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

(57) The present invention relates to 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); 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).

EP 4 276 366 A1

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

[0007] 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.

[0008] 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] In an embodiment of the present invention, the shape memory spring mechanism is positioned on the outer wall of the body.

[0010] In another embodiment of 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.

[0011] In another embodiment of the present invention, the oven comprises an L-shaped spacer, which 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.

[0012] In another embodiment of the present invention, the spacer comprises a first arm having one short and two long sides in contact with the ceiling on the outer wall of the body, and 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.

[0013] 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.

[0014] 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

[0015] 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).

[0016] 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.

[0017] In an embodiment of the present invention, the shape memory spring mechanism (4) is positioned on the outer wall of the body (2).

[0018] In another embodiment of 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.

[0019] In another embodiment of the present invention, the oven (1) comprises an L-shaped spacer (6), which 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).

[0020] In another embodiment of the present invention, the spacer (6) comprises a 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). 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.

[0021] 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.

[0022] 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.

[0023] 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).

[0024] 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.

20 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; **characterized by** a shape memory spring mechanism (4) which enables the valve (3) to open/closed according to the temperature in the body (2).
2. An oven (1) as in Claim 1, **characterized by** the shape memory spring mechanism (4) which is positioned on the outer wall of the body (2).
3. An oven (1) as in Claim 1 and 2, **characterized by** a spacer (6) which is placed on the outer wall of the body (2) and whereon the shape memory spring mechanism (4) is disposed.
4. An oven (1) as in Claim 3, **characterized by** the spacer (6) which is manufactured from sheet metal.
5. An oven (1) as in Claim 3, **characterized by** an L-shaped spacer (6), which 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.
6. An oven (1) as in Claim 5, **characterized by** the spacer (6) comprising a 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).

7. An oven (1) as in Claim 5 and 6, **characterized by** the first arm (7) of which the edges contacting the body (2) ceiling are bent in a "V" form.
8. An oven (1) as in any one of Claims 5 to 7, **characterized by** the spacer (6) comprising at least one slit (10) on the first arm (7).

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Figure 1

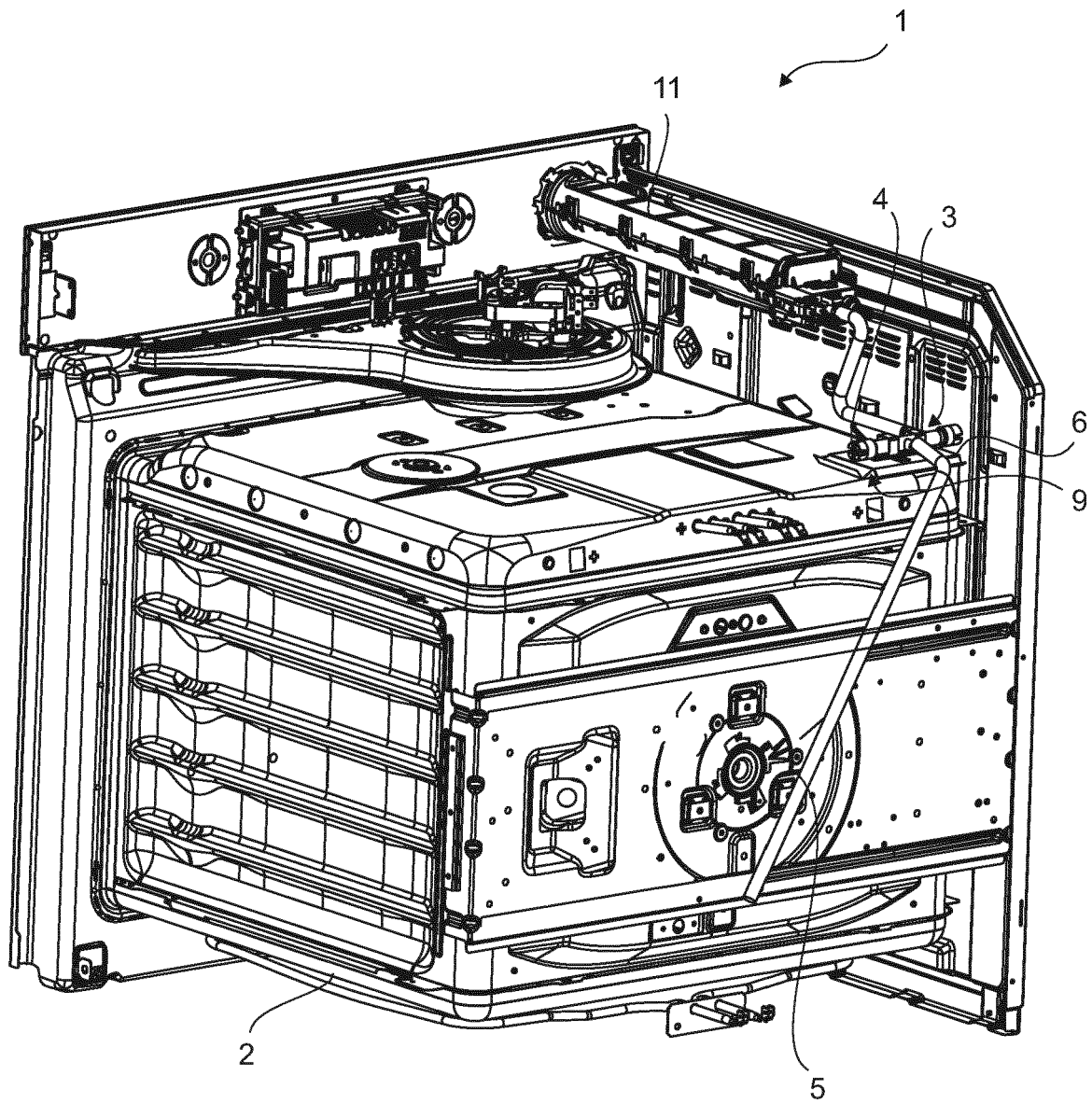
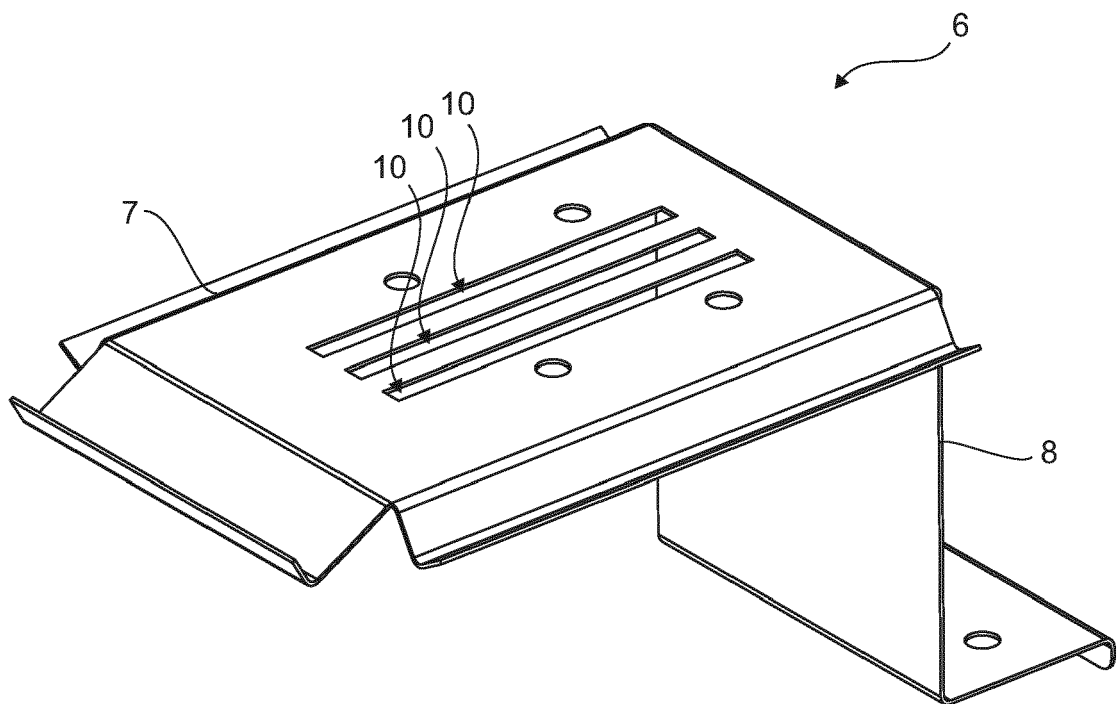


Figure 2





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Application Number

EP 23 16 5447

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EPO FORM 1503 03.82 (P04C01)

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A	* paragraph [0041]; figures 2-5 *	5-8	
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		8 September 2023	Fest, Gilles
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 23 16 5447

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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