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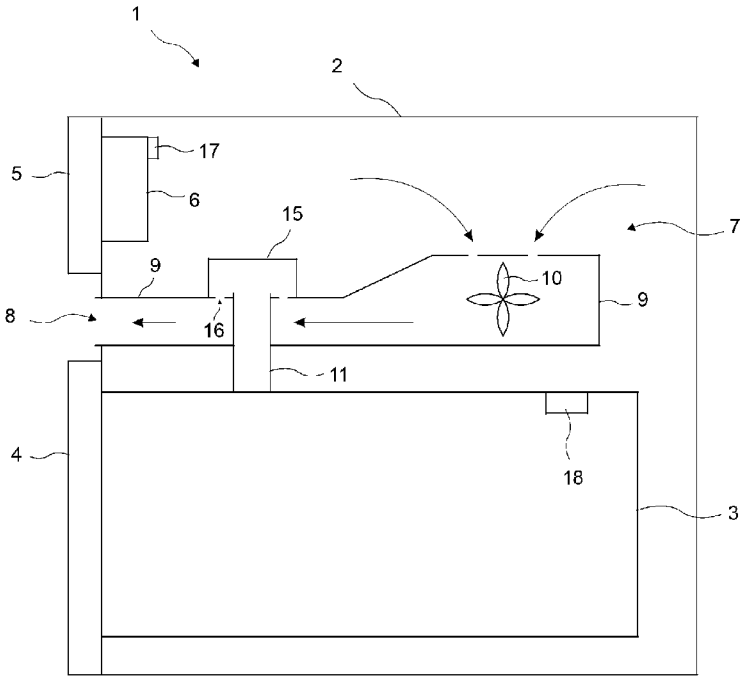
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(54) **Title**: OVEN WITH A VENTILATING DUCT

Figure 1



(57) **Abstract**: The present invention relates to an oven (1) comprising a cooking chamber (3) wherein the cooking process is performed, a control unit (6) disposed behind the front panel (5) containing the electronic elements, a ventilating duct (9) disposed at the upper side of the cooking chamber (3), having an outlet opening (8) opening to the outside surrounding from between the door (4) and the front panel (5), a fan (10) disposed inside the ventilating duct (9) providing the air sucked from the space (7) to be discharged to the outside through the outlet opening (8) by delivering it to the ventilating duct (9) and an exhaust device (11) that extends from the cooking chamber (3) into the ventilating duct (9) in the vertical direction and provides the humid air in the cooking chamber (3) to be discharged.

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Description

OVEN WITH A VENTILATING DUCT

[0001] The present invention relates to an oven comprising a fan and ventilating duct providing the electronic elements to be cooled.

[0002] In ovens, the electronic elements situated in the control panel are cooled by means of a cooling fan and a ventilating duct disposed at the upper side of the casing enclosing the cooking chamber. The cooling fan furthermore speeds up the discharge to the outside of the hot and humid air passing from the chimney to the cooling duct in the cooking process. If the cooling fan operates more than necessary for keeping the electronic elements within the desired temperature limits, the heat in the cooking chamber is discharged outside and energy consumption increases. If the cooling fan operates less, then the electronic elements cannot be cooled as required and moreover the cooking time is prolonged and cooking quality decreases since sufficient amount of humidity cannot be aspirated from the cooking chamber.

[0003] In the state of the art United States Patent No. US5500508, a self cleaning pyrolytic oven is explained. The air flow passing from the exhaust opening is automatically adjusted by means of a throttle disposed over the exhaust opening of the oven.

[0004] The aim of the present invention is the realization of an oven that comprises a fan and ventilating duct providing the electronic elements to be cooled and wherein loss of heat from the cooking chamber to the outside is prevented.

[0005] The oven realized in order to attain the aim of the present invention and explicated in the first claim and the respective claims thereof, comprises a ventilating duct disposed at the space at the upper side of the cooking chamber and provides the discharge of air sucked from the inside of the oven by the fan to the outside surrounding and an exhaust device that extends from the cooking chamber to the inside of the ventilating duct in the vertical direction and opens to the space inside the oven from above the ventilating duct and a cap closed on the exhaust device and that prevents the exhaust device from aspirating excess amount of humid and

hot air from the cooking chamber by the air curtain effect created therein.

[0006] Air passage holes are disposed on the ventilating duct between the exhaust device and the cap side wall surrounding thereof, allowing air to pass from the ventilating duct to the cap cavity or from the cap cavity to the ventilating duct.

[0007] In the oven of the present invention, the hot and humid air in the cooking chamber is prevented from being excessively discharged to the outside by the cap when the fan is in the operating mode. The fan does not operate when vapor needs to be discharged to the outside from the cooking chamber.

[0008] In an embodiment of the present invention, the oven comprises a heat sensor disposed in the vicinity of the control unit and the control unit that activates the fan in case the temperature of the electronic elements exceeds a limit value. The fan is operated only when the electronic elements in the control unit need to be cooled and as long as the fan operates, the hot and humid air in the cooking chamber is prevented from being discharged to the outside by means of the air curtain created in the cap.

[0009] In another embodiment of the present invention, the oven comprises a humidity sensor disposed in the cooking chamber and the control unit that deactivates the fan when the amount of humidity in the cooking chamber exceeds a limit value. In this embodiment, the vapor in the cooking chamber is discharged to the outside by natural convection.

[0010] In another embodiment of the present invention, the width size of the cap is greater than the width size of the exhaust device.

[0011] In another embodiment of the present invention, the cap is cup-shaped.

[0012] In another embodiment of the present invention, the cap is shaped as square or rectangular prism with one surface open.

[0013] In the oven of the present invention, the electronic elements in the control unit are provided to be effectively cooled and energy saving is provided by preventing excessive amount of hot air to be discharged to the outside from the inside of the cooking chamber with the air curtain effect created by the cap disposed on the exhaust device.

[0014] The oven realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0015] Figure 1 - is the schematic view of an oven.

[0016] Figure 2 - is the cross sectional view of a cap.

[0017] Figure 3 - is the schematic view of air flow in the ventilating duct and the exhaust device of an oven while the fan operates.

[0018] Figure 4 - is the schematic view of air flow in the ventilating duct and the exhaust device of an oven when the fan does not operate.

[0019] Figure 5 - is the perspective view of a cup-shaped cap.

[0020] Figure 6 - is the schematic view of a cap in square or rectangular prism shape.

[0021] The elements illustrated in the figures are numbered as follows:

[0022] 1. Oven

[0023] 2. Exterior body

[0024] 3. Cooking chamber

[0025] 4. Door

[0026] 5. Front panel

[0027] 6. Control unit

[0028] 7. Space

[0029] 8. Outlet opening

[0030] 9. Ventilating duct

[0031] 10. Fan

[0032] 11. Exhaust device

[0033] 12. Top wall

[0034] 13. Side wall

[0035] 14. Cavity

[0036] 15. Cap

[0037] 16. Air passage hole

[0038] 17. Heat sensor

[0039] 18. Humidity sensor

[0040] The oven (1) comprises an exterior body (2), a cooking chamber (3) wherein the cooking process is performed, a door (4) providing access into the cooking chamber (3), a front panel (5) situated at the upper side of the

door (4), a control unit (6) disposed behind the front panel (5) containing the electronic elements, a space (7) arranged between the exterior body (2) and the cooking chamber (3), a ventilating duct (9) disposed at the upper side of the cooking chamber (3), having an outlet opening (8) opening to the outside surrounding from between the door (4) and the front panel (5), a fan (10) disposed inside the ventilating duct (9) providing the air sucked from the space (7) to be discharged to the outside through the outlet opening (8) by delivering it to the ventilating duct (9).

[0041] The oven (1) of the present invention comprises:

[0042] - an exhaust device (11) that extends from the cooking chamber (3) into the ventilating duct (9) in the vertical direction and crosses the ventilating duct (9) transversely, opening to the space (7) from above, providing the humid air in the cooking chamber (3) to be discharged and

[0043] - a cap (15) which is disposed at the upper side of the exhaust device (11), shaped like an open bottom box, which has an upper wall (12) covering the upper side thereof and a side wall (13) seated on the ventilating duct (9), that surrounds the periphery of the exhaust device (11) by extending downwards from the upper wall (12) in the vertical direction and a cavity (14) enclosed by the upper wall (12) and the side wall (13) and which prevents excess amount of humid and hot air to be discharged from the cooking chamber (3) by creating the air curtain effect in the cavity (14) when the fan (10) operates.

[0044] The oven (1) furthermore comprises one or more air passage holes (16) opening over the ventilating duct (9), disposed between the exhaust device (11) and the side wall (13) surrounding it and allowing air to pass from the ventilating duct (9) to the cavity (14) or from the cavity (14) to the ventilating duct (9).

[0045] In an embodiment of the present invention, the oven (1) comprises at least two air passage holes (16) on the ventilating duct (9) disposed between the exhaust device (11) and the fan (10) and between the exhaust device (11) and the outlet opening (8).

[0046] When the fan (10) operates, the air sucked from the space (7) is delivered to the ventilating duct (9) and discharged to the outside surrounding from

the outlet opening (8). The discharge of hot and humid air in the cooking chamber (3) to the outside is prevented by the cap (15) when the fan (10) is in the operating mode. When the fan (10) operates, some of the air moving in the ventilating duct (9) enters into the cavity (14) inside the cap (15) by passing through the air passage hole (16). The cap (15) slows down the flow of air by means of the prismatic shape thereof formed with the upper wall (12) and the side walls (13) perpendicular to the upper wall (12) by forming a barrier in front of the air. The air entering into the cavity (14) prevents the exhaust device (11) from sucking air from the cooking chamber (3) by creating air curtain effect over the exhaust device (11) (Figure 3). Consequently, while the electronic elements in the control unit (6) are cooled effectively by the fan (10), heat loss is decreased and energy saving is provided at the same time by preventing excessive amount of hot air exiting from the cooking chamber (3) by means of the cap (15).

[0047] The fan (10) does not operate when vapor needs to be discharged to the outside from the cooking chamber (3). When the fan (10) does not operate, the vapor leaving the cooking chamber (3) fills into the cavity (14) inside the cap (15) by means of the exhaust device (11) and passes into the ventilating duct (9) through the air passage hole (16) since an air curtain effect is not encountered here and is discharged to the outside surrounding from here by means of the outlet opening (8) (Figure 4).

[0048] In an embodiment of the present invention, the oven (1) comprises a heat sensor (17) disposed in the vicinity of the control unit (6) and the control unit (6) that activates the fan (10) when the temperature of the electronic elements exceed a predetermined limit value (Figure 1). The fan (10) is operated only when the electronic elements in the control unit (6) need to be cooled and as long as it operates, prevents the hot and humid air in the cooking chamber (3) from being discharged to the outside by means of the air curtain created in the cap (15).

[0049] In an embodiment of the present invention, the oven (1) comprises a humidity sensor (18) disposed in the cooking chamber (3) and the control unit (6) that deactivates the fan (10) when the amount of humidity in the

cooking chamber (3) exceeds a predetermined limit value (Figure 1). When vapor discharge from the cooking chamber (3) is required, the fan (10) is deactivated and the vapor is discharged outside by natural convection.

[0050] In an embodiment of the present invention, the width size of the cap (15) is greater than the width size of the exhaust device (11).

[0051] In an embodiment of the present invention, the cap (15) is cup-shaped (Figure 5).

[0052] In an embodiment of the present invention, the cap (15) is shaped as square or rectangular prism with one surface open (Figure 6).

[0053] In the oven (1) of the present invention, the electronic elements in the control unit (6) are provided to be effectively cooled and excessive amount of hot air is prevented from being discharged from the inside of the cooking chamber (3) to the outside with the air curtain effect created by the cap (15) disposed over the exhaust device (11), thereby energy saving is provided by preventing heat loss.

[0054] 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 disclosed by the claims of the present invention.

Claims

1. An oven (1) **comprising** an exterior body (2), a cooking chamber (3) wherein the cooking process is performed, a control unit (6) containing the electronic elements, a space (7) arranged between the exterior body (2) and the cooking chamber (3), a ventilating duct (9) disposed at the upper side of the cooking chamber (3), having an outlet opening (8) opening to the outside surrounding, and a fan (10) disposed inside the ventilating duct (9) providing the air sucked from the space (7) to be discharged to the outside through the outlet opening (8) by delivering it to the ventilating duct (9), - **characterized by** - an exhaust device (11) that extends from the cooking chamber (3) into the ventilating duct (9) in the vertical direction and crosses the ventilating duct (9) transversely to open to the space (7) from above thereof and - a cap (15) disposed at the upper side of the exhaust device (11), shaped like an open bottom box, which has an upper wall (12) covering the upper side thereof and a side wall (13) seated on the ventilating duct (9) that surrounds the periphery of the exhaust device (11) by extending downwards from the upper wall (12) and a cavity (14) enclosed by the upper wall (12) and the side wall (13).
2. An oven (1) as in Claim 1, **characterized by** one or more air passage holes (16) opening over the ventilating duct (9), disposed between the exhaust device (11) and the side wall (13) surrounding it and allowing air to pass from the ventilating duct (9) to the cavity (14) or from the cavity (14) to the ventilating duct (9).
3. An oven (1) as in Claim 2, **characterized by** at least two air passage holes (16) disposed on the ventilating duct (9), between the exhaust device (11) and the fan (10) and between the exhaust device (11) and the outlet opening (8).
4. An oven (1) as in any one of the above Claims, **characterized by** a heat sensor (17) disposed in the vicinity of the control unit (6) and the control unit (6) that activates the fan (10) when the temperature of the electronic elements exceed a predetermined limit value.
5. An oven (1) as in any one of the above Claims, **characterized by** a humidity sensor (18) disposed in the cooking chamber (3) and the control unit (6) that deactivates the fan (10) when the amount of humidity in the cooking chamber (3) exceeds a predetermined limit value.

6. An oven (1) as in any one of the above Claims, **characterized by** the cap (15) the width size of which is greater than the width size of the exhaust device (11).
7. An oven (1) as in any one of the above Claims, **characterized by** the cup-shaped cap (15).
8. An oven (1) as in any one of the above Claims, **characterized by** the cap (15) shaped as square or rectangular prism with one side open.

Figure 1

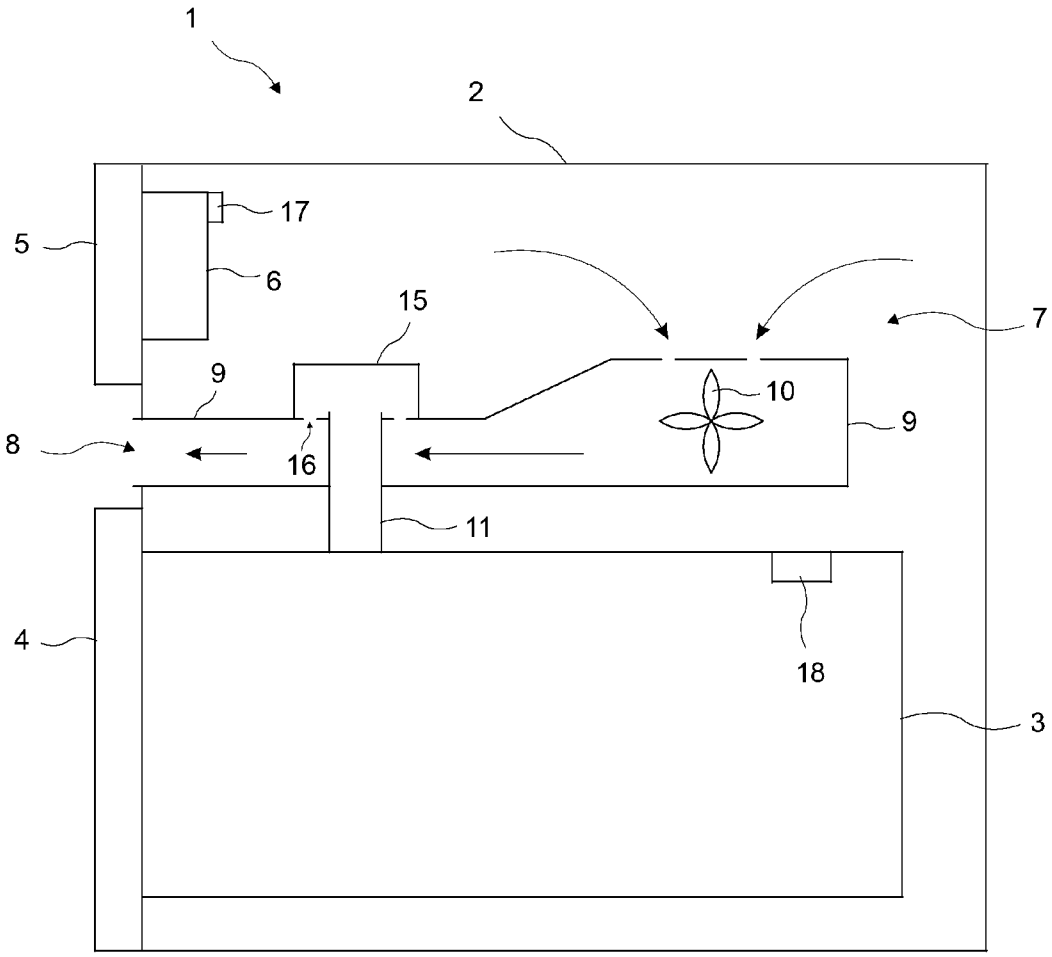


Figure 2

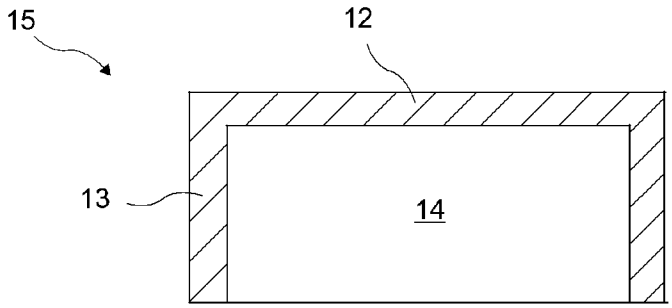


Figure 3

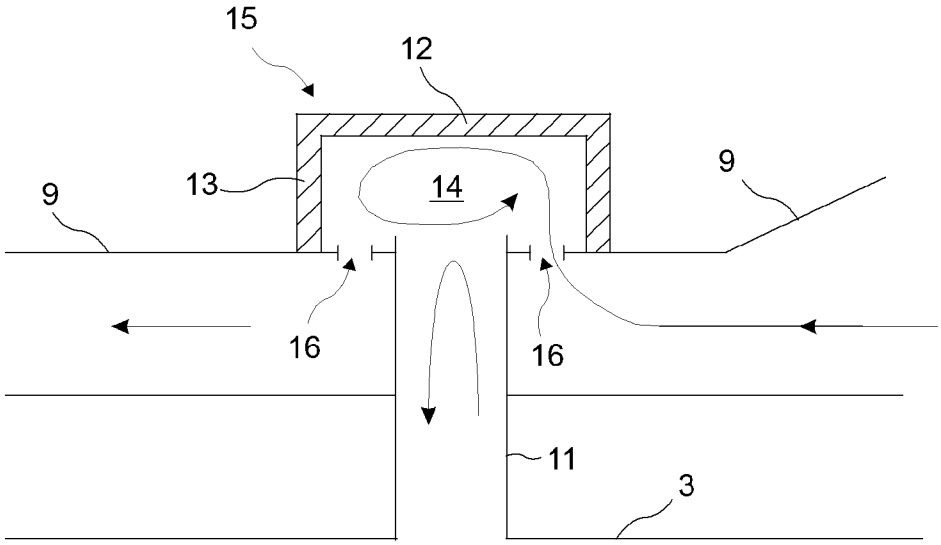


Figure 4

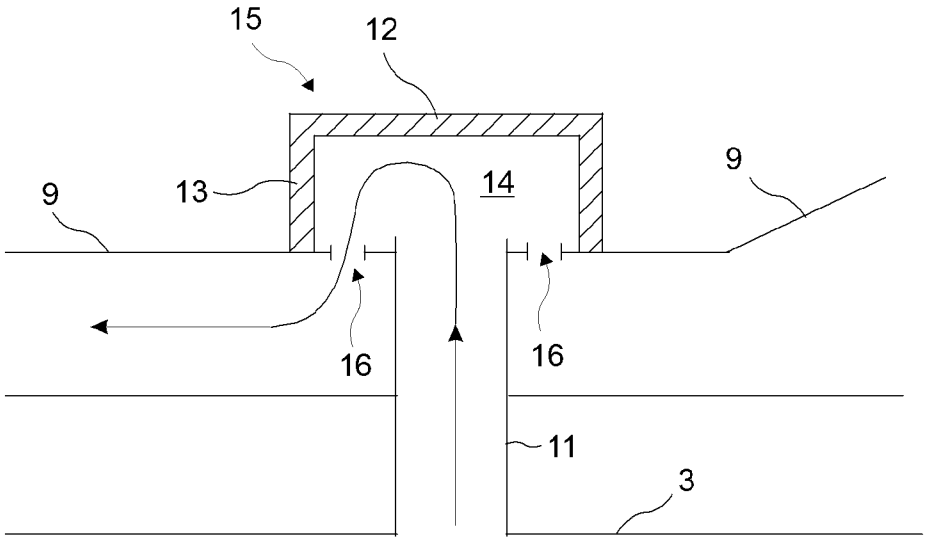


Figure 5

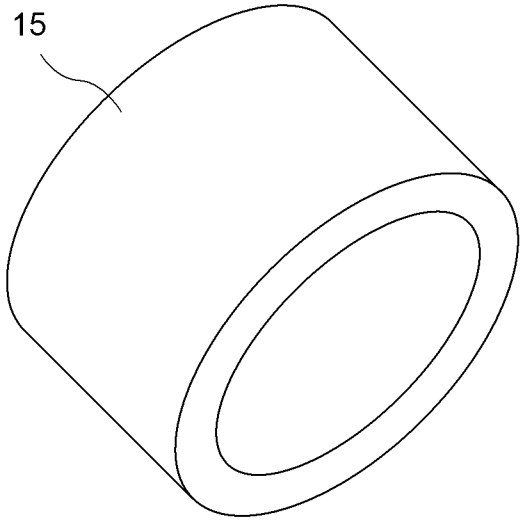


Figure 6

