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(54) **AN OVEN WITH STEAM COOKING FUNCTION**

OFEN MIT DAMPFKOCHFUNKTION

FOUR À FONCTION DE CUISSON À LA VAPEUR

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## Description

**[0001]** The present invention relates to an oven wherein the steam cooking process is automatically performed.

**[0002]** In order to perform steam cooking in ovens where steam cooking can be performed, the user must check the oven preheating time in the user manual. When the oven preheating time is reached, the user fills the water tank with the required amount and places the same in position. In this embodiment, the user is required to control and perform parameters such as the cooking time, the amount of water to be put into the tank by constantly checking the user manual.

**[0003]** In some state of the art embodiments, the water tank is placed on the bottom of the oven. In this case, since the oven door is opened, it is exposed to heat and causes energy loss.

**[0004]** In the state of the art United States Patent Application No. US2005284460, in self-cleaning ovens, the shape memory spring is used to securely lock the oven door during the cleaning process at high temperatures (400° - 480°C).

**[0005]** In the state of the art United States Patent No. US6966582, the use of a shape memory spring mechanism is disclosed, in order to prevent the opening of the oven door at high temperatures so as to ensure security in self-cleaning ovens.

**[0006]** Prior art document US2014013963A1 discloses a steam cooking appliance according to the preamble of claim 1.

**[0007]** The aim of the present invention is the realization of an oven wherein the steam cooking process is automatically performed.

**[0008]** The oven realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body wherein the foodstuffs to be cooked are placed; a casing which surrounds the body; a water tank which is disposed between the casing and the body and which is filled by the user; a pipe with one end opening into the water tank and the other opening into the body and which provides the transfer of water vapor into the body; a valve which is disposed on the pipe and which provides the delivery of the water vapor into the body in a controlled manner; and a shape memory spring mechanism which enables the valve to open/closed according to the temperature in the body. By means of the present invention, the steam cooking process is automatically performed without requiring the intervention of the user. Since the user does not open the oven door, both safe use and energy savings are provided.

**[0009]** According to the present invention, heat transfer is required for the shape memory spring mechanism to reach the desired temperature. In order to realize this heat transfer, the oven comprises a spacer placed on the outer wall of the body. Thus, the body heat is transferred to the shape memory spring mechanism by conduction and the valve is opened or closed at the right temperature

and time. In this embodiment of the present invention, the spacer is manufactured from sheet metal.

**[0010]** According to the present invention, the spacer is L-shaped and has a first arm on the body outer wall which contacts the ceiling and a second arm which contacts the body side wall. Thus, an effective heat transfer is provided by means of a mechanical connection.

**[0011]** In another embodiment of the present invention, the first arm has one short and two long sides in contact with the ceiling on the outer wall of the body, and the spacer comprises a chamber between the first arm and the ceiling. In this embodiment, the gap formed between the first arm and the ceiling as a result of only the edges of the first arm contacting the ceiling is defined as a chamber filled with ambient air. The heat accumulated in said chamber is transferred to the shape memory spring mechanism. Thus, the heat in the body is transferred to the shape memory spring mechanism in the most effective and correct manner, and the valve opens automatically when the desired temperature is reached so as to ensure the performance of the steam cooking process and when the desired temperature is reached, the valve is closed and the steam cooking process is terminated.

**[0012]** An oven realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the general view of an oven.

Figure 2 - is the perspective view of a spacer.

**[0013]** The elements illustrated in the figures are numbered as follows:

1. Oven
2. Body
3. Valve
4. Shape memory spring mechanism
5. Pipe
6. Spacer
7. First arm
8. Second arm
9. Chamber
10. Slit
11. Water tank

**[0014]** The oven (1) comprises a body (2) wherein the foodstuffs to be cooked are placed; a casing which surrounds the body (2); a water tank (11) which is disposed between the casing and the body (2) and which is filled with water; a pipe (5) with one end opening into the water tank (11) and the other opening into the body (2) and which provides the transfer of water vapor into the body (2); a valve (3) which is disposed on the pipe (5) and which provides the delivery of the water vapor into the body (2) in a controlled manner; and a shape memory spring mechanism (4) which enables the valve (3) to open/closed according to the temperature in the body (2) (Figure 1).

**[0015]** By means of the present invention, the steam cooking process is automatically performed without requiring the intervention of the user. Since the user does not open the oven (1) door, both safe use and energy savings are provided.

**[0016]** According to the present invention, heat transfer is required for the shape memory spring mechanism (4) to reach the desired temperature. In order to realize this heat transfer, the oven comprises a spacer (6) which is placed on the outer wall of the body (2) and whereon the shape memory spring mechanism (4) is disposed. Thus, the body (2) heat is transferred to the shape memory spring mechanism (4) by conduction and the valve (3) is opened or closed at the right temperature and time. In this embodiment of the present invention, the spacer (6) is manufactured from sheet metal.

**[0017]** According to the present invention, the spacer is L-shaped and has a first arm (7) on the body (2) outer wall which contacts the ceiling and a second arm (8) which contacts the body (2) side wall. Thus, an effective heat transfer is provided by means of a mechanical connection (Figure 2).

**[0018]** In another embodiment of the present invention, the first arm (7) has one short and two long sides in contact with the ceiling on the outer wall of the body (2), and the spacer comprises a chamber between (9) the first arm (7) and the ceiling of the body (2). In this embodiment, the gap formed between the first arm (7) and the ceiling as a result of only the edges of the first arm (7) contacting the ceiling is defined as a chamber (9) filled with ambient air. The heat accumulated in said chamber (9) is transferred to the shape memory spring mechanism (4). Thus, the heat in the body (2) is transferred to the shape memory spring mechanism (4) in the most effective and correct manner, and the valve (3) opens automatically when the desired temperature is reached so as to ensure the performance of the steam cooking process and when the desired temperature is reached, the valve (3) is closed and the steam cooking process is terminated.

**[0019]** In another embodiment of the present invention, in the spacer (6), the edges of the first arm (7) contacting the body (2) ceiling are bent in a "V" form, thus allowing the spacer (6) to contact the body (2) ceiling only along a single line.

**[0020]** In another embodiment of the present invention, the valve (3) and the shape memory spring mechanism (4) are fixed on the spacer (6) by means of connection members.

**[0021]** In another embodiment of the present invention, the spacer (6) comprises at least one slit (10) on the first arm (7). The slit (10) enables the hot air in the chamber (9) to be transferred to the shape memory spring mechanism (4). In the preferred embodiment of the present invention, the spacer (6) comprises three slits (10) extending parallel to each other along the long side of the first arm (7).

**[0022]** By means of the present invention, the heat transfer required for the shape memory spring mechanism (4) to reach the desired temperature is performed in the most efficient manner.

## 5 Claims

1. An oven (1) **comprising** a body (2) wherein the foodstuffs to be cooked are placed; a casing which surrounds the body (2); a water tank (11) which is disposed between the casing and the body (2) and which is filled with water; a pipe (5) with one end opening into the water tank (11) and the other opening into the body (2) and which provides the transfer of water vapor into the body (2); and a valve (3) which is disposed on the pipe (5) and which provides the delivery of the water vapor into the body (2) in a controlled manner; wherein the oven comprises a shape memory spring mechanism (4) which enables the valve (3) to open/closed according to the temperature in the body (2) wherein a spacer (6) is placed on the outer wall of the body (2) and whereon the shape memory spring mechanism (4) is disposed, **characterized in that** the spacer (6) is L-shaped and has a first arm (7) on the body (2) outer wall which contacts the ceiling and a second arm (8) which contacts the body (2) side wall.
2. An oven (1) as in Claim 1, **characterized by** the spacer (6) which is manufactured from sheet metal.
3. An oven (1) as in Claim 1, **characterized by** the first arm (7) having one short and two long sides in contact with the ceiling on the outer wall of the body (2), and a chamber between (9) the first arm (7) and the ceiling of the body (2).
4. An oven (1) as in Claim 3, **characterized by** the first arm (7) of which the edges contacting the body (2) ceiling are bent in a "V" form.
5. An oven (1) as in any one of Claims 1 to 4, **characterized by** the spacer (6) comprising at least one slit (10) on the first arm (7).

## Patentansprüche

1. Ein Ofen (1) **umfasst** einen Körper (2), in dem die zu kochenden Lebensmittel platziert werden; ein Gehäuse, das den Körper (2) umgibt; einen Wassertank (11), der zwischen dem Gehäuse und dem Körper (2) angeordnet ist und der mit Wasser gefüllt ist; ein Rohr (5), dessen eines Ende in den Wassertank (11) und dessen anderes Ende in den Körper (2) mündet und das für die Übertragung von Wasserdampf in den Körper (2) sorgt; und ein Ventil (3), das auf dem Rohr (5) angeordnet ist und das die Abgabe des Wasserdampfes in den Körper (2) in kontrollier-

ter Weise gewährleistet; wobei der Ofen einen Formgedächtnis-Federmechanismus (4) umfasst, der es dem Ventil (3) ermöglicht, sich entsprechend der Temperatur in dem Körper (2) zu öffnen/zuschließen, wobei ein Abstandshalter (6) an der Außenwand des Körpers (2) angeordnet ist und an dem der Formgedächtnis-Federmechanismus (4) angeordnet ist, gekennzeichnet ist es dadurch, dass der Abstandshalter (6) L-förmig ist und einen ersten Arm (7) an der Außenwand des Körpers (2), der die Decke berührt, und einen zweiten Arm (8) aufweist, der die Seitenwand des Körpers (2) berührt.

2. Ein Ofen (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der Abstandshalter (6) aus Blech gefertigt ist.
3. Ein Ofen (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der erste Arm (7) eine kurze und zwei lange Seiten in Kontakt mit der Decke an der Außenwand des Körpers (2) und eine Kammer zwischen (9) dem ersten Arm (7) und der Decke des Körpers (2) aufweist.
4. Ein Ofen (1), wie in Anspruch 3 aufgeführt, **ist dadurch gekennzeichnet, dass** der erste Arm (7), dessen Kanten die Decke des Körpers (2) berühren, V-förmig gebogen ist.
5. Ein Ofen (1), wie in einem der Ansprüche 1 bis 4 aufgeführt, **ist dadurch gekennzeichnet, dass** der Abstandshalter (6) mindestens einen Schlitz (10) am ersten Arm (7) aufweist.

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## Revendications

1. Un four (1) **comportant** un corps (2) dans lequel sont placés les aliments à cuire ; une enceinte qui entoure le corps (2) ; un réservoir d'eau (11) qui est disposé entre l'enceinte et le corps (2) et qui est rempli d'eau ; un conduit (5) dont une extrémité s'ouvre dans le réservoir d'eau (11) et l'autre dans le corps (2) et qui assure le transfert de vapeur d'eau dans le corps (2) ; et une vanne (3) disposée sur le conduit (5) et qui assure l'acheminement de la vapeur d'eau dans le corps (2) de manière contrôlée; dans lequel le four comprend un mécanisme à ressort à mémoire de forme (4) permettant à la vanne (3) de s'ouvrir/se fermer en fonction de la température dans le corps (2), dans lequel une entretoise (6) est placée sur la paroi extérieure du corps (2) et sur laquelle est disposé le mécanisme à ressort à mémoire de forme (4), **caractérisé en ce que** l'entretoise (6) est en forme de L et présente un premier bras (7) sur la paroi extérieure du corps (2) qui est en contact avec le plafond et un deuxième bras (8) qui est en contact avec la paroi latérale du corps (2).

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2. Un four (1) selon la Revendication 1, **caractérisé par** l'entretoise (6) qui est fabriquée en tôle.

3. Un four (1) selon la Revendication 1, **caractérisé par** le premier bras (7) qui présente un côté court et deux côtés longs en contact avec le plafond sur la paroi extérieure du corps (2), et une cavité (9) entre le premier bras (7) et le plafond du corps (2).

4. Un four (1) selon la Revendication 3, **caractérisé par** le premier bras (7) dont les bords en contact avec le plafond du corps (2) sont pliés en forme de « V ».

5. Un four (1) selon l'une quelconque des revendications 1 à 4, **caractérisé par** l'entretoise (6) qui comprend au moins une fente (10) sur le premier bras (7).

Figure 1

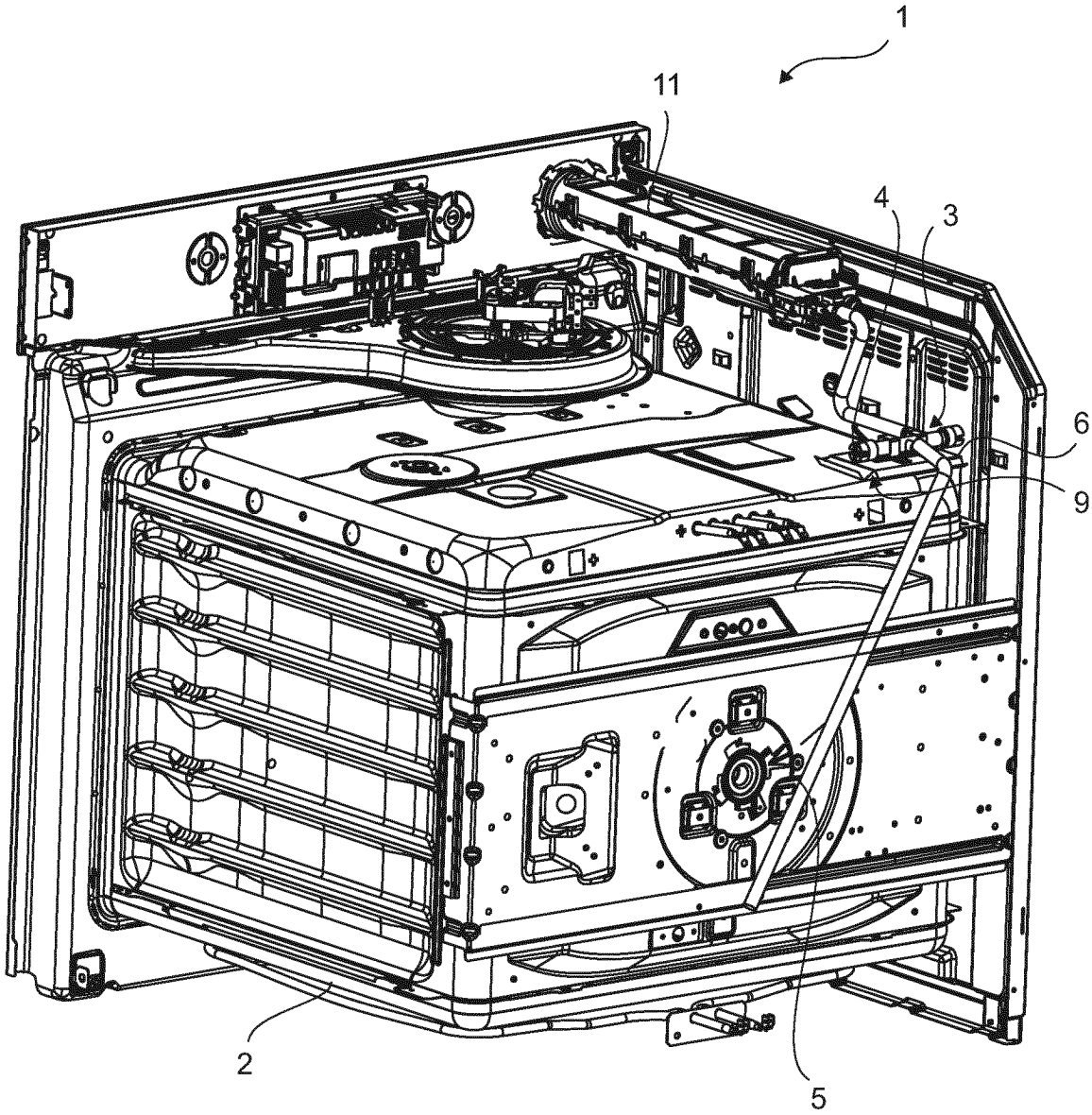
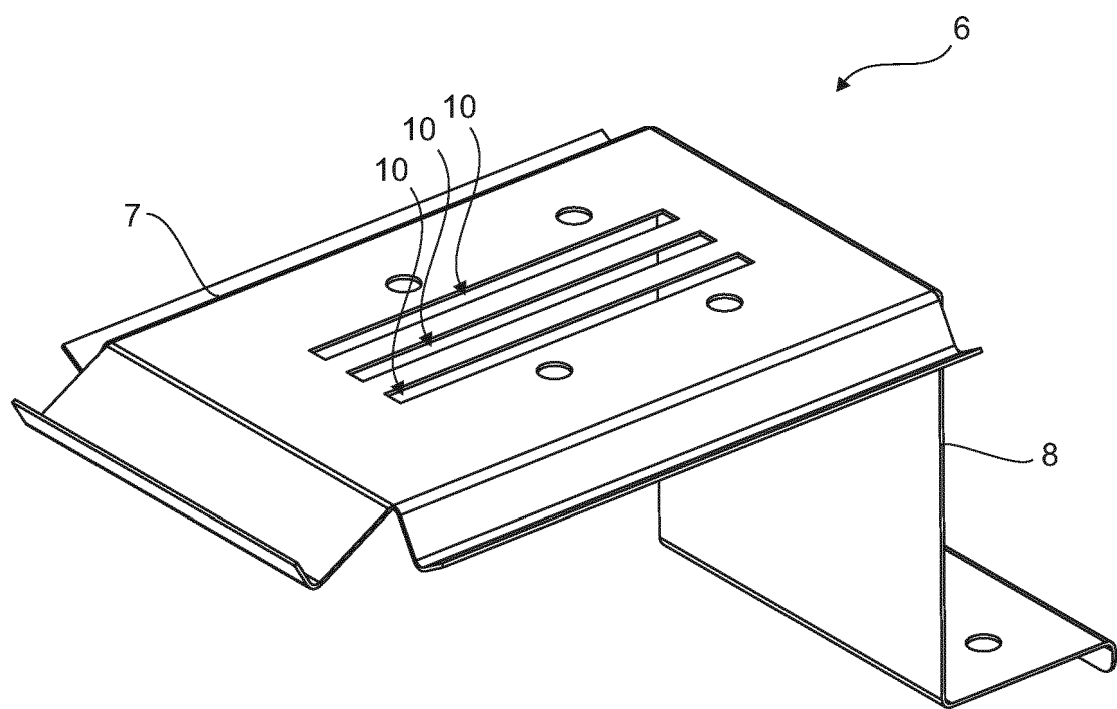


Figure 2



**REFERENCES CITED IN THE DESCRIPTION**

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