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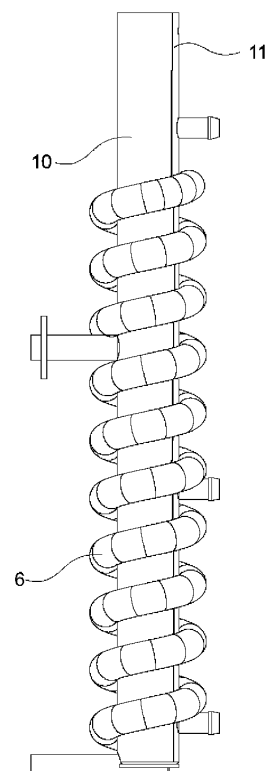
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(54) **A COOKING DEVICE**

(57) The present invention relates to a cooking device (1) comprising a body (2); a cooking chamber (3) which is disposed in the body (2) and wherein the foodstuffs to be cooked are placed; a casing (4) which is a box with an open front side, surrounding the cooking chamber (3); a steam generator (5) which is provided on the body (2) and which provides the generation of the steam to be sent onto the foodstuff during the cooking process; a water delivery line (6) which is provided on the body (2) so as to be connected to the mains line (S) at one end and which enables the water to be delivered to the steam generator (5); and a discharge duct assembly (7) disposed on the body (2) and having at least one opening (8) and at least one chimney duct (10) which enables the process air in the cooking chamber (3) during the cooking process to be moved by means of a chimney motor (9) and discharged through the opening (8), wherein the water delivery line (6) is positioned so as to be close to the chimney duct (10) at at least one region so as to allow heat transfer between the former and the chimney duct (10).

Figure 3



Description

[0001] The present invention relates to a cooking device.

[0002] Today cooking devices are used for preparing foodstuffs by means of processes such as heating, cooking, etc. The oven is one of the most frequently used devices to prepare foodstuffs. In ovens, the cooking process is generally performed by sending the air heated by the heaters placed onto the ceiling, the base or the rear wall of the cooking chamber towards the foodstuffs placed in the cooking chamber. In cooking devices with steam cooking function, the steam is generated by heating the water taken from the mains line by means of the steam generator and the steam cooking is realized by transferring the steam into the cooking chamber. The steam in the cooking chamber has to be discharged after the cooking process. In the state of the art, there are cooking devices having different discharge systems which enable the waste heat and steam in the cooking chamber to be discharged. Waste heat and steam are discharged directly to the outer environment. However, condensation may occur on the surface of the cooking device during the discharge of the steam with high relative humidity and the nearby components may be damaged due to the high temperature of the discharge system. Furthermore, energy consumption increases since the water taken from the mains line to be used for steam generation is at low temperatures.

[0003] In the state of the art European Patent Application No. EP1909038, a cooking device is disclosed, comprising a steam generator.

[0004] The aim of the present invention is the realization of a cooking device wherein the water is enabled to enter the steam generator at higher temperatures with respect to the mains line and thus, the energy consumption is reduced.

[0005] 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 body; a cooking chamber which is disposed in the body and wherein the foodstuffs to be cooked are placed; and a casing which is a box with an open front side, surrounding the cooking chamber. A steam generator is provided on the body for generating the steam to be delivered sent onto the foodstuffs during the cooking process, enabling the steam cooking process to be performed. The water taken from the mains line by means of a water delivery line which is connected to the mains line at one end is enabled to be transferred to the steam generator for steam generation. On the body, a chimney duct system is provided, comprising a chimney motor which circulates the process air in the cooking chamber during the cooking process and at least one chimney duct enabling the process air to be discharged through at least one opening.

[0006] The cooking device of the present invention comprises the water delivery line which is connected to the chimney duct at one end and which enables the heat

in the chimney duct to be transferred to the water taken from the mains line. The high amount of heat in the chimney duct is transferred to the water taken from the mains line and the steam generator is enabled to be supplied with water at higher temperatures. Thereby, the amount of energy consumed by the steam generator to heat the water for steam generation is decreased and energy saving is provided.

[0007] In an embodiment of the present invention, the cooking device comprises the water delivery line which surrounds the chimney duct. Thus, the amount of heat which is transferred from the chimney duct to the water in the water delivery line is increased as a result of the increase in the contact surface between the water delivery line and the chimney duct.

[0008] In another embodiment of the present invention, the cooking device comprises the chimney duct, the inner surface of which is coated with a film. Thus, due to the surface tension which is increased by means of the film, the condensation of the process air in the chimney duct increases and the humidity of the discharged air decreases.

[0009] In another embodiment of the present invention, the cooking device comprises a sensing member which is provided on the water delivery line and which enables the temperature of the water taken from the mains line to be detected. The cooking device comprises a control unit which controls the operation of the chimney motor to be controlled based on the data obtained by means of the sensing member. When the temperature value detected by the sensing member is lower than the temperature value predetermined by the producer, the control unit accelerates the circulation of the air in the chimney duct by enabling the chimney motor to be activated or operated at a higher speed and the heat transfer to the water delivery line which contacts the chimney duct is accelerated.

[0010] In another embodiment of the present invention, the cooking device comprises the chimney duct which is produced from a material with high heat conductivity. Thus, the amount of heat transfer from the chimney duct to the water delivery line is increased.

[0011] By means of the present invention, a cooking device is realized, wherein, the amount of energy consumed by the steam generator is decreased by transferring the waste heat produced in the cooking chamber during the cooking process and intended to be discharged through the chimney duct to the water which is delivered to the steam generator for steam generation.

[0012] 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 front view of a cooking device.

Figure 2 - is the schematic view of the cooking device comprising the chimney duct and the steam generator in an embodiment of the present invention.

Figure 3 - is the perspective view of the water delivery line in contact with the chimney duct in an embodiment of the present invention.

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

1. Cooking device
2. Body
3. Cooking chamber
4. Casing
5. Steam generator
6. Water delivery line
7. Chimney duct assembly
8. Opening
9. Chimney motor
10. Chimney
11. Film
12. Sensing member
13. Control unit

S - Mains line

[0014] The cooking device (1) comprises a body (2); a cooking chamber (3) which is disposed in the body (2) and wherein the foodstuffs to be cooked are placed; a casing (4) which is a box with an open front side, surrounding the cooking chamber (3); a steam generator (5) which is provided on the body (2) and which provides the generation of the steam to be sent onto the foodstuff during the cooking process; a water delivery line (6) which is provided on the body (2) so as to be connected to the mains line (S) at one end and which enables the water to be delivered to the steam generator (5); and a discharge duct assembly (7) disposed on the body (2) and having at least one opening (8) and at least one chimney duct (10) which enables the process air in the cooking chamber (3) during the cooking process to be moved by means of a chimney motor (9) and discharged through the opening (8).

[0015] The cooking device (1) of the present invention comprises the water delivery line (6) which is positioned so as to be close to the chimney duct (10) at at least one region so as to allow heat transfer between the former and the chimney duct (10). During the cooking process, the process air and the steam in the cooking chamber (3) are discharged to the outer environment through the discharge duct assembly (7). By means of the connection between the water delivery line (6) and the chimney duct (10), the heat in the air in the chimney duct (10) is transferred to the water in the water delivery line (6). Thereby, the temperature of the water increases and the amount of energy consumed for water heating during the steam generation process in the steam generator (5) decreases.

[0016] In an embodiment of the present invention, the cooking device (1) comprises the water delivery line (6) which surrounds the chimney duct (10). By means of in-

creasing the area of the surface of the water delivery line (6) in contact with the chimney duct (10), the amount of heat transferred from the air in the chimney duct (10) to the water delivery line (6) is increased and the steam generator (5) is enabled to be supplied with water at higher temperatures.

[0017] In another embodiment of the present invention, the cooking device (1) comprises a film (11) which is arranged on the inner surface of the chimney duct (10). The film (11) increases the surface tension in the chimney duct (10). Due to the increased surface tension, the amount of condensation in the chimney duct (10) increases and the humidity of the discharged air decreases. Furthermore, the surface of the cooking device (1) is prevented from being damaged.

[0018] In another embodiment of the present invention, the cooking device (1) comprises a sensing member (12) which is provided on the water delivery line (6) and which detects the temperature of the water taken from the mains line (S), and a control unit (13) which controls the operation of the chimney motor (9) based on the data received from the sensing member (9). The control unit (13) compares the temperature value determined by means of the sensing member (12) with the temperature value predetermined by the producer and regulates the amount of heat transferred to the surface of the chimney duct (10) by changing the speed of the chimney motor (9).

[0019] In another embodiment of the present invention, the cooking device (1) comprises the chimney duct (10) which is produced from a material with high heat conductivity. Thus, the amount of heat present on the surface of the chimney duct (10) is increased and the amount of heat transferred to the water in the water delivery line (6) is increased.

[0020] By means of the present invention, the temperature of the water delivered to the steam generator (5) by means of the water delivery line (6) is increased. Thus, the amount of energy consumed by the steam generator (5) to heat the water for steam generation is decreased.

Claims

1. A cooking device (1) comprising a body (2); a cooking chamber (3) which is disposed in the body (2) and wherein the foodstuffs to be cooked are placed; a casing (4) which is a box with an open front side, surrounding the cooking chamber (3); a steam generator (5) which is provided on the body (2) and which provides the generation of the steam to be sent onto the foodstuff during the cooking process; a water delivery line (6) which is provided on the body (2) so as to be connected to the mains line (S) at one end and which enables the water to be delivered to the steam generator (5); and a discharge duct assembly (7) disposed on the body (2) and having at least one opening (8) and at least one chimney duct (10) which enables the process air in the cooking chamber (3)

during the cooking process to be moved by means of a chimney motor (9) and discharged through the opening (8), **characterized by** the water delivery line (6) which is positioned so as to be close to the chimney duct (10) at at least one region so as to allow heat transfer between the former and the chimney duct (10). 5

2. A cooking device (1) as in Claim 1, **characterized by** the water delivery line (6) which surrounds the chimney duct (10). 10
3. A cooking device (1) as in any one of the above claims, **characterized by** a film (11) which is disposed on the inner surface of the chimney duct (10). 15
4. A cooking device (1) as in any one of the above claims, **characterized by** a sensing member (12) which is provided on the water delivery line (6) and which detects the temperature of the water taken from the mains line (S), and a control unit (13) which controls the operation of the chimney motor (9) based on the data received from the sensing member (9). 20
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5. A cooking device (1) as in any one of the above claims, **characterized by** the chimney duct (10) which is produced from a material with high thermal conductivity. 30

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Figure 1

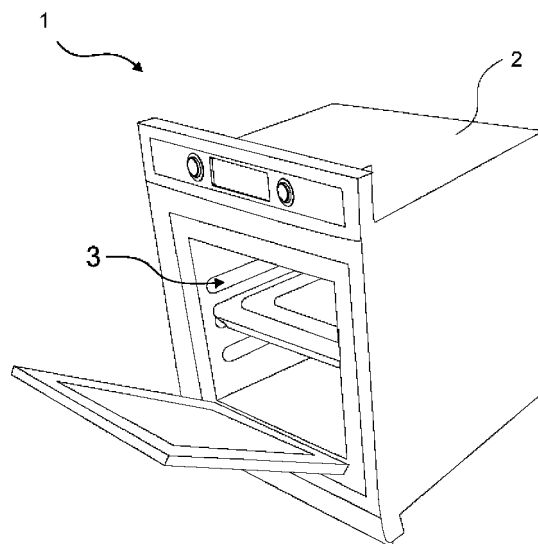


Figure 2

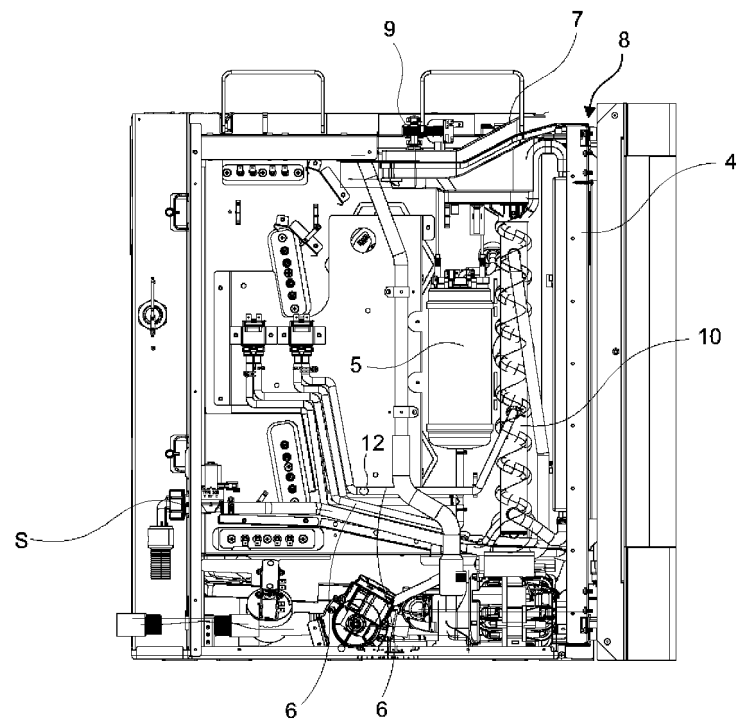
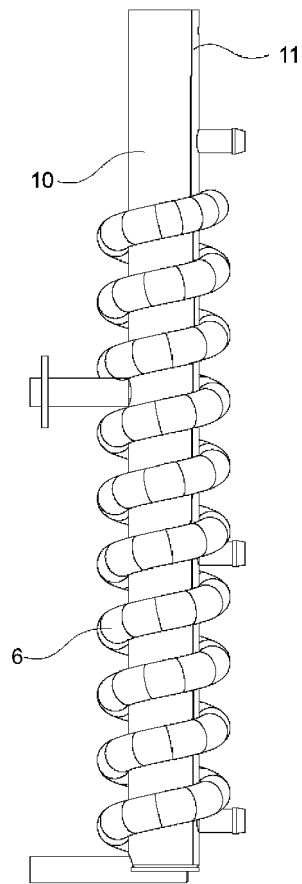


Figure 3





EUROPEAN SEARCH REPORT

Application Number
EP 20 19 9423

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Place of search The Hague		Date of completion of the search 5 February 2021	Examiner Fest, Gilles
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