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(54) OVEN FOR COOKING FOODSTUFF

OFEN ZUM KOCHEN VON LEBENSMITTELN

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Description

[0001] The present invention relates to an oven for cooking foodstuff, and more in particular to a "professional" oven, i.e. and oven used mainly in professional activities, like restaurants, canteens, hotels, etc.

[0002] Typically, professional ovens for foodstuffs comprise a housing, typically made of steel, containing a cooking chamber wherein foodstuffs can be placed for being cooked.

[0003] The cooking chamber is frequently provided with removable trays or racks, where food and/or pots or backing trays containing foodstuff can be placed.

[0004] The cooking chamber is typically parallelepipedal, and it is provided with a bottom wall wherein the grease dripping from foodstuff during the cooking is collected, and periodically drained via a cooking chamber outlet fluidly connected, typically via a valve, to a grease container external to the oven.

[0005] The oven is also provided with a heating device, e.g. an electric heater, or a gas heater, configured for heating the internal of the cooking chamber.

[0006] Typically, professional ovens are also provided with a ventilation system for circulating air within the cooking chamber during the cooking process, so as to make uniform the temperature within the internal of the cooking chamber.

[0007] Professional ovens are also typically provided with a vapour outlet duct, configured for discharging vapour from the cooking chamber during the cooking process; discharging the vapour is essential for keeping the pressure, the humidity, and the temperature within the cooking chamber within prefixed ranges specific for the kind of food to be cooked.

[0008] It is underlined that in the present application the word "vapour" has to be understood indiscriminately as pure steam, or as a mixture of steam and air and/or gasses.

[0009] The vapour outlet duct is fluidly connected to the internal of the cooking chamber via the same cooking chamber outlet used for draining the grease.

[0010] The vapour outlet duct is also typically provided with a quenching system for dehumidifying and cooling down the vapour before discharging it into the external environment; typically, the quenching system comprises a nozzle provided within the vapour outlet duct and positioned in such a way to spray a jet of fresh water against the vapour passing trough the vapour outlet duct, so as to cool down the vapour and to condensate the humidity contained therein.

[0011] Condensate is drained from the vapour outlet duct via a condensate draining conduit fluidly connected to an oven outlet configured for draining liquid outside the cooking oven.

[0012] A problem that affects these professional ovens is that during the cooking process, in particular in case of particularly fat foodstuffs, like for example roasted chicken, the grease dripping from the foodstuff and collected on the bottom wall of the cooking chamber can obstruct the cooking chamber outlet; in this case, the vapour can't reach the vapour outlet duct, and therefore it stays in the internal of the cooking chamber, modifying in an uncontrolled way the internal pressure, humidity and temperature, which can negatively affect the cooking process.

[0013] EP 0 388 751 A1 discloses a forced convection cooking oven with an upper conduit for achieving a discharge of damp air contained in the cooking rom of the oven.

[0014] WO 2015/164239 A1 discloses an oven with steam water separation, providing a flow arrangement for excess water which has not been converted to steam.

[0015] US 6 213 002 B1 discloses a cooking apparatus with a system for removal of grease from a grease/water mixture which has been drained from the cooking apparatus.

[0016] WO 2018/044171 A2 discloses a system comprising a self-cleaning oven, including an outlet for discharging the cleaning fluid.

[0017] In addition, even if the cooking chamber outlet is not obstructed, grease dripping from the foodstuff and collected into the bottom of the cooking chamber can enter the vapour outlet duct and, from the latter, can reach the condensate drain conduit, with the risk of obstructing the latter; if the condensate drain conduit is clogged, condensate level can increase so much that condensate enters the cooking chamber, with the risk of negatively affecting the cooking process, and/or of damaging the foodstuff or also the cooking chamber.

[0018] The aim of the invention is therefore to provide a cooking oven for foodstuff, in particular of the professional type, in which the temperature, humidity and pressure within the cooking chamber during the cooking process can be easily kept within prefixed ranges, also in case of high quantities of grease dripping from the foodstuff being cooked to the bottom of the cooking chamber.

[0019] Within this aim, another object of the invention is ensuring that the foodstuff is cooked in an optimal way, even in case of high quantities of grease dripping from the foodstuff being cooked to the bottom of the cooking chamber.

[0020] Applicant has found that by providing the bottom wall of the cooking chamber of a cooking oven for cooking foodstuffs with two distinct outlets, one positioned in such a way to collect grease dripping from the foodstuff being cooked, and fluidly connected to a grease conduit configured for draining grease from the cooking chamber, and the other fluidly connected to a vapour outlet duct configured for discharging vapour from the cooking chamber, the risk that grease dripping from the foodstuff during the cooking process and collected into the bottom wall of the cooking chamber can obstruct or clog the vapour outlet duct, and the related above mentioned problems, is highly reduced.

[0021] In fact, the grease collected in the bottom wall of the cooking chamber is split up in the two cooking

chamber outlets, reducing the amount of grease possibly entering any single cooking chamber outlet, and therefore the probability of clogging. In particular, above aim and objects are solved by a cooking oven for foodstuffs according to claim 1, said cooking oven comprising:

- a cooking chamber, wherein foodstuffs can be placed for being cooked, having a bottom wall provided with a first cooking chamber outlet positioned in such a way to receive grease collected in the bottom wall;
- a grease conduit configured for draining grease from the cooking chamber;

wherein the first cooking chamber outlet is fluidly connected to the grease conduit,
wherein the cooking oven further comprises:

- a heating device configured for heating the internal of the cooking chamber,
- a vapour outlet duct configured for discharging vapour from the cooking chamber,

wherein the bottom wall of the cooking chamber is provided with a second cooking chamber outlet, distinct from the first cooking chamber outlet and fluidly connected to the vapour outlet duct.

[0022] It is underlined that, since both the cooking chamber outlet are positioned in the bottom of the cooking chamber, their impact on the thermal uniformity within the cooking chamber, and in particular in the region where foodstuff is placed, is very small.

[0023] Preferably, the first cooking chamber outlet, i.e. the one connected to the grease conduit, and the second cooking chamber outlet, i.e. the one connected to the vapour outlet duct, are reciprocally positioned and/or arranged, in such a way that the grease collected in the bottom wall of the cooking chamber enters firstly/more easily the first cooking chamber outlet than the second cooking chamber outlet, so that the possibilities that the grease enters the second cooking chamber outlet are highly reduced.

[0024] According to the invention, the inlet border of the second cooking chamber outlet is placed at a raised position with respect to the inlet border of the first cooking chamber outlet; this positioning of the inlet border of the second cooking chamber outlet guarantees that if the grease collects in the bottom wall of the cooking chamber, it enters firstly the first cooking chamber outlet, and it is therefore drained to the grease conduit before reaching the level of the inlet border of the second cooking chamber outlet. In a further advantageous example, the bottom wall of the cooking chamber can be at least partially funnel-shaped, at least at or in proximity to the inlet border of the first cooking chamber outlet, so as to favour the drain of the grease collected in such a region to the first cooking chamber outlet.

[0025] Unclaimed other possible solutions can be used for forcing the grease collected in the bottom wall of the cooking chamber to enter firstly/more easily the first cooking chamber outlet than the second cooking chamber outlet; for example obstacles (e.g. protrusions) can be provided in the bottom wall of the cooking chamber, positioned in such a way to hinder the flow of the grease towards the second cooking chamber outlet and/or to and or to divert the flow towards the first cooking chamber outlet.

[0026] In a preferred embodiment, the bottom wall of the cooking chamber has a region, preferably centrally positioned, which is basin-shaped.

[0027] More preferably, the first cooking chamber outlet is positioned centrally with respect to this basin-shaped region.

[0028] Preferably, if the trays or racks are provided, the first cooking chamber outlet is positioned centrally with respect to overlying trays or racks, so as to effectively receiving grease dripping from the foodstuff positioned on these trays or racks.

[0029] In a preferred embodiment, the cooking oven comprises a shield element arranged for preventing grease, in particular grease falling from the overlying foodstuff being cooked, from entering the second cooking chamber outlet.

[0030] More preferably, the shield element is positioned over the second cooking chamber outlet, spaced apart from the inlet border of the latter.

[0031] Even more preferably, the shield element protrudes from a lateral wall of the cooking chamber.

[0032] Preferably, the shield element can be fixed to the lateral wall of the cooking chamber for example by welding and or screwing, and or bolts, etc.

[0033] In an advantageous embodiment, the shield element can have a convex shape, preferably a reversed V-shaped cross section, so as to deflect away from the underlying second cooking chamber outlet the grease droplets falling from the foodstuff being cooked.

[0034] Advantageously, the vapour outlet duct comprises a vapour outlet valve, for selectively opening/closing the vapour outlet duct, so as to regulate the discharge of the vapour in the external environment.

[0035] Advantageously, the cooking oven comprises an oven outlet, configured for draining liquid outside the cooking oven.

[0036] Preferably, the oven outlet is provided with an air trap.

[0037] In an advantageous embodiment, the grease conduit is selectively connected or connectable to a grease container.

[0038] Preferably, the grease conduit is selectively connected or connectable to the grease container via a first valve.

[0039] Preferably, the grease conduit is configured for draining grease exiting the first cooking chamber outlet by gravity.

[0040] It is underlined, that in the present application

"by gravity" means due only to the gravity force, so without the need of a dedicated fluid moving device, like for example a pump.

[0041] For example, stating that *"the grease conduit is configured for draining grease exiting the first cooking chamber outlet by gravity"* means that grease exiting the cooking chamber outlet is taken from the inlet to the outlet of the grease conduit due only to the effect of the gravity force, for example since the inlet is positioned higher than the outlet.

[0042] In a preferred embodiment, the grease conduit is oriented vertically, or substantially vertically, when the cooking oven is in its operative position.

[0043] It is underlined that in the present application *"operative position",* is defined as a position in which the oven is installed to be operated, and it lies in a horizontal, or substantial horizontal, plane such as the floor of a room, or the internal bottom wall of a piece of furniture in which the oven is built-in.

[0044] In an advantageous embodiment, the cooking oven comprises a vortex preventing device positioned at the first cooking chamber outlet and/or in the grease conduit, and configured for hindering the formation of vortexes in a stream of liquid exiting the cooking chamber via the first cooking chamber outlet.

[0045] The vortex preventing device hinders the formation of vortexes in the liquid flow exiting the cooking chamber through the first cooking chamber outlet.

[0046] Preferably, a vortex preventing device can be provided also at the second cooking chamber outlet.

[0047] Advantageously, the vortex preventing device is an insert having preferably a cross-shaped, or star-shaped cross section, in which a plurality of wings are advantageously defined.

[0048] Advantageously, these wings partialize the opening of the first cooking chamber outlet, hindering the formation of vortexes in the liquid flow exiting the cooking chamber through the first cooking chamber outlet.

[0049] Advantageously, the vortex preventing device is form-fitted within the first cooking chamber outlet.

[0050] In a preferred embodiment, the cooking oven comprises a cleaning system, for cleaning the internal of the oven.

[0051] Advantageously, the cleaning system comprises a circulation system configured for pumping liquid out of the cooking chamber and for pumping such liquid, or a part thereof, again in the cooking chamber.

[0052] In a preferred embodiment, the first cooking chamber outlet is fluidly connected, in addition to the grease conduit, to the oven outlet.

[0053] In a further preferred embodiment, the first cooking chamber outlet is fluidly connected, in addition to the grease conduit, to the circulation system.

[0054] In a further preferred embodiment, the second cooking chamber outlet is fluidly connected, in addition to the vapour outlet duct, to the oven outlet.

[0055] In a further preferred embodiment, the second cooking chamber outlet is fluidly connected, in addition to the vapour outlet duct, to the grease conduit.

[0056] In a further preferred embodiment, the second cooking chamber outlet is fluidly connected to the grease conduit via a connection duct whose end portion protrudes within the grease conduit, substantially perpendicularly to the internal surface of the latter.

[0057] This advantageous positioning of the end portion hinders the entrance of grease flowing within the grease conduit by gravity into the end portion; in fact, such a grease flowing in the grease conduit, abuts perpendicularly the external lateral wall of the end portion of the connection duct, and it is very difficult that it can enter the end portion, which requires a longitudinal entrance.

[0058] In a preferred embodiment, the second cooking chamber outlet is fluidly connected, in addition to the vapour outlet duct, to the circulation system.

[0059] Preferably, the first cooking chamber outlet and the second cooking chamber outlet are selectively connected to the oven outlet via a second valve.

[0060] Preferably, the circulation system comprises a circulation pump, an aspiration conduit connecting the circulation pump to the first cooking chamber outlet and/or to the second cooking chamber outlet, and a delivery conduit connecting the circulation pump to a washing/rinsing liquid circulation outlet provided in the cooking chamber and configured for allowing washing/rinsing liquid to enter said cooking chamber.

[0061] It is underlined that a washing liquid can be for example water and/or water containing a detergent, while a rinsing liquid can be, for example water and/or water containing a descaling additive, or a brightener.

[0062] In an advantageous embodiment, the cleaning system comprises a washing/rinsing liquid introduction system configured for taking washing/rinsing liquid within the cooking chamber.

[0063] More preferably, the washing/rinsing liquid introduction system comprises an introduction conduit fluidly connected to the cooking chamber and configured for selectively supplying into the latter washing and/or rinsing liquid.

[0064] In a further preferred embodiment, the washing/rinsing liquid introduction system comprises a third valve for controlling the supply of washing and/or rinsing liquid through the introduction conduit.

[0065] In an advantageous embodiment, the washing/rinsing liquid circulation outlet and/or the outlet of the introduction conduit are positioned in an upper wall of the cooking chamber. In an advantageous embodiment, the outlet of the introduction conduit is separated from the washing/rinsing liquid circulation outlet.

[0066] In a further advantageous embodiment, the outlet of the introduction conduit into the cooking chamber coincides with the washing/rinsing liquid circulation outlet.

[0067] In a further advantageous embodiment, the aspiration conduit is fluidly connected to the second cooking chamber outlet via a by-pass conduit fluidly connecting

the aspiration conduit to the vapour outlet duct, to which the second cooking chamber outlet is fluidly connected.

[0068] In a further advantageous embodiment, the by-pass conduit is fluidly connected to the grease conduit.

[0069] Preferably, the by-pass conduit is fluidly connected to the grease conduit via the above-mentioned connection duct.

[0070] Preferably, the cooking oven comprises a drain conduit fluidly connecting the oven outlet to the first cooking chamber outlet and to the second cooking chamber outlet.

[0071] More preferably, the drain conduit is fluidly connected to the oven outlet via the second valve.

[0072] Still more preferably, the aspiration conduit is selectively fluidly connected to the oven outlet via the drain conduit.

[0073] Preferably, the by-pass conduit is selectively fluidly connected to the oven outlet via the drain conduit.

[0074] Preferably, the grease conduit is selectively fluidly connected to the oven outlet via the drain conduit.

[0075] In an advantageous embodiment, the cooking oven comprises a quenching system for cooling down steam exiting from the cooking chamber.

[0076] Preferably, the quenching system comprises a quenching conduit for supplying cooling liquid within the vapour outlet duct.

[0077] In a preferred embodiment, the quenching conduit comprises an inlet positioned, in the operative position of the cooking oven, at a higher level with respect to the maximum level that washing/rinsing liquid can reach within the cooking chamber during the washing procedure of the cooking oven; this ensures that, even if washing/rinsing liquid should flow back through the quenching conduit, it wouldn't exit the latter with the risk of contaminating the water mains.

[0078] In a preferred embodiment, the vapour outlet duct comprises:

- a bottom region, positioned, in the operative position of the cooking oven, at least partially below the cooking chamber, and fluidly connected downstream of the second cooking chamber outlet,
- an end region protruding upwards from the bottom region, from which vapour is released in the environment.

[0079] Preferably, the quenching conduit comprises an outlet positioned within the bottom region of the vapour outlet duct; in this way quenching liquid is released in the vapour outlet duct quite far away from its end region. This arrangement of the outlet prevents that quenching liquid (e.g. water) exiting the quenching conduit is taken out of the vapour outlet duct due to the flow of vapour flowing therein.

[0080] Preferably, the bottom region of the vapour outlet duct is slightly inclined in such a way that liquid contained therein tends to flow, by gravity, in counter-current with respect to the vapour.

[0081] In a preferred embodiment, the by-pass conduit is connected to the vapour outlet duct at or in proximity to the initial region of the bottom region so that, due to the slope of the latter, condensed liquid present in such a bottom region flows by gravity into the by-pass conduit. In an advantageous embodiment, the outlet of the quenching conduit comprises a quenching nozzle arranged within the bottom region and configured for spraying a jet of water against the vapour exiting the second cooking chamber outlet.

[0082] Advantageously, the cooking oven comprises a fourth valve for controlling the supply of cooling water through the quenching conduit.

[0083] Advantageously, the cooking oven comprises a perforated suction wall separating the cooking chamber from a heating chamber containing at least partially the heating device and a fan, wherein the fan is configured for circulating heated air through the cooking chamber and the heating chamber.

[0084] In an advantageous embodiment, the cooking oven comprises a ventilation pipe fluidly connected to the cooking chamber and configured for selectively taking air from the external environment into the cooking chamber.

[0085] Preferably, the ventilation pipe comprises an outlet provided at the heating chamber. More preferably, the ventilation pipe is provided with a ventilation valve for selectively closing the ventilation pipe.

[0086] In an advantageous embodiment, the cooking oven comprises an overflow conduit directly fluidly connecting the vapour outlet duct to the oven outlet, and configured for directly discharging to the oven outlet the liquid present in the vapour outlet duct only if the level of the liquid in the vapour outlet duct exceeds a certain height.

[0087] In an advantageous embodiment, the circulation system is fluidly connected to the vapour outlet duct, and it is configured for taking washing/rinsing liquid from said cooking chamber into the vapour outlet duct, so as to wash the latter.

[0088] In a preferred embodiment, the cleaning system comprises a washing/rinsing additive supplying system configured for supplying washing and/or rinsing additives to the internal of the cooking chamber.

[0089] It is underlined that a washing additive can be, for example, a detergent, while a rinsing additive can be for example a descaling additive, a brightener, etc.

[0090] Preferably, the washing/rinsing additive supplying system comprises an additive drawer, loadable with a washing/rinsing additive and selectively fluidly connected or connectable to the circulation system in such a way to selectively supply a washing and/or rinsing additive to the latter.

[0091] More preferably, the additive drawer, is selectively fluidly connected or connectable to the aspiration conduit and/or delivery conduit.

[0092] Still more preferably, the cooking oven comprises a fifth valve for connecting the additive drawer to water

supply mains.

[0093] In a further advantageous embodiment, the cooking oven comprises a sixth valve selectively connecting the additive drawer to the aspiration conduit and/or delivery conduit.

[0094] In a further advantageous embodiment, the cleaning system comprises a washing/rinsing additive multi-dosing system configured for supplying to the internal of the cooking chamber metered amounts of washing and/or rinsing additives.

[0095] Preferably, the washing/rinsing additive multi-dosing system comprises:

- one or more washing/rinsing additives containers filled or fillable with an amount of washing and/or rinsing additives sufficient for a plurality of washing/rinsing cycles;
- one or more washing/rinsing additives delivery conduits fluidly connecting such one or more washing/rinsing additives containers to the internal of the cooking chamber;
- one or more washing/rinsing additives pumps, configured for pumping a washing/rinsing additive out of the one or more washing/rinsing additives containers and delivery the washing/rinsing additives to the cooking chamber via one or more washing/rinsing additives delivery conduits.

[0096] In an advantageous embodiment, at least one of the one or more washing/rinsing additives containers is fluidly connected to the additive drawer.

[0097] In a further preferred embodiment, at least one of the one or more washing/rinsing additives containers is fluidly connected to the washing/rinsing liquid introduction system.

[0098] More preferably all the one or more washing/rinsing additives containers are fluidly connected to the introduction conduit.

[0099] Advantageously, the cooking oven comprises a steam supply system configured for producing and supplying steam into the cooking chamber.

[0100] Preferably, the steam supply system comprises a boiler configured for producing steam and fluidly connected to the cooking chamber so as to release into the latter the steam.

[0101] More preferably, the boiler comprises a water reservoir fillable with water, and a water heater for heating water loaded within the water reservoir.

[0102] In an advantageous embodiment, the steam supply system comprises:

- a water inlet conduit fluidly connected to the water reservoir and connected or connectable to water mains,
- a water outlet conduit fluidly connecting the water reservoir to the oven outlet.

[0103] Still preferably, the steam supply system comprises:

- a sixth valve associated to the water inlet conduit for controlling the delivery of water to the water reservoir,
- a eighth valve associated to the water outlet conduit for controlling the drain of liquid from the reservoir to the oven outlet.

[0104] Preferably, the steam supply system comprises a steam duct fluidly connecting the reservoir to the cooking chamber.

[0105] In an advantageous embodiment, the cleaning system is configured for supplying a washing/rinsing liquid to the steam supply system.

[0106] Preferably, the cleaning system is configured for supplying a washing/rinsing liquid to the boiler.

[0107] Preferably, the cleaning system comprises a boiler cleaning conduit, fluidly connecting the washing/rinsing additive supplying system to the boiler.

[0108] More preferably, the boiler cleaning conduit fluidly connects the water reservoir to the additive drawer.

[0109] Still preferably, the boiler cleaning conduit fluidly connects the water reservoir to the washing/rinsing additive multi-dosing system.

[0110] More preferably, the boiler cleaning conduit fluidly connects the water reservoir to one or more of said the or more washing/rinsing additives container.

[0111] Preferably, the cooking oven comprises an electronic controller, for example a programmed/programmable electronic board, for controlling one or more (preferably all the) functions of the cooking oven (e.g. the cooking procedure, the washing procedure, the electronic controllable components, etc.).

[0112] These and other features and advantages of the invention will be better apparent from the following description of some exemplary and non-limitative embodiments, to be read with reference to the attached drawings, wherein:

- Fig. 1 is a schematic frontal view of an oven according to the invention;
- Fig. 2 is a schematic lateral view of a first embodiment of an oven according to the invention, with some parts removed for more clarity;
- Fig. 3 is a schematic lateral view of a second embodiment of an oven according to the invention, with some parts removed for more clarity;
- Fig. 4 is a schematic lateral view of a third embodiment of an oven according to the invention, with some parts removed for more clarity;
- Fig. 5 is a schematic lateral view of a fourth embodiment of an oven according to the invention, with some parts removed for more clarity;
- Fig. 6 is a schematic lateral view of a fifth embodiment of an oven according to the invention, with some parts removed for more clarity;
- Fig. 7 is a detail of the first cooking chamber outlet

according to an advantageous embodiment of the invention, in which a vortex preventing device is visible;

- Fig. 8 is a detail of a schematic lateral view the bottom region of the cooking chamber according to a further advantageous embodiment of the invention.

[0113] With reference initially to Fig. 1, a cooking oven 1 according to the invention is schematically described.

[0114] It is underlined that all the functions of the oven can be advantageously controlled by a suitable electronic controller, for example a programmed/programmable electronic board, schematically illustrated in figure 1 by a dashed square 600.

[0115] The cooking oven comprises an external casing 200, containing a cooking chamber 2, wherein foodstuffs can be placed for being cooked; preferably, the cooking chamber is accessible via a door 2a.

[0116] In an advantageous embodiment, like in the examples of attached figures, the cooking chamber 2 contains a plurality of trays or racks 2b, wherein foodstuff, or pots or trays containing foodstuff, can be placed for being cooked.

[0117] The cooking chamber 2 has a bottom wall 3, preferably, but not necessarily, at least partially, basin-shaped, so as to better collect grease dripping from the foodstuffs being cooked. Advantageously, the bottom wall 3 is provided with a first cooking chamber outlet 4 positioned in such a way to receive grease or liquid dripped from the foodstuff being cooked and collected in the bottom wall 3.

[0118] In the advantageous examples illustrated in attached figures, the bottom wall 3 has a region 3a, preferably centrally positioned, which is basin shaped; in this advantageous example, the first cooking chamber outlet 4 is positioned centrally with respect to this basin-shaped region 3a. More preferably, the region 3a is at least partially funnel-shaped, at least at or in proximity to the inlet border 4a of first cooking chamber outlet 4, so as to favour the drain of the grease collected on such a region 3a to the first cooking chamber outlet 4.

[0119] Preferably, if the trays or racks 2b are provided, the first cooking chamber outlet 4 is positioned centrally with respect to overlying trays or racks 2b, so as to effectively receive grease dripping from the foodstuff positioned on these trays or racks 2b.

[0120] The oven 1 also comprises a grease conduit 6 configured for draining grease from the cooking chamber 2; the first cooking chamber outlet 4 is fluidly connected to the grease conduit 6.

[0121] Advantageously, the grease conduit 6 is selectively connected or connectable to a grease container 60, positioned preferably outside the oven 1, and more preferably removable, in such a way that, when full, it can be removed for being emptied, and/or it can be replaced by an empty one.

[0122] In an advantageous embodiment, the grease conduit 6 is selectively connected or connectable to the grease container 60 via a first valve 11, that can be selectively opened and closed, automatically and/or manually, in order to allow grease dripping from the foodstuff to be collected in the grease container 60.

[0123] In a preferred embodiment, the grease conduit 6 is configured for draining grease exiting the first cooking chamber outlet 4 by gravity.

[0124] This can be obtained, for example, by orienting the grease conduit 6 vertically, or substantially vertically, when the cooking oven 1 is in its operative position.

[0125] Advantageously, the cooking oven further comprises a heating device 8 configured for heating the internal of the cooking chamber 2; the heating device 8 can be an electrical heater, or (as in the examples illustrated in attached figures) hot tubes wherein the hot fumes exiting a gas burner flows, a heat exchanger, etc.

[0126] Advantageously, the cooking oven 1 comprises a perforated suction wall 18 separating the cooking chamber 2 from a heating chamber 19 containing, at least partially, the heating device 8, and, preferably, a fan 20 configured for circulating heated air through the cooking chamber 2 and the heating chamber 19.

[0127] The cooking oven 1 comprises a vapour outlet duct 9 configured for discharging vapour from the cooking chamber 2; the vapour outlet duct 9 can advantageously discharge the vapour in the external environment around the cooking oven 1, or it can be advantageously connected to a vapour discharge system, preferably provided in the building where the cooking oven 1 is installed.

[0128] Advantageously, the vapour outlet duct 9 comprises a vapour outlet valve 45, for selectively opening/closing the vapour outlet duct 9, so as to regulate the discharge of the vapour in the external environment.

[0129] According to the invention, the bottom wall 3 of the cooking chamber 2 is provided with a second cooking chamber outlet 10, distinct from the first cooking chamber outlet 4 and fluidly connected to the vapour outlet duct 9.

[0130] Vapour (e.g. a mixture of steam and air/gas) present the cooking chamber 2, for example emitted from the foodstuff, and/or (like in the advantageously embodiments of figures 3 and 4) due to steam supplied in the cooking chamber 2 by a steam supply system 35, if the cooking oven is advantageously provided with such a steam supply system 35, is therefore discharged outside the cooking oven 1 passing through the second cooking chamber outlet 10 and the vapour outlet duct 9.

[0131] Preferably, the first cooking chamber outlet 4 and the second cooking chamber outlet 10 are positioned on the bottom wall 3, and are reciprocally positioned and/or arranged, in such a way that the grease collected in the bottom wall 3 enters firstly/more easily the first cooking chamber outlet 4 than the second cooking outlet chamber 10, so that the possibilities that the grease enters the second cooking chamber outlet 10 are highly reduced.

[0132] According to the invention, the inlet border 10a of the second cooking chamber outlet 10 is placed at a raised position with respect to the inlet border 4a of the

first cooking chamber outlet 4; in this way the grease collected in the bottom 3 goes firstly into the first cooking chamber outlet 4, and therefore the possibilities that its level increases enough to enter the first cooking chamber outlet 10 are highly reduced.

[0133] In a further advantageous embodiment, like in the example of Figure 8, the cooking oven 1 can comprise a shield element 300 for preventing grease in particular grease falling from the overlying foodstuff being cooked, from entering the second cooking chamber outlet 10. Preferably, the shield element 300 is positioned over the second cooking chamber outlet 10, spaced apart from the inlet border 10a of the latter.

[0134] More preferably, the said shield element 300 protrudes from the lateral wall of the cooking chamber 2; advantageously the shield element 300 can be fixed to the lateral wall of the cooking chamber for example by welding and or screwing, and or bolts, etc.

[0135] In an advantageous embodiment, the shield element 300 can have a convex, preferably reversed V-shaped, cross section, so as to deflect away from the underlying second cooking chamber outlet 10 the grease droplets falling from the foodstuff being cooked.

[0136] In the advantageous embodiments illustrated in attached figures, the cooking oven 1 comprises a cleaning system 70, advantageously comprising a circulation system 7 configured for pumping liquid out of the cooking chamber 2 and for pumping such liquid, or a part thereof, again in the cooking chamber 2.

[0137] In preferred embodiments, like for example the ones illustrated in attached figures, the circulation system 7 comprises a circulation pump 7a, an aspiration conduit 7b connecting the circulation pump 7a to the first cooking chamber outlet 4 and/or to the second cooking chamber outlet 10, and a delivery conduit 7c connecting the circulation pump 7a to a washing/rinsing liquid circulation outlet 13 provided in the cooking chamber 2 and configured for allowing washing/rinsing liquid to enter the cooking chamber 2.

[0138] It is underlined that a washing liquid can be for example water and/or water containing a detergent, while a rinsing liquid can be, for example water and/or water containing a descaling additive or a brightener.

[0139] In an advantageous embodiment, like in the examples illustrated in attached figures, the aspiration conduit 7b fluidly connects the circulation pump 7a both to the first cooking chamber outlet 4 and to the second cooking chamber outlet 10.

[0140] In an advantageous embodiment, like in the examples illustrated in attached figures, the cooking oven 1 comprises a vortex preventing device 100 positioned at the first cooking chamber outlet 4 and/or in the grease conduit 6, and configured for hindering the formation of vortexes in a stream of liquid exiting the cooking chamber 2 via the first cooking chamber outlet 4.

[0141] Advantageously, the vortex preventing device 100 can be an insert having preferably a cross-shaped, or star-shaped cross section, in which a plurality of wings 100a are advantageously defined, preferably form fitted within the first cooking chamber outlet 4; wings 100a partialize the opening of the first cooking chamber outlet 4, hindering the formation of vortexes in the liquid flow exiting the cooking chamber 2 through the first cooking chamber outlet 4.

[0142] Absence of vortexes is very important in the advantageous embodiments in which the oven is provided with above described circulation system 7, since vortexes could form bubbles that prevent the circulation pump 7a to prime properly.

[0143] In a further embodiment, not illustrated, a vortex preventing device 100 is positioned also at the second cooking chamber outlet 10.

[0144] Advantageously, the cooking oven 1 comprises an oven outlet 5, configured for draining liquid outside the cooking oven 1; advantageously the oven outlet 5 can be connected to the sewage pipes, not illustrated, of the building in which the cooking oven 1 is installed. Preferably, the first cooking chamber outlet 4 is fluidly connected, in addition to the grease conduit 6, also, preferably selectively, to the oven outlet 5.

[0145] Advantageously, the oven outlet 5 is provided with an air trap 5a, for preventing, when active (i.e. when filled with a liquid), gas to exit through said oven outlet 5.

[0146] In the advantageous embodiment in which the cooking oven 1 is provided with the circulation system 7, as in the examples of attached figures, the first cooking chamber outlet 4 can be fluidly connected to the circulation system 7.

[0147] In an advantageous embodiment, as in the examples of attached figures, the second cooking chamber outlet 10 is fluidly connected, in addition to the vapour outlet duct 9, to the oven outlet 5.

[0148] Preferably, the first cooking chamber outlet 4 and the second cooking chamber outlet 10 are selectively connected to the oven outlet 5 via a second valve 12, which can be manual or automatic.

[0149] Advantageously, the cooking oven 1 comprises a drain conduit 5b fluidly connecting the oven outlet 5 to the first cooking chamber outlet 4 and, preferably, to the second cooking chamber outlet 10.

[0150] Advantageously, the drain conduit 5b is fluidly connected to the oven outlet 5 via the second valve 12.

[0151] In a preferred embodiment, the second cooking chamber outlet 10 is fluidly connected, in addition to the vapour outlet duct 9, to the grease conduit 6.

[0152] In a preferred embodiment, the second cooking chamber outlet 10 is fluidly connected to the grease conduit 6 via a connection duct 50 whose end portion 50a protrudes within the grease conduit 6, substantially perpendicularly to the internal surface of the latter.

[0153] This positioning of the end portion 50a hinders the entrance of grease flowing within the grease conduit 6 by gravity into the end portion 50a; in fact, such a grease, flowing in the grease conduit 6, abuts perpendicularly against the external lateral wall of the end portion 50a of the connection duct 50, and it is very difficult

that it can enter the end portion 50a which requires a longitudinal entrance.

[0154] Preferably, the aspiration conduit 7b of the circulation system 7 is fluidly connected to the second cooking chamber outlet 10 via a by-pass conduit 14 fluidly connecting the aspiration conduit 7b to the vapour outlet duct 9, to which the second cooking chamber outlet 10 is fluidly connected.

[0155] More preferably, the by-pass conduit 14 is fluidly connected to the grease conduit 6.

[0156] Even more preferably, the by-pass conduit 14 is fluidly connected to the grease conduit 6 via above described connection duct 50.

[0157] Advantageously, the aspiration conduit 7b of the circulation system 7 is selectively fluidly connected to the oven outlet 5 via the drain conduit 5b.

[0158] Advantageously, the by-pass conduit 14 is selectively fluidly connected to the oven outlet 5 via the drain conduit 5b.

[0159] Advantageously, the grease conduit 6 is selectively fluidly connected to the oven outlet 5 via the drain conduit 5b.

[0160] In an advantageous embodiment, the cleaning system 70 comprises a washing/rinsing liquid introduction system 16 configured for taking washing/rinsing liquid within the cooking chamber 2.

[0161] In an advantageous embodiment, the washing/rinsing liquid introduction system 16 comprises an introduction conduit 16a fluidly connected to the cooking chamber 2 and configured for selectively supplying into the latter washing and/or rinsing liquid.

[0162] In a preferred embodiment, the washing/rinsing liquid introduction system 16 comprises a third valve 16b for controlling the supply of washing and/or rinsing liquid through the introduction conduit 16a.

[0163] Advantageously, as in the examples illustrated in attached figures, the introduction conduit 16a can be connected, upstream the third valve, to water mains, not illustrated, provided in the building where the cooking oven 1 is installed.

[0164] Advantageously, the washing/rinsing liquid circulation outlet 13 and the outlet 16c of the introduction conduit 16a are positioned in an upper wall 23 of the cooking chamber 2.

[0165] Preferably, the washing/rinsing liquid circulation outlet 13 and the outlet 16c of the introduction conduit 16a are positioned in an upper wall 23 of the cooking chamber 2, in proximity of the suction wall 18.

[0166] Preferably, the outlet 16c of the introduction conduit 16a is separated from the washing/rinsing liquid circulation outlet 3.

[0167] In a further advantageous embodiment, not illustrated, the outlet of the introduction conduit 16a into the cooking chamber 2 coincides with the washing/rinsing liquid circulation outlet 13.

[0168] Advantageously, the cooking oven 1 comprises a quenching system 17 for cooling down steam exiting from the cooking chamber 2.

[0169] Preferably, the quenching system 17 comprises a quenching conduit 17a for supplying a cooling liquid within the vapour outlet duct 9.

[0170] The quenching liquid is preferably fresh water, coming from the water mains, not illustrated, of the building in which the cooking oven 1 is installed, to which the quenching conduit 17a can be fluidly connected.

[0171] Advantageously, the quenching conduit 17a comprises an inlet 170a positioned, in the operative position of the cooking oven 1, at a higher level with respect to the maximum level 500 that washing/rinsing liquid can reach within the cooking chamber 2 during the washing procedure of the cooking oven 1.

[0172] This ensures that, even if washing/rinsing liquid should flow back through the quenching conduit 17a, it wouldn't exit the latter with the risk of contaminating the water mains.

[0173] In a preferred embodiment, as in the examples illustrated in attached figures, the vapour outlet duct 9 comprises a bottom region 9a, positioned, in the operative position of the cooking oven 1, at least partially below the cooking chamber 2, and fluidly connected downstream of said second cooking chamber outlet 10.

[0174] More preferably, as in the examples of the attached figures, the bottom region 9a of the vapour outlet duct 9 is slightly inclined in such a way that liquid contained therein tends to flow, by gravity, in counter-current with respect to the vapour flowing through the bottom region 9a; in other words, the bottom region 9a is preferably inclined in such a way to define a backwards slope.

[0175] In a preferred embodiment, the by-pass conduit 14 is connected to the vapour outlet duct 9 at or in proximity to the initial region of the bottom region 9a so that, due to the slope of the latter, condensed liquid present in such a bottom region 9a flows by gravity into the by-pass conduit 14.

[0176] Preferably, the vapour outlet duct 9 comprises an end region 9b protruding upwards from the bottom region 9a, from which vapour is released in the environment.

[0177] Advantageously, the end region 9b is substantially vertical.

[0178] Preferably, the quenching conduit 17a comprises an outlet 1710b positioned within the bottom region 9a of the vapour outlet duct 9; since in this way quenching liquid is released in the vapour outlet duct quite far away from its end region 9a, this arrangement of the outlet 170b prevents that quenching liquid (e.g. water) exiting the quenching conduit 17a is taken out of the vapour outlet duct 9 by the flow of vapour, schematically illustrated with dotted arrows 400 in attached figures, flowing therein.

[0179] Preferably, the outlet 170b of the quenching conduit 17a can comprise a quenching nozzle, not illustrated, arranged within the bottom region 9a and configured for spraying a jet of water against the vapour exiting the cooking chamber outlet 10.

[0180] In an advantageous embodiment, the quench-

ing system 17 comprises a fourth valve 17c for controlling the supply of cooling water through the quenching conduit 17a.

[0181] Preferably, as in the examples illustrated in attached figures, the cooking oven 1 comprises a ventilation pipe 21 fluidly connected to the cooking chamber 2 and configured for selectively taking air from the external environment into the cooking chamber 2.

[0182] Preferably, the ventilation pipe 21 comprises an air inlet 21a provided at the heating chamber 19, more preferably in proximity to the fan 20.

[0183] Advantageously, the ventilation pipe 21 is provided with a controlled ventilation valve 22 for selectively closing the ventilation pipe 21.

[0184] Preferably, the cooking oven 1 comprises an overflow conduit 26 directly fluidly connecting the vapour outlet duct 9 to the oven outlet 5, and configured for directly discharging to the oven outlet 5 liquid present in the vapour outlet duct 9 only if the level of such a liquid exceeds a certain height. Advantageously, such height corresponds to the maximum level 500 allowed for the liquid within the cooking chamber 2.

[0185] Advantageously, like in the examples of attached figures, the circulation system 7 is fluidly connected to the vapour outlet duct 9, and it is configured for taking washing/rinsing liquid from the cooking chamber 2 into the vapour outlet duct 9, so as to wash the latter.

[0186] Advantageously, the cleaning system 70 comprises a washing/rinsing additive supplying system 27 configured for supplying washing and/or rinsing additives to the internal of the cooking chamber 2.

[0187] In a preferred embodiment, the washing/rinsing additive supplying system 27 comprises an additive drawer 28, loadable with a washing/rinsing additive, and selectively fluidly connected or connectable to the circulation system 7, in such a way to selectively supply a washing and/or rinsing additive into the latter, and preferably to the aspiration conduit 7b and/or delivery conduit 7c.

[0188] Preferably, the washing/rinsing additive comprises a descaling additive.

[0189] Preferably, the cooking oven 1 comprises a fifth valve 29 for connecting the additive drawer 28 to water supply mains.

[0190] Preferably, the cooking oven 1 comprises a sixth valve 30 selectively connecting the additive drawer 28 to the aspiration conduit 7b and/or delivery conduit 7c.

[0191] In a further advantageous embodiment, like in the examples illustrated in figures 4 to 6, the cleaning system 70 comprises a washing/rinsing additive multi-dosing system 31 configured for supplying to the internal of the cooking chamber 2 metered amounts of washing and/or rinsing additives.

[0192] Preferably, the washing/rinsing additive multi-dosing system 31 comprises:

- one or more washing/rinsing additives containers 32a, 32b filled or fillable with an amount of washing and/or rinsing additives sufficient for a plurality of washing/rinsing cycles;
- one or more washing/rinsing additives delivery conduits 33a, 33b fluidly connecting such one or more washing/rinsing additives containers 32a, 32b to the internal of the cooking chamber 2;
- one or more washing/rinsing additives pumps 34a, 34b, configured for pumping a washing/rinsing additive out of the one or more washing/rinsing additives containers 32a, 32b and for delivering the washing/rinsing additives to the cooking chamber 2 via the one or more washing/rinsing additives delivery conduits 33a, 33b.

[0193] In advantageous embodiments, like the ones illustrated in the examples of figures 4 and 6, at least one of the one or more washing/rinsing additives containers 32a, 32bs (for example container 32a in figures 4 and 6) is fluidly connected to the additive drawer 28; in this way, the user can decide if using the cleaning system 70 as a *"single dose"* cleaning system, i.e. a system requiring to load the drawer 28 any time it has to be used (in this case the user uses the drawer 28 for loading the single dose of additive), or as a *"multi-dose"* system, i.e. a cleaning system in which the additive(s) have to be filled (or refilled), only sporadically, being enough for a plurality of washing/rinsing procedures.

[0194] Preferably, at least one of the one or more washing/rinsing additives containers 32a, 32b is fluidly connected to the washing/rinsing liquid introduction system 16, preferably to the introduction conduit 16a.

[0195] In an advantageous embodiment, like for example the one illustrated in figure 5, all the washing/rinsing additives containers 32a, 32b are fluidly connected to the introduction conduit 16a; in this case, the drawer 28 is preferably not provided, and the cleaning system 70 can be used only as a "multi-dose" system.

[0196] In advantageous embodiments, like for example the ones illustrated in figures 3 and 4, the cooking oven 1 comprises a steam supply system 35 configured for producing and supplying steam into the cooking chamber 2.

[0197] Advantageously the steam supply system 35 can comprise a boiler 36 configured for producing steam and fluidly connected to the cooking chamber 2 so as to release into the latter the steam.

[0198] Preferably, the boiler 36 comprises a water reservoir 37 fillable with water, and a water heater 38 for heating water loaded within the water reservoir 37.

[0199] Advantageously, the steam supply system 35 comprises:

- a water inlet conduit 39 fluidly connected to the water reservoir 37 and connected or connectable to water mains,
- a water outlet conduit 40 fluidly connecting the water reservoir 37 to the oven outlet 5. More preferably, the steam supply system 35 comprises:

- a seventh valve 41 associated to the water inlet conduit 39 for controlling the delivery of water to the water reservoir 37,
- a eight valve 42 associated to the water outlet conduit 40 for controlling the drain of liquid from the reservoir 37 to the oven outlet 5.

[0200] Preferably, the steam supply system 35 comprises a steam duct 43 fluidly connecting the reservoir 37 to the cooking chamber 2, for supplying the steam from the reservoir 37 into the latter.

[0201] In advantageous embodiments, like in the examples of figures 3 and 4, the cleaning system 70 is configured for supplying a washing/rinsing liquid to the boiler 36.

[0202] In advantageous embodiments, like the ones illustrated in figures 3 and 4, the cleaning system 70 comprises a boiler cleaning conduit 44, fluidly connecting the washing/rinsing additive supplying system 27 to the boiler 36.

[0203] Preferably, like in the example of figures 3 and 4, the boiler cleaning conduit 44 fluidly connects the water reservoir 37 to the additive drawer 28.

[0204] In an advantageous embodiment, like in the example of figure 4, the boiler cleaning conduit 44 fluidly connects the water reservoir 37 to the washing/rinsing additive multi-dosing system 31. In this case, the boiler cleaning conduit 44 can preferably fluidly connect the water reservoir 37 to one or more of the one or more washing/rinsing additives container 32a, 32b.

[0205] The functioning of the oven according to the invention will be explained in relation to the different embodiments illustrated in attached figures; it is underlined that figure 1 is a schematic illustration of the external shape of a possible embodiment of a cooking oven 1 according to the invention, which fits all the internal layouts illustrated in figures 2 to 6. With reference to the embodiment of figure 2, once the foodstuff has been loaded into the cooking chamber 2, and the door 2a closed, the cooking process can be started; the heating device 8 and the fan 20 are operated, advantageously by the electronic controller 600 of the cooking oven 1, according to a specific cooking program selected and/or programmed by a user.

[0206] Also ventilation valve 22 is controlled, advantageously by the electronic controller 600 of the cooking oven 1, for keeping fresh air from the external environment into the cooking chamber 2, advantageously according to the specific cooking program selected and/or programmed by the user.

[0207] During the cooking process, the vapour present in the cooking chamber 2, and the high internal temperature, increase the internal pressure, and, when the latter exceeds ambient pressure, vapour is expelled to external of the cooking chamber 2 via the second cooking chamber outlet 10 and the vapour outlet duct 9. Vapour outlet valve 45, if present, is controlled, preferably by the electronic controller 600, for selectively controlling the vapour discharge.

[0208] The quenching system 17, if provided, emits a jet of preferably fresh clean water, taken more preferably from external water mains, against the flow of vapour 400 flowing through the vapour outlet duct 9, cooling down and dehumidifying such a vapour; condensate resulting from this quenching process is collected in the bottom region 9a of the vapour outlet duct 9, and, preferably due to its slope, it is taken by gravity to the by-pass conduit 14, from which it is taken, still by gravity, to the drain conduit 5b, and to the oven outlet 5, from where it can be drained to the sewage pipes, not illustrated, of the building in which the cooking oven 1 is installed.

[0209] Advantageously, before reaching the oven outlet 5, the condensate reaches the air trap 5a (if provided), activating the latter (if not already activated by liquid present in the latter from previous usages of the cooking oven), so that vapour can't exit through it.

[0210] If condensate level within the vapour outlet duct 9 exceed the level of the overflow conduit 26, it is drained by the latter directly to the oven outlet 5 (passing through the air trap 5a, if present).

[0211] During the cooking process, grease can fall from the overlying foodstuff to the bottom 3 of the cooking chamber 2, and it is collected into the cooking chamber outlet 4 and taken to the grease conduit 6, from which it is collected into the grease container 60.

[0212] Having provided two separated cooking chamber outlets, one dedicated to collect grease, reduces the possibility that grease could obstruct the second cooking chamber outlet 10 taking to the vapour outlet duct 9.

[0213] In the advantageous embodiment in which the bottom wall 3 of the cooking chamber 2 has a region 3a at least partially funnel-shaped at least at or in proximity to the inlet border 4a of first cooking chamber outlet 4, grease collected on this region 3a is very effectively taken by gravity into the first cooking chamber outlet 4.

[0214] In the embodiment of the invention in which the inlet border 10a of the second cooking chamber outlet 10 is placed at a raised position with respect to the inlet border 4a of the first cooking chamber outlet 4, if the grease collects in the bottom wall 3 of the cooking chamber, it enters firstly the first cooking chamber 4, and it is therefore drained to the grease conduit 6 before reaching the level of the inlet border of the second cooking chamber outlet 10.

[0215] In the advantageous embodiment, illustrated for example in figure 8, in which the cooking oven 1 comprises a shield element 300 for preventing grease from entering the second cooking chamber outlet 10, such a shield element 300 prevents also grease drops falling from the foodstuff being cooked to directly enter the second cooking chamber outlet 10.

[0216] After the end of cooking process, the oven can be cleaned by the cleaning system 70; an automatic or semi-automatic cleaning process can be advantageously activated by the electronic controller 600, which operates on the electrically/electronically operated components of

the cleaning system 70.

[0217] The automatic or semi-automatic cleaning process advantageously starts with a washing phase, in which, in the embodiment of figure 2, after having emptied the cooking chamber 2 and having positioned a detergent, for example in form of a tablet or of powder, in the bottom 3 of the cooking chamber, the door 2a can be closed, and, with the second valve 12 and the first valve 11 closed, third valve 16b can be opened (preferably automatically by the electronic controller 600).

[0218] The liquid level within the cooking chamber 2 is preferably detected, for example by a suitable level sensor, not illustrated, present within the cooking chamber 2, and/or by a flowmeter, not illustrated measuring the amount of water entering through the third valve 16b, and communicating this amount to the electronic controller 600, which is configured for calculating the liquid level from the amount of liquid entering through the third valve 16b.

[0219] Once the liquid level within the cooking chamber 2 has reached a prefixed value, and/or after a certain time has lapsed, third valve 16b is closed (advantageously automatically by the electronic controller 600).

[0220] Then, the circulation pump 7a is operated, so as to circulate the washing liquid (i.e. water mixed with the detergent present in the cooking chamber 2) through the circulation system 7. In particular, the washing liquid is circulated through the first cooking chamber outlet 4, grease conduit 6, connection duct 50, drain conduit 5b, second cooking chamber outlet 10, bottom region 9a and part of the end region 9b of the vapour outlet duct 9, by-pass conduit 14, aspiration duct 7b, delivery duct 7c, circulation outlet 13, cooking chamber 2.

[0221] Preferably, during the washing phase, more preferably after all the washing liquid is loaded into the cooking chamber, and before switching on the circulation pump 7a, the heating device 8 is operated, so as to improve the degreasing effect of the washing liquid. More preferably the heating device 8 is operated for keeping the temperature within the cooking chamber at a prefixed temperature (e.g. 140°C), or within a range of temperatures (e.g. 120-160°C), to which corresponds a temperature of the water comprised between 70-80°C.

[0222] Preferably, during the washing phase, more preferably during activation of circulation pump 7a, the fan 20 is operated, so as to distribute the washing liquid falling from the circulation outlet 13 on all the surfaces internal to the cooking chamber 2.

[0223] Advantageously, the vortex preventing device 100 prevents the formation of air bubble that could prevent circulation pump 7a from properly priming.

[0224] Once the washing phase is completed (e.g. after a certain time, counted for example by the electronic controller 600 has elapsed from the beginning of this phase), circulation pump 7a is stopped, and the second valve 12 is opened (preferably automatically by the electronic controller 600), so as to drain the washing liquid, advantageously by gravity, through the oven outlet 5.

[0225] The automatic or semi-automatic cleaning process advantageously comprises a rinsing phase in which, after closing the second valve 12 (which can be done automatically by the electronic controller 600), third valve 16b is opened again (preferably automatically by the electronic controller 600), so as to take clean water within the cooking chamber 2.

[0226] Once the liquid level within the cooking chamber 2 has reached a prefixed value, and/or after a certain time has lapsed, third valve 16b is closed again (advantageously automatically by the electronic controller 600).

[0227] Then, preferably, circulation pump 7a is operated, so as to circulate the clean water through the circulation system 7, so as to remove residuals of detergent possibly remained therein.

[0228] In particular, the clean water is circulated through the first cooking chamber outlet 4, grease conduit 6, connection duct 50, drain conduit 5b, second cooking chamber outlet 10, bottom region 9a and part of the end region 9b of the vapour outlet duct 9, by-pass conduit 14, aspiration duct 7b, delivery duct 7c, circulation outlet 13, cooking chamber 2.

[0229] Once the rinsing phase is completed (e.g. after a certain time, counted for example by the electronic controller 600 has elapsed from the beginning of this phase), circulation pump 7a is stopped, and the second valve 12 is opened (preferably automatically by the electronic controller 600), so as to drain the water, advantageously by gravity, through the oven outlet 5.

[0230] One or more further rinsing phases, equal or substantially equal to the one just described, can be performed.

[0231] Preferably, during the rinsing phases the fan 20 is activated, so as to better distribute the rinsing liquid/clean water on all the surfaces internal to the cooking chamber 2.

[0232] Advantageously, before the last rinsing phase, a descaling phase can be performed, which, in the embodiment of Figure 2, is advantageously almost equal to a rinsing phase, with the difference that during the descaling phase a descaling additive, for example a descaling powder or tab, can be loaded (e.g. manually) into the cooking chamber 2, so as to generate a descaling liquid (i.e. water and descaling additive), which is circulated by the circulation system 7, so as to descale the surfaces that it contacts.

[0233] Preferably, the automatic or semi-automatic cleaning process can comprise, before the washing phase, a soaking phase; preferably, in the soaking phase, with the second valve 12 and the first valve 11 closed, third valve 16b can be opened (preferably automatically by the electronic controller 600), preferably until a prefixed water level is reached within the cooking chamber 2, and/or a prefixed time has lapsed until the third valve 16b has been opened. In the soaking phase, heating device 8 is switched on, so as to heat the water collected in the bottom 3 of the cooking chamber 2; then, after a certain time has lapsed, the second valve 12 is

opened, and soaking water is drained via the oven drain 5. Then the washing phase can be performed.

[0234] With reference to the embodiment of figure 3, the functioning of the cooking oven according to the invention is the following.

[0235] Once the foodstuff has been loaded into the cooking chamber 2, and the door 2a closed, the cooking process can be started; the heating device 8 and the fan 20 are operated, advantageously by the electronic controller 600 of the cooking oven 1, according to a specific cooking program selected and/or programmed by a user.

[0236] Also ventilation valve 22 is controlled, advantageously by the electronic controller 600 of the cooking oven 1, for keeping fresh air from the external environment into the cooking chamber 2, advantageously according to the specific cooking program selected and/or programmed by the user.

[0237] During the cooking process, the steam supply system 35 can be operated, preferably by the electronic controller 600, according to the specific cooking program selected and/or programmed by a user, in order to take a prefixed steam amount into the cooking chamber 2. In particular, after water is loaded into the water reservoir 37 via the seventh valve 41, water heater 38 can be operated in order to heat such water and generate steam, which is taken into the cooking chamber 2 via the steam duct 43.

[0238] During the cooking process, the vapour present in the cooking chamber 2, the steam supplied by the steam supply system 35 (if present) and the high internal temperature, increase the internal pressure, and, when the latter exceeds ambient pressure, vapour is expelled to external of the cooking chamber 2 via the second cooking chamber outlet 10 and the vapour outlet duct 9. Vapour outlet valve 45, if present, is controlled, preferably by the electronic controller 600, for selectively controlling the vapour discharge.

[0239] The quenching system 17, if provided, emits a jet of preferably fresh clean water, taken more preferably from external water mains, against the flow of vapour 400 flowing through the vapour outlet duct 9, cooling down and dehumidifying such a vapour; condensate resulting from this quenching process is collected in the bottom region 9a of the vapour outlet duct 9, and, preferably due to its slope, it is taken by gravity to the by-pass conduit 14, from which it is taken, still by gravity, to the drain conduit 5b, and to the oven outlet 5, from where it can be drained to the sewage pipes, not illustrated, of the building in which the cooking oven 1 is installed.

[0240] Advantageously, before reaching the oven outlet 5, the condensate reaches the air trap 5a (if provided), activating the latter (if not already activated by liquid present from previous usages of the cooking oven), so that vapour can't exit through it.

[0241] If condensate level within the vapour outlet duct 9 exceeds the level of the overflow conduit 26, it is drained by the latter directly to the oven outlet 5 (passing through the air trap 5a, if present).

[0242] During the cooking process, grease can fall from the overlying foodstuff to the bottom 3 of the cooking chamber 2, and it is collected into the cooking chamber outlet 4 and taken to the grease conduit 6, from which it is collected into the grease container 60.

[0243] Having provided two separated cooking chamber outlets, one dedicated to collect grease, reduces the possibility that grease could obstruct the second cooking chamber outlet 10 taking to the vapour outlet duct 9.

[0244] In the advantageous embodiment in which the bottom wall 3 of the cooking chamber 2 has a region 3a at least partially funnel-shaped at least at or in proximity to the inlet border 4a of first cooking chamber outlet 4, grease collected on this region 3a is very effectively taken by gravity into the first cooking chamber outlet 4.

[0245] In the embodiment of the invention in which the inlet border 10a of the second cooking chamber outlet 10 is placed at a raised position with respect to the inlet border 4a of the first cooking chamber outlet 4, if the grease collects in the bottom wall 3 of the cooking chamber, it enters firstly the first cooking chamber 4, and it is therefore drained to the grease conduit 6 before reaching the level of the second cooking chamber outlet 10.

[0246] In the advantageous embodiment, illustrated for example in figure 8, in which the cooking oven 1 comprises a shield element 300 for preventing grease from entering the second cooking chamber outlet 10, such a shield element 300 prevents also grease droplets falling from the foodstuff being cooked to directly enter the second cooking chamber outlet 10.

[0247] After the cooking process, the oven can be cleaned by the cleaning system 70; an automatic or semi-automatic cleaning process can be advantageously activated by the electronic controller 600, which operates on the electrically/electronically operated components of the cleaning system 70.

[0248] In the advantageous embodiment of figure 3, the automatic or semi-automatic cleaning process advantageously comprises a steam supply system descaling phase, in which the water reservoir 37 of the steam supply system 35 is preferably emptied by opening the eight valve 42, and a descaling additive is loaded in the additive drawer 28.

[0249] Then, with seventh valve 41, eight valve 42, and sixth valve 30 closed, the fifth valve 29 is opened (preferably automatically by the electronic controller 600), so that clean water enters the additive drawer 28, dissolves, preferably only partially, the descaling additive contained therein, forming a descaling solution (i.e. water and descaling additive) which is taken, due to the pressure of the water in the water mains, into the water reservoir 37 through the boiler cleaning duct 44.

[0250] Preferably, the water reservoir is only partially filled with the descaling solution coming from the drawer 28, since a part of the descaling additive should preferably remain in the additive drawer for being used in a further step of the automatic or semi-automatic cleaning process.

[0251] Advantageously the amount of water loaded into the water reservoir is controlled by a flowmeter, not illustrated, provided at or in series with the fifth valve 29, and preferably controlled by the electronic controller 600 in such a way to close the valve after a prefixed amount of water has flown into the additive drawer 28.

[0252] The electronic controller 600 is also preferably configured in such a way that, in addition or in alternative to the flowmeter, a time-based control of the opening of the fifth valve 29 is performed; in other words, the valve is closed after a certain prefixed time has lapsed until its opening.

[0253] More preferably, some further water is loaded into the water reservoir 37 by opening (preferably automatically by the electronic controller 600) the seventh valve 41, until a prefixed level within the reservoir 37 is reached, and/or a prefixed time has lapsed until the opening of such seventh valve 41. In this way a prefixed concentration of descaling additive in the descaling solution contained in the water reservoir is obtained. Then the seventh valve 41 is closed.

[0254] Advantageously, the water heater 38 is switched on (preferably automatically by the electronic controller 600), so as to increase the descaling effect.

[0255] Preferably, the water heater 38 is controlled, preferably by the electronic controller 600, in order to keep a prefixed temperature within the reservoir 37, for example 80°C; preferably the temperature is measured by a temperature sensor, not illustrated, provided in the water reservoir 37.

[0256] Preferably, the descaling solution is kept into the water reservoir 37 for a prefixed time, more preferably one hour and a half. Preferably, this time can be regulated by the user, for example operating on a user interface of the cooking oven 1.

[0257] With reference to the advantageous embodiment of figure 3, the automatic or semi-automatic cleaning process comprises also a washing phase in which, after having emptied the cooking chamber 2 a detergent, for example in form of a tablet or of powder, is placed in the bottom 3 of the cooking chamber, and the door 2a can be closed.

[0258] It is underlined that the steam supply system descaling phase and the above-mentioned washing phase can start contemporaneously, or one can start before the other.

[0259] Advantageously, in the washing phase, preferably while the water reservoir 37 is being descaled, or before or after this phase, with the second valve 12 and the first valve 11 closed, third valve 16b can be opened (preferably automatically by the electronic controller 600). The liquid level within the cooking chamber 2 is preferably detected, for example by a suitable level sensor, not illustrated, present within the cooking chamber 2, and/or by a flowmeter, not illustrated measuring the amount of water entering through the third valve 16b, and communicating this amount to the electronic controller 600, which is configured for calculating the liquid level from the amount of liquid entering through the third valve 16b.

[0260] Once the liquid level within the cooking chamber 2 has reached a prefixed value, and/or after a certain time has lapsed, third valve 16b is closed (advantageously automatically by the electronic controller 600).

[0261] The, circulation pump 7a is operated, so as to circulate the washing liquid (i.e. water mixed with the detergent present in the cooking chamber 2) through the circulation system 7.

[0262] In particular, the washing liquid is circulated through the first cooking chamber outlet 4, grease conduit 6, connection duct 50, drain conduit 5b, second cooking chamber outlet 10, bottom region 9a and part of the end region 9b of the vapour outlet duct 9, by-pass conduit 14, aspiration duct 7b, delivery duct 7c, circulation outlet 13, cooking chamber 2.

[0263] Preferably, during the washing phase, more preferably after all the washing liquid is loaded into the cooking chamber 2, and before switching on the circulation pump 7a, the heating device 8 is operated, so as to improve the degreasing effect of the washing liquid. More preferably the heating device 8 is operated for keeping the temperature within the cooking chamber at a prefixed temperature (e.g. 140°C), or within a range of temperatures (e.g. 120-160°C), to which corresponds a temperature of the water comprised between 70-80°C.

[0264] Preferably, during the washing phase, more preferably while the circulation pump 7a is operated, the fan 20 is operated, so as to distribute the washing liquid falling from the circulation outlet 13 on all the surfaces internal to the cooking chamber 2.

[0265] Advantageously, the vortex preventing device 100 prevents the formation of air bubble that could prevent circulation pump 7a from properly priming.

[0266] Once the washing phase is completed (e.g. after a certain time, counted for example by the electronic controller 600 has elapsed from the beginning of this phase), circulation pump 7a is stopped, and the second valve 12 is opened (preferably automatically by the electronic controller 600), so as to drain the washing liquid, advantageously by gravity, through the oven outlet 5.

[0267] The automatic or semi-automatic cleaning process advantageously comprises a rinsing phase in which, after closing the second valve 12 (which can be done automatically by the electronic controller 600), third valve 16b is opened again (preferably automatically by the electronic controller 600), so as to take clean water within the cooking chamber 2.

[0268] Once the liquid level within the cooking chamber 2 has reached a prefixed value, and/or after a certain time has lapsed, third valve 16b is closed again (advantageously automatically by the electronic controller 600).

[0269] Then, preferably, circulation pump 7a is operated, so as to circulate the clean water through the circulation system 7, so as to remove residuals of detergent possibly remained therein.

[0270] In particular, the clean water is circulated

through the first cooking chamber outlet 4, grease conduit 6, connection duct 50, drain conduit 5b, second cooking chamber outlet 10, bottom region 9a and part of the end region 9b of the vapour outlet duct 9, by-pass conduit 14, aspiration duct 7b, delivery duct 7c, circulation outlet 13, cooking chamber 2.

[0271] Once the rinsing phase is completed (e.g. after a certain time, counted for example by the electronic controller 600 has elapsed from the beginning of this phase), circulation pump 7a is stopped, and the second valve 12 is opened (preferably automatically by the electronic controller 600), so as to drain the water, advantageously by gravity, through the oven outlet 5.

[0272] Preferably, during the rinsing phases the fan 20 is activated, so as to better distribute the rinsing liquid/clean water on all the surfaces internal to the cooking chamber 2.

[0273] One or more further rinsing phases, equal or substantially equal to the one just described, can be performed.

[0274] After one or more rinsing phases, a descaling phase is advantageously performed.

[0275] In the embodiment of figure 3, preferably, in the descaling phase, with first valve 11 and second valve 12 closed, and sixth valve 30 opened, fifth valve 29 is opened (preferably automatically by the electronic controller 600), so that clean water enters the additive drawer 28, dissolves, preferably completely, the descaling additive contained therein, forming a descaling solution (i.e. water and descaling additive), and goes by gravity through sixth valve 30, to the aspiration conduit 7b.

[0276] Advantageously the amount of water loaded into the water reservoir is controlled by a flowmeter, not illustrated, provided at or in series with the fifth valve 29, and preferably controlled by the electronic controller 600 in such a way to close the valve after a prefixed amount of water has flown into the additive drawer 28.

[0277] The electronic controller 600 is also preferably configured in such a way that, in addition or in alternative to the flowmeter, a time-based control of the opening of the fifth valve 29 is performed; in other words, the valve is closed after a certain prefixed time has lapsed until its opening.

[0278] In the descaling phase, circulation pump 7a is advantageously operated, so as to circulate the descaling liquid (i.e. water mixed with the descaling additive present in the additive drawer 28) through the circulation system 7.

[0279] In particular, the descaling liquid is circulated through the first cooking chamber outlet 4, grease conduit 6, connection duct 50, drain conduit 5b, second cooking chamber outlet 10, bottom region 9a and part of the end region 9b of the vapour outlet duct 9, by-pass conduit 14, aspiration duct 7b, delivery duct 7c, circulation outlet 13, cooking chamber 2.

[0280] Preferably, during the descaling phase, the heating device 8 is operated, so as to improve the descaling effect of the descaling liquid.

[0281] Preferably, during the descaling phase, the fan 20 is operated, so as to distribute the descaling liquid falling from the circulation outlet 13 on all the surfaces internal to the cooking chamber 2.

[0282] Once the descaling phase is completed (e.g. after a certain time, counted for example by the electronic controller 600 has elapsed from the beginning of this phase), circulation pump 7a is stopped, and the second valve 12 is opened (preferably automatically by the electronic controller 600), so as to drain the descaling liquid, advantageously by gravity, through the oven outlet 5.

[0283] Preferably, but not necessarily, at the same time with the completion of the descaling phase, the steam supply system descaling phase can be completed; in this case, preferably automatically by the electronic controller 600, water heater 38 is switched off, eight valve 42 is opened, and the descaling solution present in the water reservoir 37 drained, advantageously by gravity, through the oven outlet 5.

[0284] Finally, a further rinsing phase, equal to the ones described above, can be performed, so as to remove possible residuals of descaling solution from the internal of the oven.

[0285] In addition, the automatic or semi-automatic cleaning process advantageously comprises a steam supply system rinsing phase, comprising closing the eight valve 42 and opening the seventh valve 41 for a prefixed time, and/or until a prefixed water level is reached within the water reservoir, so as to load clean water within the water reservoir 37, and finally, after a prefixed time has lapsed, opening the eight valve 42, so as to drain, by gravity, rinsing water via the oven outlet 5.

[0286] Preferably, the automatic or semi-automatic cleaning process can comprise, before the washing phase, a soaking phase; preferably, in the soaking phase, with the second valve 12 and the first valve 11 closed, third valve 16b can be opened (preferably automatically by the electronic controller 600), preferably until a prefixed water level is reached within the cooking chamber 2, and/or a prefixed time has lapsed until the third valve 16b has been opened. In the soaking phase, heating device 8 is switched on, so as to heat the water collected in the bottom 3 of the cooking chamber 2; then, after a certain time has lapsed, the second valve 12 is opened, and soaking water is drained via the oven drain 5. Then the washing phase can be performed.

[0287] With reference to the embodiment of figure 4, its functioning differs from the above described functioning of the embodiment of figure 3 only because:

- during the washing phase of the automatic or semi-automatic cleaning process, the detergent is not placed in the bottom 3 of the cooking chamber by the user, but it is taken directly into the introduction system 16, preferably into the introduction conduit 16a, by operating additive pump 34b, in such a way to pump the washing additive out of the additive container 32b and pump the washing additive in the in-

troduction system 16;

- during the steam supply system descaling phase, and during the descaling phase, preferably, the descaling additive is not manually loaded into the additive drawer 28, but it is loaded into the additive drawer by operating additive pump 34a, in such a way to pump the descaling additive out of the additive container 32a and to pump the descaling additive in the additive drawer 28.

[0288] In the embodiment of figure 4, during the automatic or semi-automatic cleaning process, the amount of descaling additive supplied to the additive drawer 28 can be advantageously controlled by operating the additive pump 34a for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33a, for example by a flowmeter, not illustrated.

[0289] In the embodiment of figure 4, during the automatic or semi-automatic cleaning process, the amount of washing agent supplied to the introduction system 16 is controlled by operating the additive pump 34b for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33b, for example by a flowmeter, not illustrated.

[0290] It is underlined that the embodiment of figure 4 allows loading also manually an additive into the additive drawer 28 (for example if the additive container 32a is empty, and/or for adding a further kind of additive in addition to the one contained in additive container 32a). With reference to the embodiment of figure 5, its functioning differs from the above described functioning of the embodiment of figure 1 only because:

- during the washing phase of the automatic or semi-automatic cleaning process, the detergent is not placed in the bottom 3 of the cooking chamber by the user, but it is taken directly into the introduction system 16, preferably into the introduction conduit 16a, by operating additive pump 34b, in such a way to pump the washing additive out of the additive container 32b and pump the washing additive in the introduction system 16, from which it is taken, together with the water entering the third valve 16b, into the cooking chamber 2.;
- during the descaling phase, the descaling additive is not manually loaded into the cooking chamber 2, but it is loaded into the introduction system by operating additive pump 34a, in such a way to pump the descaling additive out of the additive container 32a and to pump the washing additive in the introduction system 16, from which it is taken, together with the water entering the third valve 16b, into the cooking chamber 2.

[0291] In the embodiment of figure 5, during the automatic or semi-automatic cleaning process, the amount of descaling additive supplied to introduction system 16 can be advantageously controlled by operating the additive pump 34a for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33a, for example by a flowmeter, not illustrated.

[0292] In the embodiment of figure 5, during the automatic or semi-automatic cleaning process, the amount of washing agent supplied to the introduction system 16 is controlled by operating the additive pump 34b for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33b, for example by a flowmeter, not illustrated.

[0293] With reference to the embodiment of figure 6, its functioning differs from the above described functioning of the embodiment of figure 1 only because:

- during the washing phase of the automatic or semi-automatic cleaning process, the detergent is not placed in the bottom 3 of the cooking chamber by the user, but it is taken directly into the introduction system 16, preferably into the introduction conduit 16a, by operating additive pump 34b, in such a way to pump the washing additive out of the additive container 32b and pump the washing additive in the introduction system 16, from which it is taken, together with the water entering the third valve 16b, into the cooking chamber 2.;
- during the descaling phase, preferably, the descaling additive is not manually loaded into the cooking chamber 2, but is loaded into the additive drawer 28 by operating additive pump 34a, in such a way to pump the descaling additive out of the additive container 32a and to pump the descaling additive in the additive drawer 28.

[0294] In the embodiment of figure 6, during the automatic or semi-automatic cleaning process, the amount of descaling additive supplied to the additive drawer 28 can be advantageously controlled by operating the additive pump 34a for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33a, for example by a flowmeter, not illustrated.

[0295] In the embodiment of figure 6, during the automatic or semi-automatic cleaning process, the amount of washing agent supplied to the introduction system 16 is controlled by operating the additive pump 34b for a prefixed time, and/or by measuring the amount of liquid flowing through additive delivery conduit 33b, for example by a flowmeter, not illustrated.

[0296] It is underlined that the embodiment of figure 6 allows loading also manually an additive into the additive drawer 28 (for example if the additive container 32a is empty, and/or for adding a further kind of additive in addition to the one contained in additive container 32a). It is seen therefore how the invention achieves the proposed aim and objects, there being provided a cooking oven which, thanks to two distinct cooking chamber outlets, one taking to the grease conduit, and the other to the vapour outlet duct, the risk that grease dripping from the foodstuff and collected in the bottom wall of the cook-

ing chamber can obstruct or clog the vapour outlet duct, and the related above mentioned problems, is highly reduced. In addition, the two cooking chamber outlets are positioned in a region of the cooking chamber, i.e. its bottom wall, in which they don't hinder the circulation of air within the cooking chamber, and therefore they don't affect, or only marginally affect, the thermal uniformity within the cooking chamber.

[0297] The advantageous embodiment in which the first cooking chamber outlet and the second cooking chamber outlet and are reciprocally arranged in such a way that the grease collected in the bottom wall of the cooking chamber enters firstly/more easily the first cooking chamber outlet, ensures that at most a very small amount of grease could enter the second cooking chamber outlet. As explained, this is obtained by placing the inlet border of the second cooking chamber outlet at a raised position with respect to the inlet border of the first cooking chamber outlet. In an advantageous further development, this can be obtained by positioning the inlet border of first cooking chamber outlet at a funnel-shaped region of the bottom wall.

Claims

1. Cooking oven (1) for foodstuffs comprising:

- a cooking chamber (2), wherein foodstuffs can be placed for being cooked, having a bottom wall (3) provided with a first cooking chamber outlet (4) positioned in such a way to receive grease collected in said bottom wall (3);
- a grease conduit (6) configured for draining grease from said cooking chamber (2);

wherein said first cooking chamber outlet (4) is fluidly connected to said grease conduit (6),
wherein said cooking oven further comprises:

- a heating device (8) configured for heating the internal of said cooking chamber (2),
- a vapour outlet duct (9) configured for discharging vapour from said cooking chamber (2)

characterized in that

said bottom wall (3) of said cooking chamber (2) is provided with a second cooking chamber outlet (10), distinct from said first cooking chamber outlet (4) and fluidly connected to said vapour outlet duct (9), and
wherein the inlet border (10a) of said second cooking chamber outlet (10) is placed at a raised position with respect to the inlet border (4a) of said first cooking chamber outlet (4).

2. Cooking oven (1) according to claim 1, wherein said first cooking chamber outlet (4) and second cooking chamber outlet (10) are reciprocally positioned and/or arranged in such a way that the grease collected in said bottom wall (3) enters firstly/more easily said first cooking chamber outlet (4) than said second cooking chamber outlet (10).

3. Cooking oven (1), according to claim 1 or 2, wherein said bottom wall (3a) of the cooking chamber (2) is at least partially funnel-shaped, at least at or in proximity to the inlet border (4a) of said first cooking chamber outlet (4).

4. Cooking oven (1), according to one or more of the previous claims, wherein said second cooking chamber outlet (10) is fluidly connected, in addition to said vapour outlet duct (9), to said grease conduit (6).

5. Cooking oven (1), according to claim 4, wherein said second cooking chamber outlet (10) is fluidly connected to said grease conduit (6) via a connection duct (50) whose end portion (50a) protrudes within said grease conduit (6), substantially perpendicularly to the internal surface of the latter.

6. Cooking oven (1) according to one or more of the previous claims, comprising a cleaning system (70) comprising a circulation system (7) configured for pumping liquid out of said cooking chamber (2) and for pumping such liquid, or a part thereof, again in said cooking chamber (2).

7. Cooking oven (1), according to claim 6, wherein said first cooking chamber outlet (4) is fluidly connected, in addition to said grease conduit (6), to said circulation system (7).

8. Cooking oven (1), according to claim 6 or 7, wherein said second cooking chamber outlet (10) is fluidly connected, in addition to said vapour outlet duct (9), to said circulation system (7).

9. Cooking oven (1) according to one or more of claims 6 to 8, wherein said circulation system (7) comprises a circulation pump (7a), an aspiration conduit (7b) connecting said circulation pump (7a) to said first cooking chamber outlet (4) and/or to said second cooking chamber outlet (10), and a delivery conduit (7c) connecting said circulation pump (7a) to a washing/rinsing liquid circulation outlet (13) provided in said cooking chamber (2) and configured for allowing washing/rinsing liquid to enter said cooking chamber (2).

10. Cooking oven (1) according to one or more of claims 6 to 9, wherein said cleaning system (70) comprises a washing/rinsing liquid introduction system (16) configured for taking washing/rinsing liquid within

said cooking chamber (2), said washing/rinsing liquid introduction system (16) comprising an introduction conduit (16a) fluidly connected to said cooking chamber (2) and configured for selectively supplying into the latter washing and/or rinsing liquid.

11. Cooking oven (1) according to claim 10 when depending on claim 9, wherein the outlet (16c) of said introduction conduit (16a) is separated from said washing/rinsing liquid circulation outlet (13), or wherein the outlet of said introduction conduit (16a) into said cooking chamber (2) coincides with said washing/rinsing liquid circulation outlet (13).

12. Cooking oven (1) according to one or more of claim 7 to 11, wherein said aspiration conduit (7b) is fluidly connected to said second cooking chamber outlet (10) via a by-pass conduit (14) fluidly connecting said aspiration conduit (7b) to said vapour outlet duct (9), to which said second cooking chamber outlet (10) is fluidly connected.

13. Cooking oven (1) according to one or more of the previous claims, wherein said cleaning system (70) comprises a washing/rinsing additive supplying system (27) configured for supplying washing and/or rinsing additives to the internal of said cooking chamber (2), and/or a washing/rinsing additive multi-dosing system (31) configured for supplying to the internal of said cooking chamber (2) metered amounts of washing and/or rinsing additives.

14. Cooking oven (1) according to one or more of the previous claims, comprising a steam supply system (35) configured for producing and supplying steam into the cooking chamber (2), wherein said cleaning system (70) is configured for supplying a washing/rinsing liquid to said steam supply system (35).

Patentansprüche

1. Garofen (1) für Lebensmittel, umfassend:

- einen Garraum (2), in den Lebensmittel zum Garen eingelegt werden können, der eine Bodenwand (3) aufweist, die mit einem ersten Garraumauslass (4) bereitgestellt ist, der so angeordnet ist, dass er in der Bodenwand (3) gesammeltes Fett aufnimmt;
- eine Fettleitung (6), die zum Ableiten von Fett aus dem Garraum (2) konfiguriert ist;

wobei der erste Garraumauslass (4) mit der Fettleitung (6) fluidverbunden ist,
wobei der Garofen ferner Folgendes umfasst:

- eine Heizvorrichtung (8), die zum Heizen des Inneren des Garraums (2) konfiguriert ist,
- ein Dampfauslasskanal (9), der zum Ablassen von Dampf aus dem Garraum (2) konfiguriert ist,

dadurch gekennzeichnet, dass

die Bodenwand (3) des Garraums (2) mit einem zweiten Garraumauslass (10) bereitgestellt ist, der sich von dem ersten Garraumauslass (4) unterscheidet und mit dem Dampfauslasskanal (9) fluidverbunden ist, und
wobei der Einlassrand (10a) des zweiten Garraumauslasses (10) in einer erhöhten Position in Bezug auf den Einlassrand (4a) des ersten Garraumauslasses (4) angeordnet ist.

2. Garofen (1) nach Anspruch 1, wobei der erste Garraumauslass (4) und der zweite Garraumauslass (10) so wechselseitig positioniert und/oder angeordnet sind, dass das in der Bodenwand (3) gesammelte Fett zuerst/leichter in den ersten Garraumauslass (4) als in den zweiten Garraumauslass (10) eintritt.

3. Garofen (1) nach Anspruch 1 oder 2, wobei die Bodenwand (3a) des Garraums (2) mindestens teilweise trichterförmig ist, mindestens an oder in der Nähe des Einlassrandes (4a) des ersten Garraumauslasses (4).

4. Garofen (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei der zweite Garraumauslass (10) zusätzlich zu dem Dampfauslasskanal (9) mit der Fettleitung (6) fluidverbunden ist.

5. Garofen (1) nach Anspruch 4, wobei der zweite Garraumauslass (10) mit der Fettleitung (6) über einen Verbindungskanal (50) fluidverbunden ist, dessen Endabschnitt (50a) in die Fettleitung (6) im Wesentlichen senkrecht zu deren Innenfläche derselben hineinragt.

6. Garofen (1) nach einem oder mehreren der vorhergehenden Ansprüche, umfassend ein Reinigungssystem (70), umfassend ein Zirkulationssystem (7), das zum Pumpen von Flüssigkeit aus dem Garraum (2) und zum erneuten Pumpen dieser Flüssigkeit oder eines Teils davon in den Garraum (2) konfiguriert ist.

7. Garofen (1) nach Anspruch 6, wobei der erste Garraumauslass (4) zusätzlich zu der Fettleitung (6) mit dem Zirkulationssystem (7) fluidverbunden ist.

8. Garofen (1) nach Anspruch 6 oder 7, wobei der zweite Garraumauslass (10) zusätzlich zu dem Dampfauslasskanal (9) mit dem Zirkulationssystem (7) fluidverbunden ist.

9. Garofen (1) nach einem oder mehreren der Ansprüche 6 bis 8, wobei das Zirkulationssystem (7) eine Zirkulationspumpe (7a) umfasst, eine Ansaugleitung (7b), die die Zirkulationspumpe (7a) mit dem ersten Garraumauslass (4) und/oder dem zweiten Garraumauslass (10) verbindet und eine Zufuhrleitung (7c), die die Umwälzpumpe (7a) mit einem Wasch-/Spülflüssigkeits-Zirkulationsauslass (13) verbindet, der in dem Garraum (2) bereitgestellt und zum Ermöglichen des Eintretens von Wasch-/Spülflüssigkeit in den Garraum (2) konfiguriert ist.

10. Garofen (1) nach einem oder mehreren der Ansprüche 6 bis 9, wobei das Reinigungssystem (70) ein Wasch-/Spülflüssigkeits-Einführsystem (16) umfasst, das zum Aufnehmen von Wasch-/Spülflüssigkeit innerhalb des Garraums (2) konfiguriert ist, wobei das Wasch-/Spülflüssigkeits-Einführsystem (16) eine Einführleitung (16a) umfasst, die mit dem Garraum (2) fluidverbunden ist und zum selektiven Zuführen von Wasch- und/oder Spülflüssigkeit in dieselbe konfiguriert ist.

11. Garofen (1) nach Anspruch 10, wenn abhängig von Anspruch 9, wobei der Auslass (16c) der Einführleitung (16a) von dem Wasch-/Spülflüssigkeits-Zirkulationsauslass (13) getrennt ist, oder wobei der Auslass der Einführleitung (16a) in den Garraum (2) mit dem Wasch-/Spülflüssigkeits-Zirkulationsauslass (13) zusammenfällt.

12. Garofen (1) nach einem oder mehreren der Ansprüche 7 bis 11, wobei die Ansaugleitung (7b) mit dem zweiten Garraumauslass (10) über eine Bypassleitung (14) fluidverbunden ist, die die Ansaugleitung (7b) mit dem Dampfauslasskanal (9) fluidverbindet, mit dem der zweite Garraumauslass (10) fluidverbunden ist.

13. Garofen (1) nach einem oder mehreren der vorhergehenden Ansprüche, wobei das Reinigungssystem (70) ein Wasch-/Spülzusatz-Zufuhrsystem (27) umfasst, das zum Zuführen von Wasch- und/oder Spülzusätzen in das Innere des Garraums (2) konfiguriert ist, und/oder ein Wasch-/Spülzusatz-Mehrfachdosiersystem (31) umfasst, das zum Zuführen dosierter Mengen von Wasch- und/oder Spülzusätzen in das Innere des Garraums (2) konfiguriert ist.

14. Garofen (1) nach einem oder mehreren der vorhergehenden Ansprüche, umfassend ein Dampfzufuhrsystem (35), das zum Erzeugen und Zuführen von Dampf in den Garraum (2) konfiguriert ist, wobei das Reinigungssystem (70) zum Zuführen einer Wasch-/Spülflüssigkeit an das Dampfzufuhrsystem (35) konfiguriert ist.

Revendications

1. Four de cuisson (1) pour produits alimentaires comprenant :

- une chambre de cuisson (2), dans laquelle des aliments peuvent être placés pour être cuits, comportant une paroi de fond (3) pourvue d'une première sortie de chambre de cuisson (4) positionnée de manière à recevoir la graisse collectée dans ladite paroi de fond (3) ;
- un conduit de graisse (6) configuré pour évacuer la graisse de ladite chambre de cuisson (2) ;

dans lequel ladite sortie de la première chambre de cuisson (4) est raccordée fluidiquement audit conduit de graisse (6),
dans lequel ledit four de cuisson comprend en outre :

- un dispositif de chauffage (8) configuré pour chauffer l'intérieur de ladite chambre de cuisson (2),
- un conduit de sortie de vapeur (9) configuré pour évacuer la vapeur de ladite chambre de cuisson (2),

caractérisé en ce que

ladite paroi de fond (3) de ladite chambre de cuisson (2) est pourvue d'une deuxième sortie de chambre de cuisson (10), distincte de ladite première sortie de chambre de cuisson (4) et raccordée fluidiquement audit conduit de sortie de vapeur (9), et
dans lequel le bord d'entrée (10a) de ladite sortie de la deuxième chambre de cuisson (10) est placé dans une position surélevée par rapport au bord d'entrée (4a) de ladite sortie de la première chambre de cuisson (4).

2. Four de cuisson (1) selon la revendication 1, dans lequel ladite première sortie de chambre de cuisson (4) et la sortie de la deuxième chambre de cuisson (10) sont positionnées réciproquement et/ou disposées de telle manière que la graisse collectée dans ladite paroi de fond (3) pénètre d'abord/plus facilement dans ladite sortie de la première chambre de cuisson (4) que dans ladite sortie de la deuxième chambre de cuisson (10).

3. Four de cuisson (1), selon la revendication 1 ou 2, dans lequel ladite paroi de fond (3a) de la chambre de cuisson (2) est au moins partiellement en forme d'entonnoir, au moins au niveau ou à proximité du bord d'entrée (4a) de ladite première sortie de chambre de cuisson (4).

4. Four de cuisson (1), selon une ou plusieurs des revendications précédentes, dans lequel ladite sortie de la deuxième chambre de cuisson (10) est raccordée fluidiquement, en plus dudit conduit de sortie de vapeur (9), audit conduit de graisse (6).

5. Four de cuisson (1), selon la revendication 4, dans lequel ladite deuxième sortie de chambre de cuisson (10) est raccordé fluidiquement audit conduit de graisse (6) via un conduit de raccordement (50) dont la partie d'extrémité (50a) dépasse en saillie à l'intérieur dudit conduit de graisse (6), sensiblement perpendiculairement à la surface interne de ce dernier.

6. Four de cuisson (1) selon une ou plusieurs des revendications précédentes, comprenant un système de nettoyage (70) comprenant un système de circulation (7) configuré pour pomper du liquide hors de ladite chambre de cuisson (2) et pour pomper un tel liquide, ou une partie de celui-ci, toujours dans ladite chambre de cuisson (2).

7. Four de cuisson (1), selon la revendication 6, dans lequel ladite première sortie de chambre de cuisson (4) est raccordée fluidiquement, en plus dudit conduit de graisse (6), audit système de circulation (7).

8. Four de cuisson (1), selon la revendication 6 ou 7, dans lequel ladite sortie de la deuxième chambre de cuisson (10) est raccordée fluidiquement, en plus dudit conduit de sortie de vapeur (9), audit système de circulation (7).

9. Four de cuisson (1) selon une ou plusieurs des revendications 6 à 8, dans lequel ledit système de circulation (7) comprend une pompe de circulation (7a), un conduit d'aspiration (7b) raccordant ladite pompe de circulation (7a) à ladite première sortie de chambre (4) et/ou à ladite deuxième sortie de chambre de cuisson (10) et un conduit de refoulement (7c) raccordant ladite pompe de circulation (7a) à une sortie de circulation de liquide de lavage/rinçage (13) prévue dans ladite chambre de cuisson (2) et configurée pour permettre au liquide de lavage/rinçage de pénétrer dans ladite chambre de cuisson (2).

10. Four de cuisson (1) selon une ou plusieurs des revendications 6 à 9, dans lequel ledit système de nettoyage (70) comprend un système d'introduction de liquide de lavage/rinçage (16) configuré pour prélever du liquide de lavage/rinçage à l'intérieur de ladite chambre de cuisson (2), ledit système d'introduction de liquide de lavage/rinçage (16) comprenant un conduit d'introduction (16a) raccordé fluidiquement à ladite chambre de cuisson (2) et configuré pour alimenter sélectivement cette dernière en liquide de lavage et/ou de rinçage.

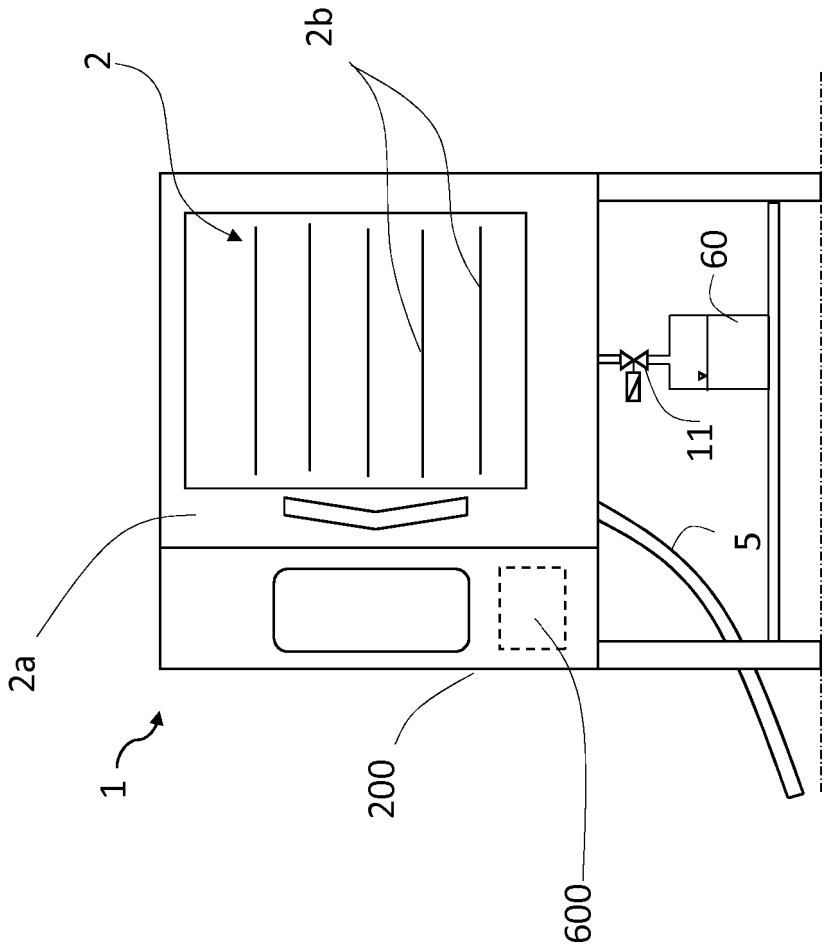
11. Four de cuisson (1) selon la revendication 10 lorsqu'elle dépend de la revendication 9, dans lequel la sortie (16c) dudit conduit d'introduction (16a) est séparée de ladite sortie de circulation de liquide de lavage/rinçage (13) ou dans lequel la sortie dudit conduit d'introduction (16a) dans ladite chambre de cuisson (2) coïncide avec ladite sortie de circulation de liquide de lavage/rinçage (13).

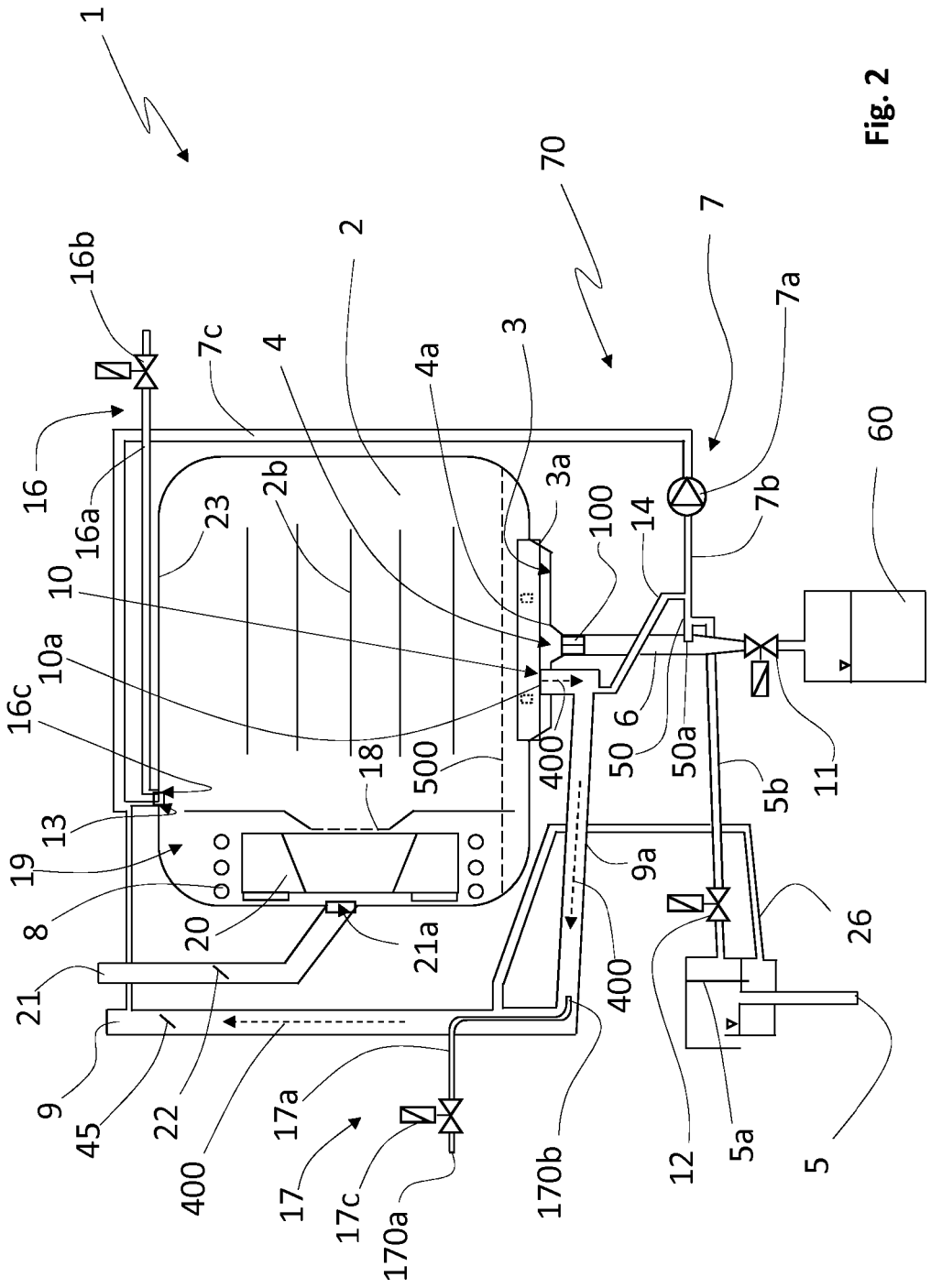
12. Four de cuisson (1) selon une ou plusieurs des revendications 7 à 11, dans lequel ledit conduit d'aspiration (7b) est raccordé fluidiquement à ladite sortie de la deuxième chambre de cuisson (10) via un conduit de dérivation (14) raccordant fluidiquement ladite aspiration conduit (7b) audit conduit de sortie de vapeur (9), auquel ladite sortie de la deuxième chambre de cuisson (10) est raccordée fluidiquement.

13. Four de cuisson (1) selon une ou plusieurs des revendications précédentes, dans lequel ledit système de nettoyage (70) comprend un système d'alimentation en additif de lavage/rinçage (27) configuré pour fournir des additifs de lavage et/ou de rinçage à l'intérieur de ladite chambre de cuisson (2), et/ou un système de multi-dosage d'additif de lavage/rinçage (31) configuré pour fournir à l'intérieur de ladite chambre de cuisson (2) des quantités dosées d'additifs de lavage et/ou rinçage.

14. Four de cuisson (1) selon une ou plusieurs des revendications précédentes, comprenant un système d'alimentation en vapeur (35) configuré pour produire et fournir de la vapeur dans la chambre de cuisson (2), dans lequel ledit système de nettoyage (70) est configuré pour fournir un liquide de lavage/rinçage audit système d'alimentation en vapeur (35).

Fig. 1

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10a
16c
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17c
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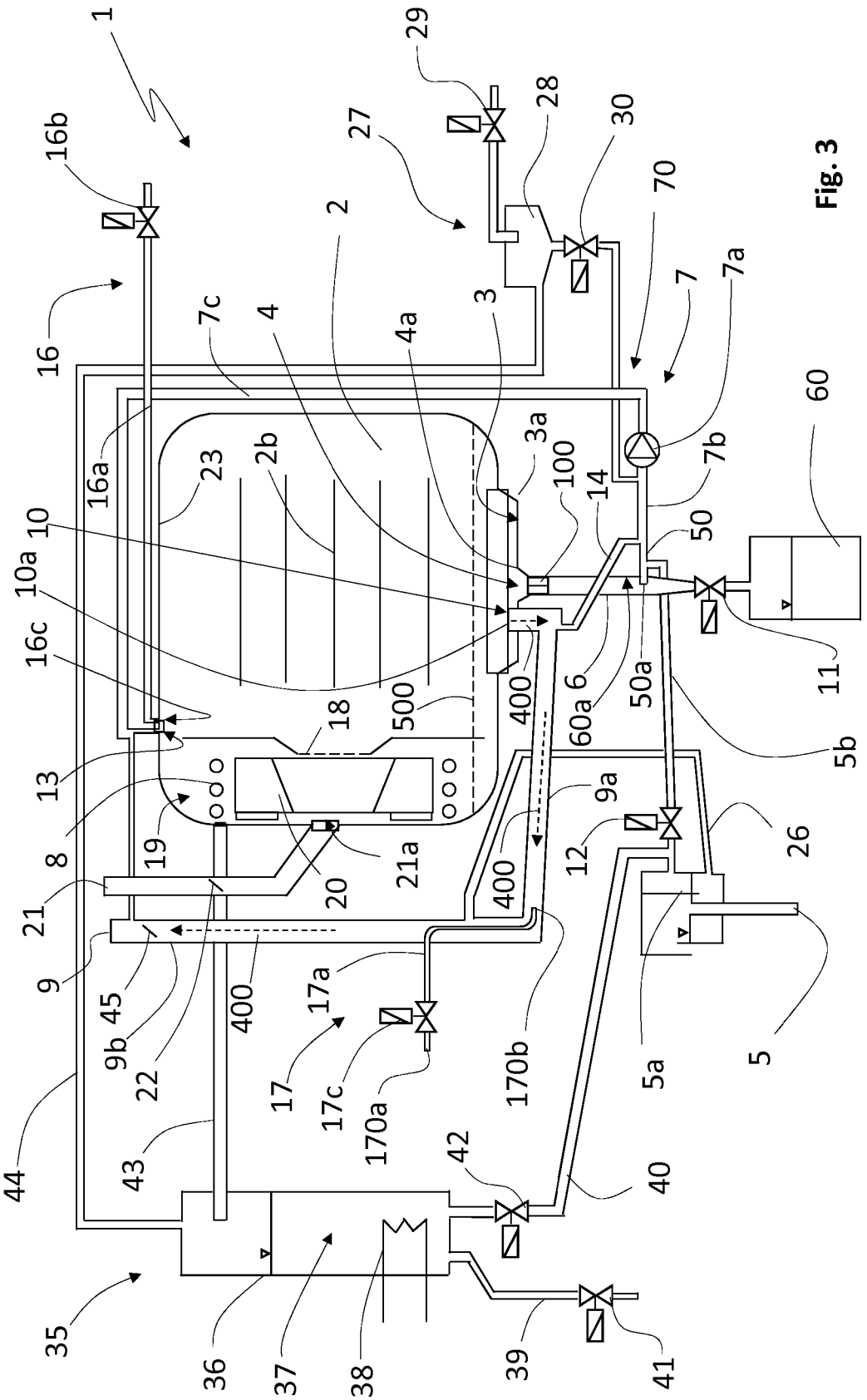
170b
12
5a
5

Fig. 2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7b
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11
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10a
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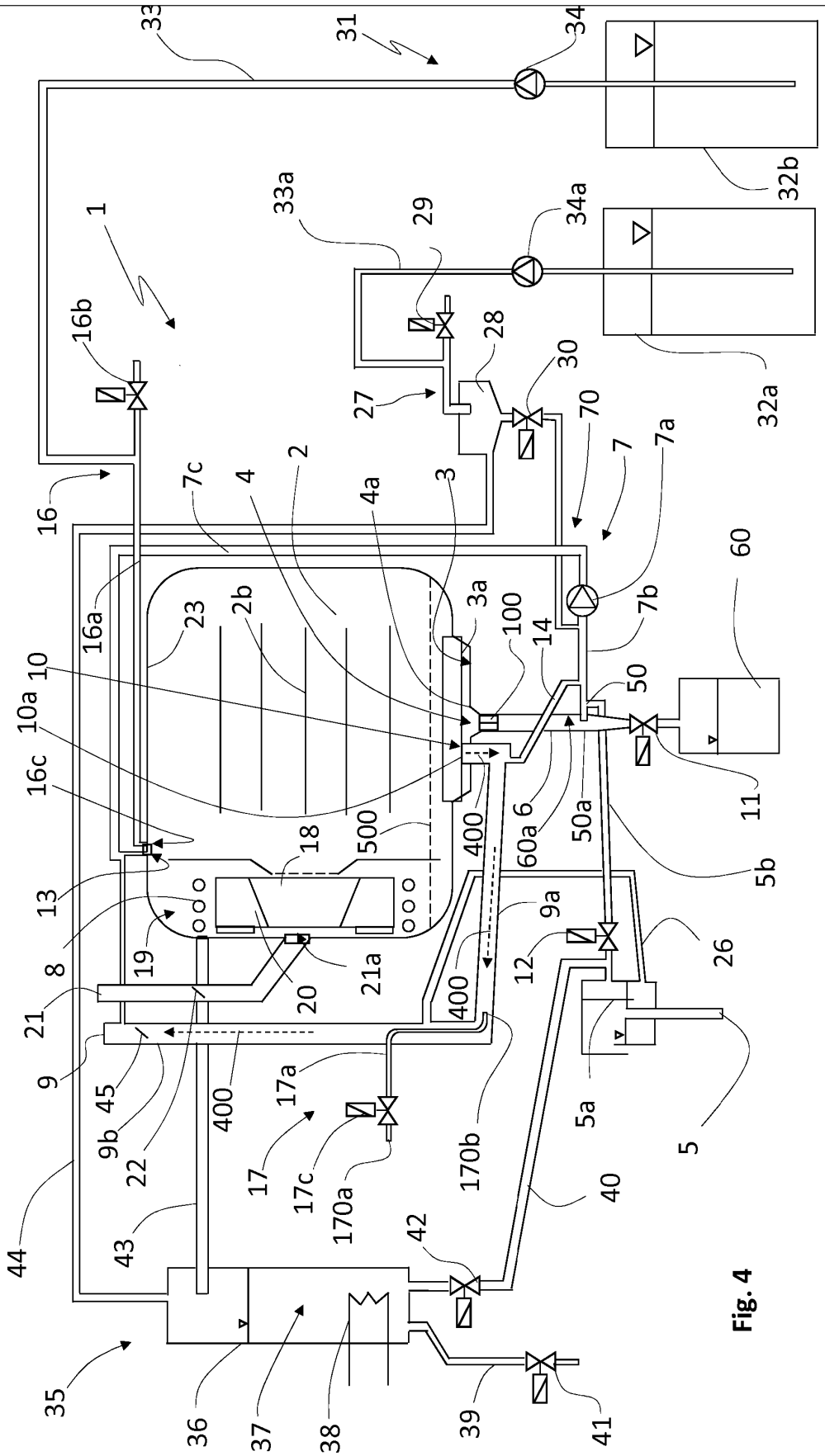
Fig. 3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100
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7b
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16c
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Fig. 4

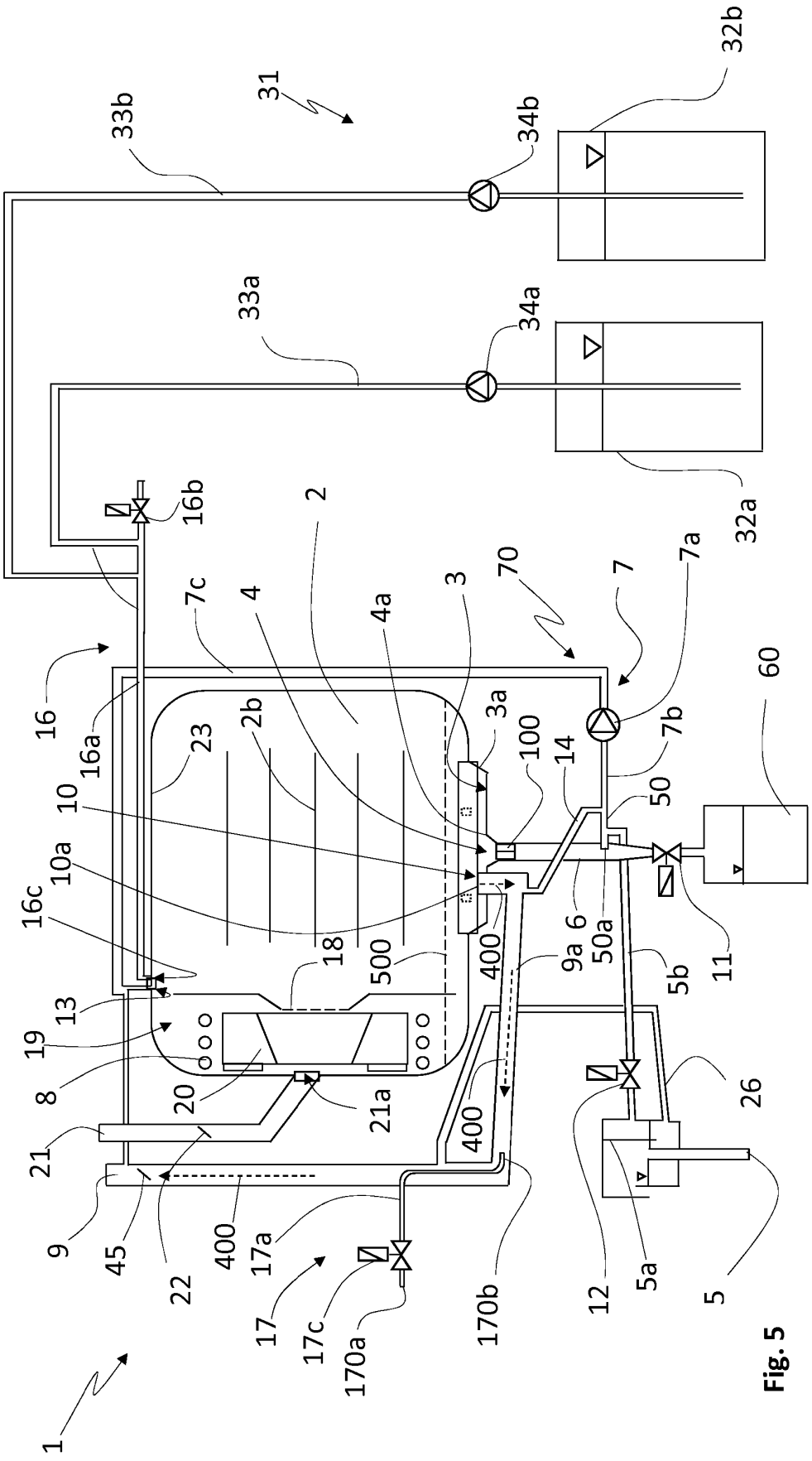
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Fig. 5

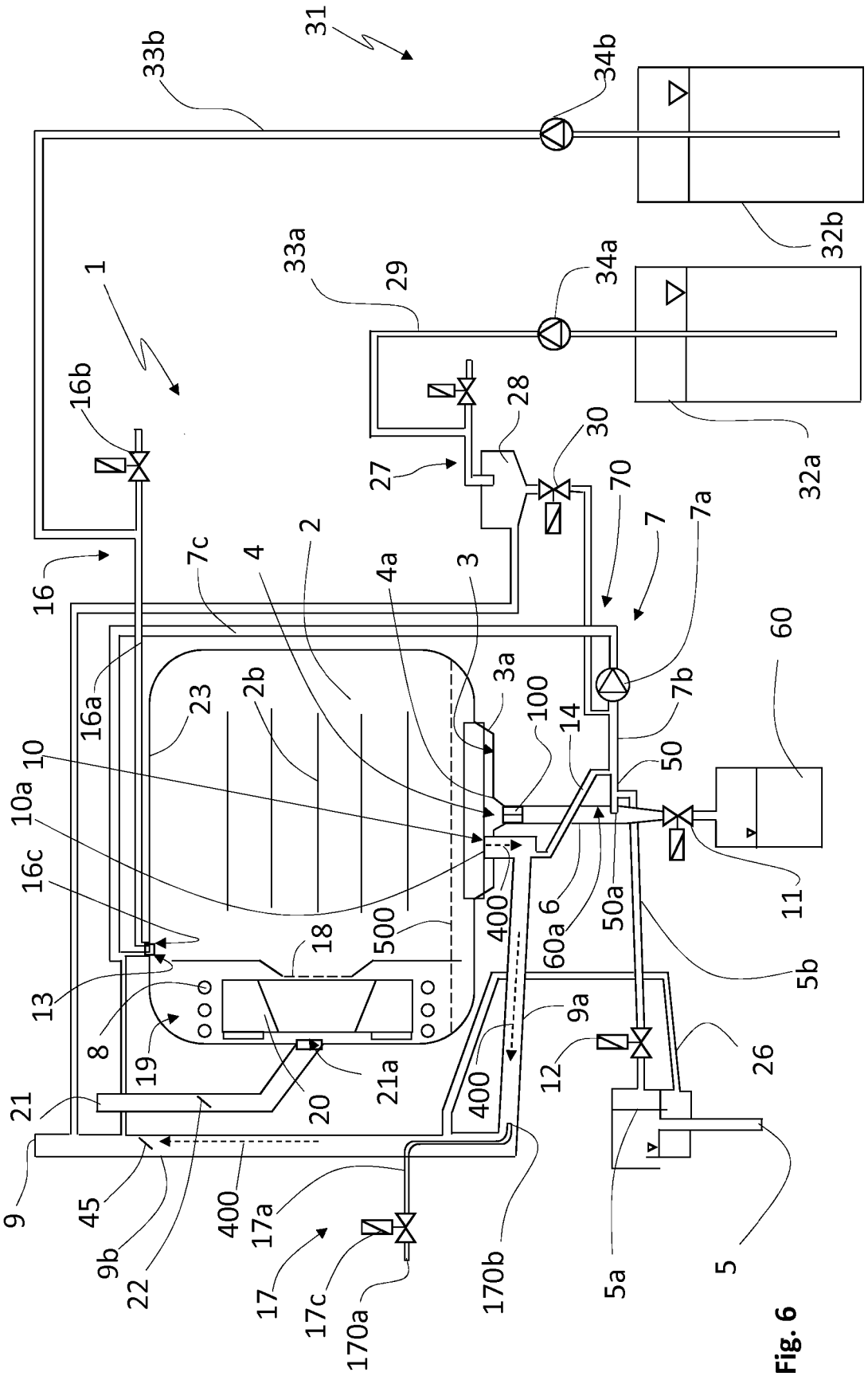
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Fig. 6

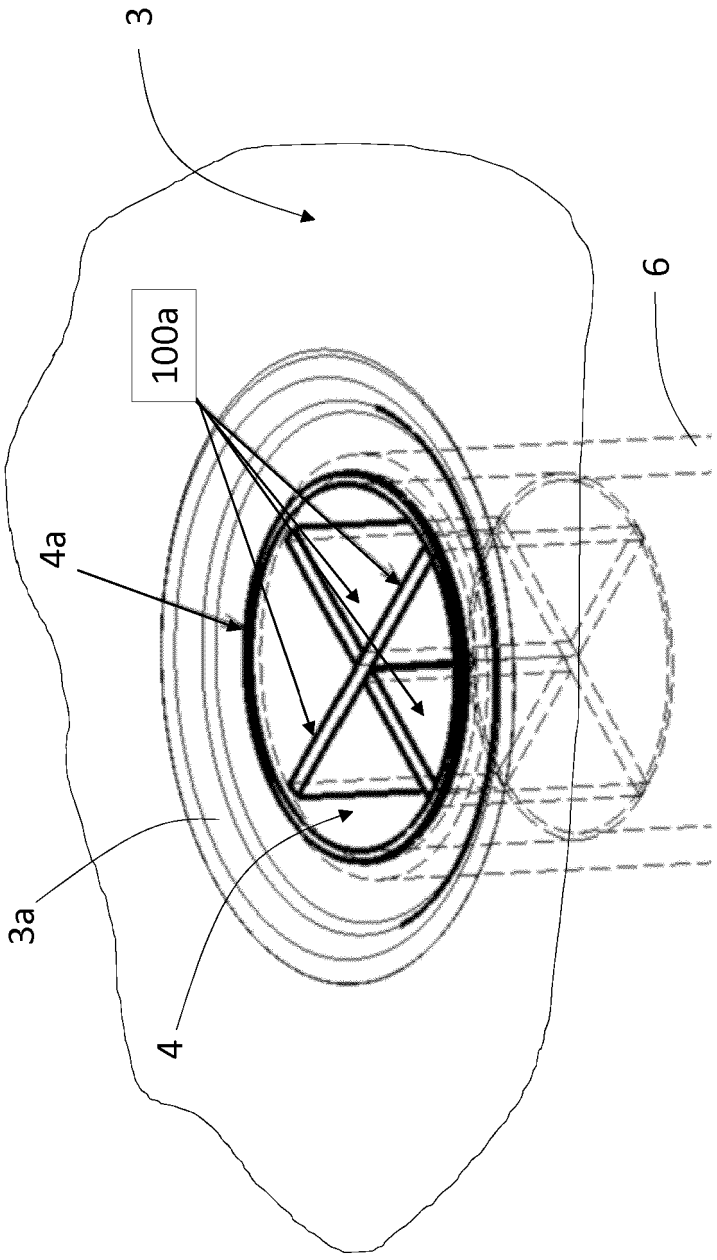

Fig. 7

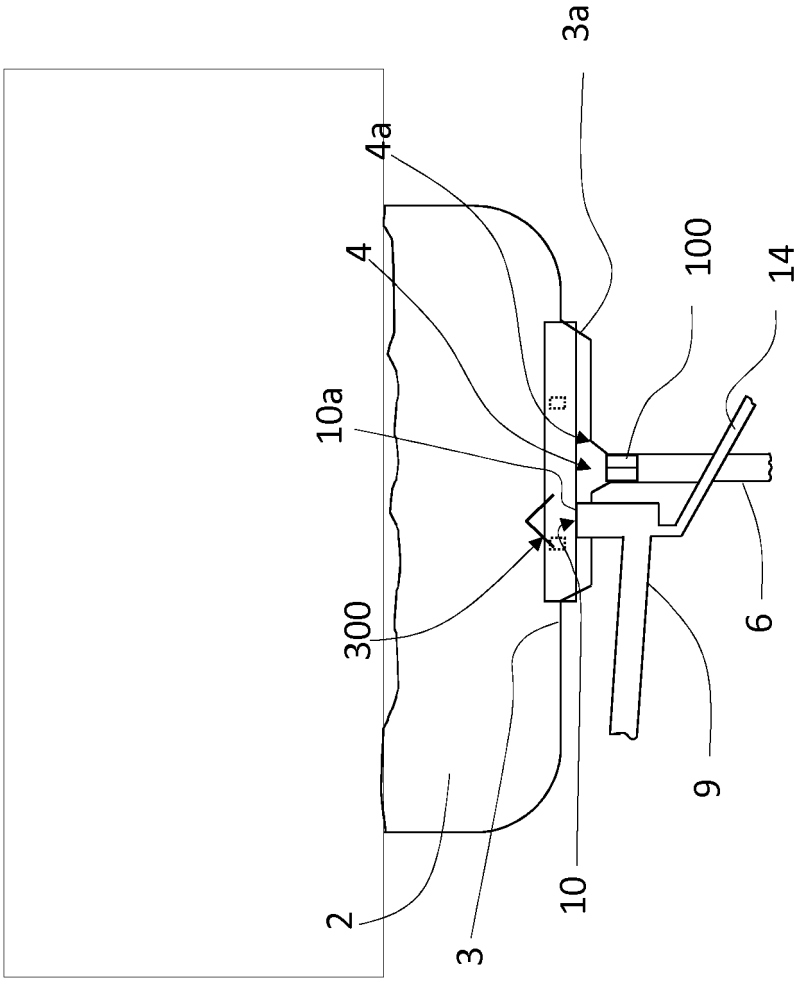

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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- WO 2015164239 A1 **[0014]**
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- WO 2018044171 A2 **[0016]**