates on the liquid accumulation means (6) is emptied into the liquid collection chamber (4). In each of the three positions, the movement of the liquid ends in the liquid collection chamber (4). The liquid collected in the liquid collection chamber (4) mixes into the air in the oven cavity (2) by evaporating by means of the high temperature in the cooking device (1). Thus, the liquid is prevented from dripping onto the furniture in all positions of the door (3) (Figure 4, Figure 5, Figure 6, Figure 7).

In an embodiment not covered by the present invention, there is an angle of almost 20 degrees between the intermediate position (P1) and the closed position (PC) of the door (3). In the said embodiment, there is an angle of almost 45 degrees between the half-open position (P2) and the closed position (PC). By means of the arrangements performed on the hinge system, the door (3) can stay at the said two points while being brought to the entirely open position (PO) from the closed position (PC).

In an embodiment of the present invention, the liquid guidance means (5) extends from the lower surface of the door (3) towards the inner surface vertical level of the door (3). Thus, when the door (3) is between the closed position (PC) and the intermediate position (P1), the liquid droplets that separate from the surface of the door (3) can be directed to the liquid collection chamber (4) without impacting the liquid guidance means (5). In this embodiment, the liquid guidance means (5) is produced as an extension of the element that forms the lower surface of the door (3). When the door (3) is between the half-open position (P2) and the entirely open position (PO), the liquid droplets that separate from the door (3) fill in the groove-shaped liquid accumulation means (6). While the door (3) is brought to the closed position (PC) again, the liquid that accumulates in the liquid accumulation means (6) is emptied into the liquid collection chamber (4). In this embodiment, both ends of the liquid accumulation means (6) are closed such that the liquid therein does not flow from the sides (Figure 8).

In another embodiment of the present invention, the liquid guidance means (5) comprises a lip (7) against which the droplets coming from the surface of the door (3) impact and are directed to the liquid collection chamber (4). When the door is brought from the intermediate position to the half-open position, the lip (7) is disposed at the front side of the liquid accumulation means (6). The lip (7), which is shaped as a flat plate forms the end portion of the liquid guidance means (5). While the door (3) is brought from the intermediate position (P1) to the half-open position (P2), the droplets that separate from the door (3) are directed to the liquid collection chamber (4) by flowing over the lip (7) (Figure 8).

In another embodiment of the present invention, the liquid guidance means (5) is produced from sheet metal. Thus, the liquid guidance means (5) is not affected by the high temperature in the cooking device (1). Moreover, the production costs of the elements are prevented from increasing since the sheet metal is a low cost material.

By means of the cooking device (1) of the present invention, the liquid droplets that form on the inner surface of the door (3) during the cooking process are provided to be effectively directed in all positions of the door (3) and prevented from damaging the furniture by spilling thereon.
Claims

1. A cooking device (1) comprising an oven cavity (2) wherein the foods to be cooked are placed, a door (3) providing access into the oven cavity (2) having a closed position (PC) and an entirely open position (PO) almost perpendicular to the closed position (PC) and further having a half-open position (P2) wherein the door (3) is almost half open and an intermediate position (P1) wherein the opening angle of the door (3) is between the half-open position (P2) and the closed position (PC) and said cooking device (1) further comprising at least one liquid collection chamber (4) disposed at the lower side of the door (3) and wherein the droplets that form on the inner surface of the door (3) spill by draining, said cooking device (1) further comprising a liquid guidance means (5) which is disposed in the vicinity of the lower edge of the door (3) and which provides the droplets coming from the surface of the door (3) to be directed to the liquid collection chamber (4) and/or to be accumulated on itself according to the opening angle of the door (3), wherein the liquid guidance means (5) is having a liquid accumulation means (6) which provides the droplets coming from surface of the door (3) to be accumulated on itself, wherein the liquid guidance means (5) directs the droplets coming from the surface of the door (3) to the liquid collection chamber (4) when the door (3) is between the intermediate position (P1) and the half-open position (P2) and accumulates the droplets coming from the door (3) surface in the liquid accumulation means (6) when coming from the door (3) surface in the liquid accumulation means (6) when the door is between the half-open position (P2) and the entirely open position (PO), characterized in that when the door (3) is in its closed position (PC), the droplets that form on the door (3) directly reach the liquid collection chamber (4) without contacting the liquid guidance means (5).

2. A cooking device as in Claim 1, characterized by the liquid guidance means (5) which extends from the lower surface of the door (3) towards the inner surface vertical level thereof.

3. A cooking device (1) as in Claim 1 or 2, characterized by the liquid accumulation means (6) shaped as a groove.

4. A cooking device (1) as in any one of the above claims, characterized by the liquid guidance means (5) having a lip (7) against which the droplets coming from the surface of the door (3) impact and are directed to the liquid collection chamber (4) when the door (3) is brought from the intermediate position (P1) to the half-open position (P2).

5. A cooking device (1) as in any one of the above claims, characterized by the liquid guidance means (5) produced from sheet metal.

Patentsprüche

1. Ein Kochgerät (1) bestehend aus einem Ofenhohlraum (2) wo die gekochten Nahrungsmittel abgelegt werden, einer Tür (3), die sicherstellt den Zugang in den Ofenhohlraum (2) mit einer geschlossenen Position (PC) und einer vollkommen offenen Position (PO), beinahe senkrecht zur geschlossenen Position (PC) und einer halboffenen Position (P2), wo die Tür (3) beinahe halboffen ist und einer zwischenliegenden Position (P1) wo der Öffnungswinkel der Tür (3) zwischen halboffenen Position (P2) und geschlossener Position (PC) ist und das besagte Kochgerät (1) ferner beinhaltet mindestens eine Flüssigkeitsversammlungskammer (4) angeordnet an der unteren Seite der Tür (3) und wo die Tropfen, der sich auf der inneren Oberfläche der Tür (3) bilden, durch Entwässerung verschütten, das besagte Kochgerät (1) ferner beinhaltet ein Flüssigkeitsführungs mittel (5), das angeordnet ist in der Nähe von unterer Seite der Tür (3) und versorgt, da die Tropfen, die von Oberfläche der Tür (3) kommen, zur Flüssigkeitsversammlungskammer (4) geführt werden und/oder auf sich selbst eingesammelt werden bezüglich dem Öffnungswinkel der Tür (3), wo das Flüssigkeitsführungs mittel (5) besitzt ein Flüssigkeitsversammlungsmittel (6), das sicherstellt, daß die Tropfen, die von Oberfläche der Tür (3) kommen, auf sich selbst versammelt werden, wo das Flüssig keitsführungs mittel (5) führt die Tropfen, die von der Oberfläche der Tür (3) kommen, in die Flüssigkeitsversammlungskammer (4), wenn sich die Tür (3) zwischen zwischenliegender Position (P1) und halboffener Position (P2) befindet und einsammelt die Tropfen, die von Oberfläche der Tür (3) kommen, im Flüssigkeitsversammlungsmittel (6), wenn sie von der Oberfläche der Tür (3) in das Flüssigkeitsversammlungsmittel (6) kommen, wenn sich die Tür zwischen halboffener Position (P2) und vollkommen offener Position (PO) befindet, dadurch gekennzeichnet, daß falls die Tür (3) in ihrer geschlossenen Position (PC) ist, erreichen die Tropfen, die sich auf der Tür (3) bilden, die Flüssigkeitsversammlungskammer (4) unmittelbar, ohne mit Flüssigkeits-führungs mittel (5) in Kontakt zu kommen.

2. Ein Kochgerät nach Anspruch 1, dadurch gekennzeichnet, daß das Flüssigkeitsführungs mittel (5), das sich von unterer Oberfläche der Tür (3) zur deren inneren Oberfläche in vertikaler Ebene erstreckt.

3. Ein Kochgerät (1) nach Ansprüchen 1 oder 2, dadurch gekennzeichnet, daß das Flüssigkeitsver-
sammlungsmittel (6) wie eine Rinne geformt ist.

4. Ein Kochgerät (1) nach den vorhergehenden Ansprüchen, **durch gekennzeichnet, daß** das Flüssigkeitsführungsmittel (5) einen Rand (7) besitzt, gegen den die Tropfen, die von der Oberfläche der Tür (3) kommen, anstoßen und werden zur Flüssigkeitsversammlungskammer (4) geführt, wenn die Tür (3) von zwischenliegender Position (P₁) zur halboffener Position (P₂) angebracht wird.

5. Ein Kochgerät (1) nach den vorhergehenden Ansprüchen, **durch gekennzeichnet, daß** das Flüssigkeitsversammlungsmittel (5) aus Metallblech produziert wird.

**Revendications**

1. Dispositif de cuisson (1) comprenant une cavité de four (2) dans laquelle les aliments à cuire sont placés, une porte (3) donnant accès à la cavité du four (2) ayant une position fermée (P₃) et une position entièrement ouverte (P₅) presque perpendiculaire à la position fermée (P₃) et ayant en outre une position semi-ouverte (P₂) dans lequel la porte (3) est presque à moitié ouverte et une position intermédiaire (P₁) dans lequel l’angle d’ouverture de la porte (3) est compris entre la position semi-ouverte (P₂) et la position fermée (P₃) et ledit dispositif de cuisson (1) comprenant en outre au moins une chambre de collecte de liquide (4) disposée sur le côté inférieur de la porte (3) et dans lequel les gouttelettes qui se forment sur la surface interne de la porte (3) se déversent en s’égouttant, ledit dispositif de cuisson (1) comprenant en outre un moyen de guidage de liquide (5) qui est disposé à proximité du bord inférieur de la porte (3) et ce qui permet de diriger les gouttelettes provenant de la surface de la porte (3) vers la chambre de collecte de liquide (4) et / ou de s’accumuler sur elle-même en fonction de l’angle d’ouverture de la porte (3), dans lequel le moyen de guidage de liquide (5) compte un moyen d’accumulation de liquide (6) qui fournit les gouttelettes provenant de la surface de la porte (3) à accumuler sur elle-même, dans lequel les moyens de guidage de liquide (5) dirigent les gouttelettes provenant de la surface de la porte (3) vers la chambre de collecte de liquide (4) lorsque la porte (3) est entre la position intermédiaire (P₁) et la demi-cavité position ouverte (P₂) et accumule les gouttelettes provenant de la surface de la porte (3) dans les moyens d’accumulation de liquide (6) lorsqu’elle est entre la position semi-ouverte (P₂) et la position entièrement ouverte (P₅) et **caractérisé en ce que** lorsque la porte (3) est dans sa position fermée (P₃) les gouttelettes qui se forment sur la porte (3) atteignent directement la chambre de collecte de liquide (4) sans entrer en contact avec les moyens de guidage de liquide (5).

2. Dispositif de cuisson selon la revendication 1, **caractérisé par** les moyens de guidage de liquide (5) qui s’étendent de la surface inférieure de la porte (3) vers le niveau vertical de la surface intérieure de celle-ci.

3. Disposition de cuisson (1) selon la revendication 1 ou 2, **caractérisé par** le moyen d’accumulation de liquide (6) en forme de rainure.

4. Dispositif de cuisson (1) selon l’une quelconque des revendications précédentes, **caractérisé en ce que** les moyens de guidage de liquide (5) comportent une lèvre (7) contre laquelle les gouttelettes provenant de la surface de la porte (3) impactent et sont dirigées vers le côté de la chambre de collecte de liquide (4) lorsque la porte (3) est amenée de la position intermédiaire (P₁) à la position semi-ouverte (P₂).

5. Dispositif de cuisson (1) selon l’une quelconque des revendications précédentes, **caractérisé par** les moyens de guidage de liquide (5) réalisés en tôle.
REFERENCES CITED IN THE DESCRIPTION

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