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(71) Applicant: **MERLONI ELETTRODOMESTICI**
S.p.A.
I-60044 Fabriano (AN) (IT)

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(72) Inventor: **Quintini, Antonio**
Fabriano (AN) (IT)

(54) Oven for the food cooking with a chimney for the vapours discharge

(57) A domestic oven for the cooking of food is described, of the type comprising a cooking chamber (3), a fan (7) which is able to create a flow of fresh air and a discharge duct (22,24) for vapours and/or smoke (F) which are produced within said chamber (3) during the cooking; the main feature of the described cooking oven is that of comprising at least a cooling duct (25,26) being contiguous to said discharge duct (22,24), within which at least a part of the flow of fresh air (R1,R2) produced by said fan (7) is conveyed, in order to reduce the temperature of the vapours and/or smoke (F) which flow within said discharge duct (22,24).

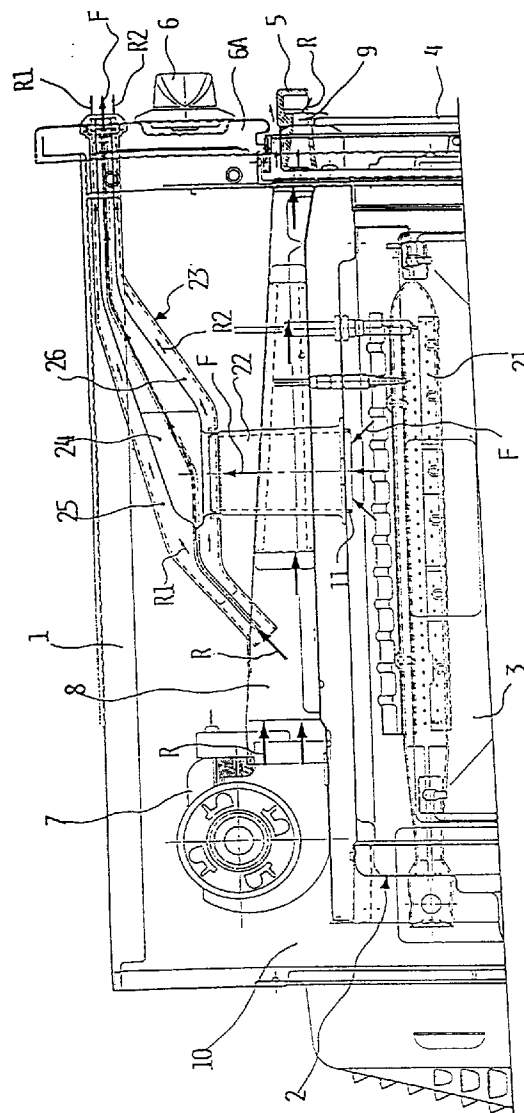


FIG. 3

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Description

The present invention refers to a domestic oven for the cooking of food, of the type comprising a cooking chamber, a fan which is able to create a flow of cooling air that passes through a duct being defined between said fan and the front part of the oven, and an outlet for the ejection from said chamber of the vapours produced therein during the cooking.

It is known that, during the cooking, food gives origin to vapours and/or smoke; such a fact is quite common also in domestic ovens, in which it is obviously necessary to expel such vapours from the cooking chamber where the food is heated; such problem is particularly felt in domestic ovens which operate with gas, wherein the vapours produced by food are added to the smoke eventually produced by the combustion of the same gas.

For this purpose, ovens are known, equipped with a discharge chimney for vapours, being generally realized by means of an opening being present in the upper wall of the cooking chamber.

It is also known that, in some solutions, ovens are equipped with a tangential fan, the rotation axis of which lays parallel to the rear wall of the cooking chamber; such fan is arranged above the muffle of the oven, in proximity of its rear wall; above the muffle a duct is also defined, through which the flow of air produced by the cited fan is made to exit in the front part of the oven, in order to cool the loading door and/or its handle and/or the command board of the oven.

In such ovens, the discharge chimney is placed in direct communication with the cited duct, whereupon the flow of cooling air is also utilized for favouring the ejection of vapours.

Such solution has some problems and drawbacks.

A typical first drawback is the presence of back pressures, in the zone of communication between the vapours discharge chimney and the cooling duct, whereupon the ejection of same vapours cannot result in being satisfactory and can negatively influence the operation of the oven and the quality of the cooking.

Another problem is due to fact that the outlet of the vapours chimney from the cooking chamber is relatively close to the front part of the oven: the cited vapours cannot fully mix with the cooling air, and can therefore exit being somewhat hot and/or saturated with humidity, with disturbing consequences for the surrounding ambient and for the front part or the handle of the oven.

Vapours that are expelled can therefore also be of very high temperature, whereupon the cooling function of the tangential fan is greatly reduced.

The aim of the present invention is that of solving the above cited problems and in particular of showing an oven for the cooking of food in which the ejection of vapours and/or smoke is realized in an effective, reliable, simple and economic way.

Such aim is reached according to invention by a domestic oven for the cooking of food having the charac-

terizing features of the annexed claim 1.

Further aims and advantages of the present invention will result in being clear from description that follows and from the annexed drawings, supplied purely as an explanatory and non-limiting example, wherein:

- figure 1 represents with a schematic section a cooking oven of a substantially known type;
- figure 2 represents with a schematic section an oven realized according to the present invention;
- figure 3 represents an enlarged part of the section of figure 2;
- figure 4 schematically represents with a front view the oven of figures 2 and 3.

In figure 1, a domestic cooking oven of the known type is represented, by means of a simplified section.

Such oven has a casing or cabinet 1 (that could also be a furniture component for the built-in of the oven) and a muffle 2, within which a cooking chamber 3 is defined; with 4 the door of such oven is shown, with 5 its opening handle, with 6 the commands which are on a dashboard 6A.

Above the muffle 2, in proximity of its rear wall, a tangential fan 7 is arranged; above the muffle 2 a cooling duct 8 is also defined, which extends between the delivery of the fan 7 and the front of the oven; the duct 8 ends in particular in correspondence of a series of louvers 9, being present in the door 4, in proximity of the handle 5.

The main suction zone of the fan 7 is constituted by the rear hollow, shown with 10, which extends between the muffle 2 and the casing 1, and which is in air-communication with the outside of the oven.

In the upper wall of the cooking chamber a chimney for the discharge of vapours is obtained, being realized by an opening 11 that places in communication the cooking chamber 3 with the cooling duct 8.

The operation of the oven of figure 1, having regards to the discharge of vapours, is the following.

Fan 7 sucks cold air from the hollow 10 and pushes it in the duct 8, until said air exits through louvers 9 in order to cool the handle 5, the door 4 and the dashboard 6A.

Vapours that are originated by the food in the cooking chamber 3 exit by way of the opening 11 and are pushed towards the outside by the flow of cooling air produced by fan 7.

The solution shown in figure 1, which allows to exploit the cooling fan 7 also for the ejection of vapours, has the problems cited in the opening of the present description.

In figure 2 a cooking oven according to the present invention is schematically represented in section; in such figure some of the reference numbers of figure 1 have been used, inasmuch as the useful components are

mostly the same.

In such figure, reference numbers 20 and 21 show respectively a lower heat source and an upper heat source, for the cooking chamber, which in the specific case are constituted by two gas burners; reference number 22 indicates a tubular element, being realized with a material which is able to resist high temperatures, for example sheet plate; the tubular element 22 is coupled to the discharge opening 11 and therefore it is part of a discharge chimney for vapours and/or smoke produced within the cooking chamber 3.

With reference number 23 a tubular body is shown, also being realized in sheet plate, in which three separate and distinguished conduits are defined, and more precisely a central conduit 24 and two peripheral conduits, an upper one indicated with 25 and a lower one indicated with 26; as it can be seen, also with reference to figures 3 and 4, the ducts 25 and 26 surround the duct 24.

As it can be noted, a first end of the central conduit 24 is coupled to the upper end of the tubular element 22, while its second end terminates towards the exterior, on the dashboard 6A, above the commands 6 of the oven.

It has to be specified that the tubular element 22 is not in communication with the cooling duct 8, while on the contrary an end of the peripheral conduits 25 and 26 is in communication with the cooling duct 8, in proximity of the delivery of the fan 7; the second end of the peripheral conduits 25 and 26 terminates in the same zone as the central duct 24, on the command board of the oven; in particular, as can be seen in figure 4, the outlet end of the two peripheral conduits 25 and 26 are arranged respectively above and below the outlet end of the central conduit 24.

The operation of the oven according to the invention is the following.

During the operation of the oven, vapours and/or smoke created within the cooking chamber 3 exit in a natural way through the opening 11, reach the conduit 24 through the tubular element 22, and then exit in the external ambient, through the opening being present on the dashboard 6A; the run of vapours and/or smoke is made evident in figure 3 by the use of arrows F.

In the meantime, fan 7 starts its operation, provides for sucking fresh air from the hollow 10 and pushes it in the cooling duct 8, until the louvers 9, as indicated by arrows R.

A part of such fresh air which is pushed in the cooling duct 8 also penetrates the inlet end of conduits 25 and 26, which are suitably shaped to this purpose, for then exiting on the dashboard 6A, as indicated by arrows R1 and R2.

It has been verified in practice that the oven realized according to the present invention allows for avoiding the typical drawbacks of the known prior art.

In particular, as can be imagined, in the above described embodiment smoke F that exits the cooking chamber 3 through the tubular element 22 and the cen-

tral conduit, is cooled in a substantial way by virtue of the flows of fresh air R1 and R2, that run within the conduits 25 and 26 and that are also mixed in exiting with the smoke leaving the central conduit 24: thus, vapours and/or cooking smoke exit the outlet louver of the conduit 24 at a reduced temperature, without risks to the user and the oven; such cooling function is furthermore made easier by the thermal exchange which occurs between conduits 24 and 25-26.

Furthermore, the particular arrangement of the outside outlets of conduits 24, 25 and 26 avoids the creation of the homogenous flow which is typical in the known prior art; in fact, such arrangement allows to obtain an optimal air turbulence in the front zone of the oven, which assures both the dilution and the dispersion of vapours and smoke; also the cooling of the dashboard 6A, of the handle 5 and of the door 4 is improved, because they are invested by air which is really fresh.

From the given description the characteristics and advantages of the cooking oven according to the present invention are therefore clear.

It is clear that several changes are possible for the oven described as example, without departing from the novelty principles of the inventive idea.

For instance, it is cited the possibility of equipping the oven with a net filter or an activated carbon filter, which is for example inserted, in a removable manner, in the duct 24, with the aim of withholding the larger impurities eventually being present in the vapours and/or smoke; such filter could for example be placed in the exit zone of the conduit 24, in order to make its access easier. This solution would allow to reduce even more the typical yellowing which normally takes place in the zone by which the vapours of the oven exit.

In a particularly advantageous embodiment, the tubular element 22 can be arranged to cross the cooling duct 8, in order that, besides the cooling effect of conduits 25 and 26, the tubular element 22 is also invested by the fresh air R flowing in the cooling duct 8, with a preliminary lowering of the smoke temperature; the main function of the fan 7 and the duct 8, i.e. of cooling the front zone of the oven, is in any case assured, in a way that is clearly better if compared to ovens according to the known art, of the type being illustrated in figure 1, because said cooling function is obtained with fresh air which is not influenced by a temperature raising due to its mixing with the smoke which exits the cooking chamber.

Another possible change is that of providing, in the inside of the body 23, walls or baffles, for creating obliged runs for air and vapours and/or smoke.

In a further embodiment, the body 23 could be provided with a different number of cooling conduits, for vapours and/or for the fresh air; for example, two discharge conduits and four cooling conduits could be provided, or a single discharge conduit being surrounded by a single cooling conduit.

Another change is that of providing, in the exit zone

towards the outside of conduits 24, 25 and 26, baffles which direct in a suitable way the air and/or vapours flows, in order to assure a turbulence which is able to realize the dilution and dispersion of vapours and smoke, and the cooling of the dashboard of the oven.

A further change could be that of utilizing, in a way in itself known, a part of the really fresh air which comes from fan 7 for the cooling of the door 4, that could provide a cooling hollow for this purpose, between its two glasses.

It is however clear that several other changes can be made by the skilled man to the oven for the cooking of food being the subject of the present invention, as it is also clear that in the practical embodiment of the invention, shapes and sizes of the components could be different, and the same could be realized by elements being technically equivalent.

Claims

1. Domestic oven for the cooking of food, of the type comprising a cooking chamber (3), a fan (7) which is able to create a flow of fresh air and a discharge duct (22,24) for vapours and/or smoke (F) which are produced within said chamber (3) during the cooking, characterized in that it comprises at least a cooling duct (25,26) being contiguous to said discharge duct (22,24), within which at least a part of the flow of fresh air (R1,R2) produced by said fan (7) is conveyed, in order to reduce the temperature of said vapours and/or smoke (F) which flow within said discharge duct (22,24).
2. Domestic oven for the cooking of food, according to claim 1, characterized in that the vapours and/or smoke outlet of said discharge duct (22,24) and the air outlet of said cooling duct (25,26) are contiguous.
3. Domestic oven for the cooking of food, according to claim 1, characterized in that the vapours and/or smoke inlet of said discharge duct (22,24) and the air inlet of said cooling duct (25,26) are distanced.
4. Domestic oven for the cooking of food, according to claim 1 or 2, characterized in that said discharge duct comprises at least a first dedicated tubular element (22-24).
5. Domestic oven for the cooking of food, according to claim 1 or 2, characterized in that said cooling duct includes at least a second dedicated tubular element (25,26).
6. Domestic oven for the cooking of food, according to claims 3 and 4, characterized in that said first tubular element (22-24) and said second tubular element (25,26) are part of a single body (23), being in par-

ticular realized with a material which is able to withstand high temperatures, such as the sheet plate.

7. Domestic oven for the cooking of food, according to claim 1, characterized in that a second cooling duct (8) is provided, which extends between said fan (7) and the front part (9) of the oven, for the cooling of the latter, and that said fan (7) is able to create a flow of fresh air for both said cooling ducts (25,26; 8).
8. Domestic oven for the cooking of food, according to the previous claim, characterized in that said discharge duct (22,24) for vapours and/or cooking smoke crosses, in particular in its initial portion, said second cooling duct (8) for the front zone of the oven, in such a way that the flow of fresh air (R) that flows within said second cooling duct (8) is able to produce an initial cooling of the temperature of vapours and/or smoke (F) which flow within said discharge duct (22,24).
9. Oven, according to at least one of the previous claims, characterized in that said fan (7) is of the tangential type, with a rotation axis arranged parallel to the rear wall of said cooking chamber (3).
10. Oven, according to at least one of the previous claims, characterized in that within said discharge duct (22,24) a filtering element is inserted, in particular a net filter or an activated carbon filter.
11. Oven, according to at least one of the previous claims, characterized in that walls or baffles are provided in the inside of said vapours and/or smoke cooling duct (25,26), in order to create obliged runs for the air (R1,R2) and/or the vapours and/or the smoke.
12. Oven, according to at least one of the previous claims, characterized in that in the exit zone towards the ambient of said cooling and/or discharge ducts (25,26; 22,24) baffles are present, in order to suitably direct the flows of air (R1,R2) and of vapours and/or smoke (F).
13. Oven, according to at least one of the previous claims, characterized in that two or more discharge ducts (22,24) are provided, to each of them being contiguous at least a cooling duct (25,26).
14. Method for the expulsion of cooking smoke and/or vapours from a domestic oven, characterized by the following steps:
 - smoke and/or vapours produced within a cooking chamber are conveyed into a discharge duct (22,24), being in communication between said chamber (3) and the external ambient;

- fresh air (R1,R2) is drawn and conveyed into one or more cooling ducts (25,26) being contiguous to said discharge duct (22,24) but not in substantial communication with it;
- smoke and/or vapours (F) and the fresh air (R1,R2) are expelled substantially by the same zone of the oven, in particular the front one.

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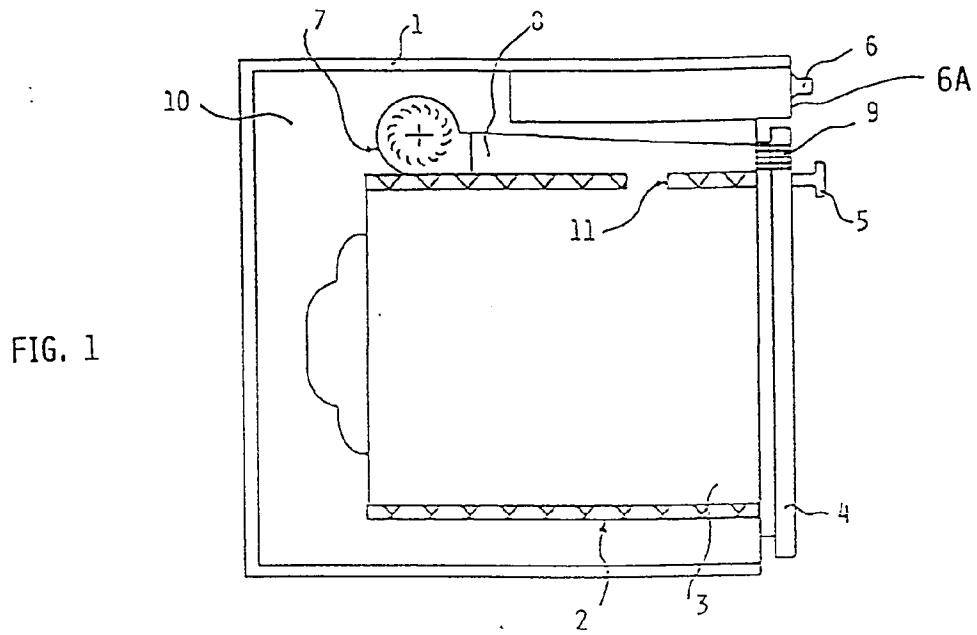


FIG. 2

