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(54) MUFFLE FOR CONVECTION OVEN AND OVEN COMPRISING SAID MUFFLE

(57) A muffle comprises a back (1) provided with a central zone (3) capable to accommodate at least a resistance, a motor and an impeller, said back (1) presenting a substantially parabolic profile in the part between its external perimeter and said central zone (3), with radii (4) between the portions (5) with horizontal inclination and the portions (6) with vertical inclination.

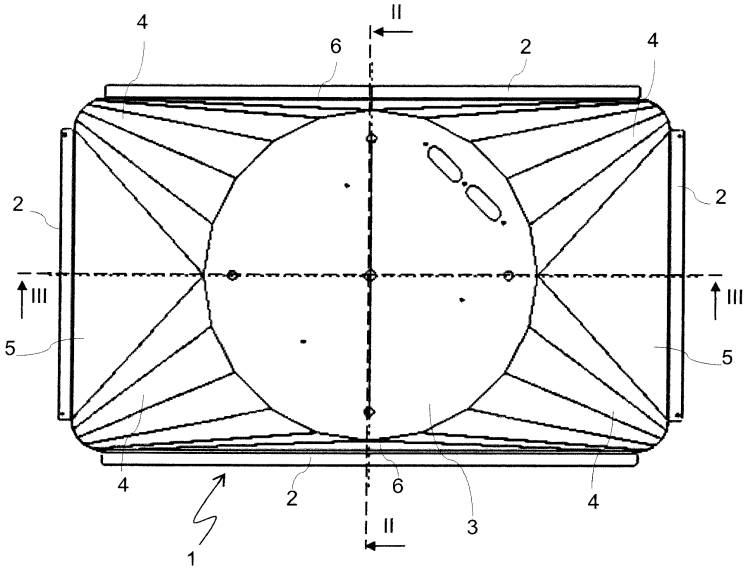

Fig.1

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Description

[0001] This invention concerns convection ovens for cooking food or semi-finished food products, and in particular a muffle with a back having a parabolic profile. In the following, specific reference will be made to an electric convection oven, but it is clear that what is being said can be applied to other types of oven (e.g. gas oven) in which there is a circulation of hot air, possibly also for the heat treatment of non-food products.

[0002] It is well known that the term "muffle" usually indicates the inner chamber of a food oven and the like, suitable for receiving food to be heated or cooked, and there are currently known and widespread muffles consisting of two parts substantially in the shape of a C whose respective concavities are turned towards each other, so as to form a cooking chamber that is closed at the rear by a back and at the front by a door used for the insertion and removal of food.

[0003] The two C-shaped parts are connected to each other and to the back by means of corresponding peripheral flaps, which are coupled through connecting means generally consisting of continuous welding, spot welding or fastening elements such as screws, rivets and the like, possibly with the interposition of appropriate gaskets. Examples of this type of muffle are described in EP 1655544 and ES 2332555, among others.

[0004] A drawback of these traditional muffles is that they do not allow a good circulation of hot air flows due to the flat shape of the back that causes pressure losses and unproductive swirls, therefore this shape is not optimal to circulate the air efficiently inside the cooking chamber. As a result, the cooking time and therefore the energy consumption of the oven are rather high, and the cooking is not perfectly uniform because the hot air is not evenly distributed inside the cooking chamber.

[0005] The purpose of this invention is therefore to provide a muffle that is free from said drawbacks. This object is achieved with a muffle equipped with a back having a substantially parabolic profile in the area of air circulation.

[0006] A first important advantage of this muffle is that it considerably improves the circulation of air flows, so that cooking is faster and more uniform, saving time and energy.

[0007] A second notable advantage of this muffle resides in the fact that the greater efficiency of the heating system allows to reduce the use of motors, impellers and resistances that generate and diffuse the hot air, thus obtaining, with the same performance, a considerable economic saving both in the production phase and in the maintenance of the oven.

[0008] Further advantages and characteristics of the muffle according to the present invention will be evident to those skilled in the art from the following detailed description of an embodiment thereof with reference to the annexed drawings, in which:

Fig.1 is a front view of the back of the aforesaid muffle;

Fig.2 is a sectional view of the back along the vertical symmetry plane II-II of Fig.1; and

Fig.3 is a sectional view of the back along the horizontal symmetry plane III-III of Fig.1.

[0009] The attached figures show an exemplifying embodiment of a muffle according to the present invention constituted by two parts substantially in the shape of C whose respective concavities are facing each other, not shown but like those of the above-mentioned prior art, so as to form a cooking chamber that is closed at the rear by a back 1 and at the front by a door (not shown) used for the insertion and the removal of the food. The back 1 is connected to the two C-shaped parts by means of peripheral flaps 2 which are coupled through known connecting means to corresponding flaps present on said two parts.

[0010] The novel aspect of the present muffle lies in the shape of back 1 that has a substantially parabolic profile in the part between the outer perimeter and the central circular zone 3, where at least one heating element and a motor that drives a impeller are fixed, so as to circulate the hot air inside the oven. This parabolic profile of back 1 can be obtained by deep drawing from a mould or folding press and subsequent welding of the parts, in any case providing for radii 4 between portions 5 with horizontal inclination and portions 6 with vertical inclination, in order to minimize pressure losses.

[0011] In the example shown, portions 5 have an inclination of $51° \pm 10\%$ in correspondence of the horizontal symmetry plane III-III (Fig.3), while portions 6 have an inclination of $6° \pm 10\%$ in correspondence of the vertical symmetry plane II-II (Fig.2). The inclination is intended as the angle formed by the line that connects the peripheral edge of back 1, where flaps 2 are formed, to the edge of the central flat part 3 where the active elements of the oven (resistance, motor, impeller) are fixed.

[0012] However, it is clear that these values can be modified according to specific construction requirements depending on the shape and size of the muffle, therefore the value of these angles is purely indicative of a specific embodiment that is susceptible to many variations, in addition to those already mentioned above. For example, the central zone 3 could have a different shape instead of a circular one and could accommodate a variable number of resistances and/or motors and/or impellers. Furthermore, the connection between back 1 and the other parts of the muffle could be made by different means that do not require the presence of flaps 2.

[0013] Finally, although the illustrated shape of back 1 with double symmetry is the preferable one, specific construction and/or encumbrance requirements could lead to a shape with only one vertical or horizontal symmetry or even no symmetry, and the angles and radii would be adapted to such specific shapes according to the normal knowledge of a person skilled in the art.

Claims

1. Muffle comprising a plurality of parts connected to form a cooking chamber, said plurality of parts comprising a back (1) provided with a central zone (3) capable of accommodating at least a resistance, a motor and an impeller, **characterized in that** said back (1) has a substantially parabolic profile in the part between its external perimeter and said central zone (3), with radii (4) between the portions (5) with horizontal inclination and the portions (6) with vertical inclination that form said part between the external perimeter and the central zone (3).

2. Muffle according to claim 1, **characterized in that** the back (1) has a plane of vertical symmetry and a plane of horizontal symmetry.

3. Muffle according to claim 2, **characterized in that** the portions (5) with horizontal inclination have an inclination of 51°±10% in correspondence with the plane of horizontal symmetry and the portions (6) with vertical inclination have an inclination of 6°±10% in correspondence with the plane of vertical symmetry.

4. Muffle according to any of the previous claims, **characterized in that** the back (1) is provided with peripheral flaps (2) suitable to be coupled to corresponding peripheral flaps present on the parts of the muffle adjacent to the back (1).

5. Oven **characterized in that** it includes a muffle according to any of the previous claims.

6. Method for the production of a muffle according to any of claims 1 to 4, **characterized in that** the substantially parabolic profile of the back (1) is obtained by deep drawing from a mould or folding press and subsequent welding of the parts.

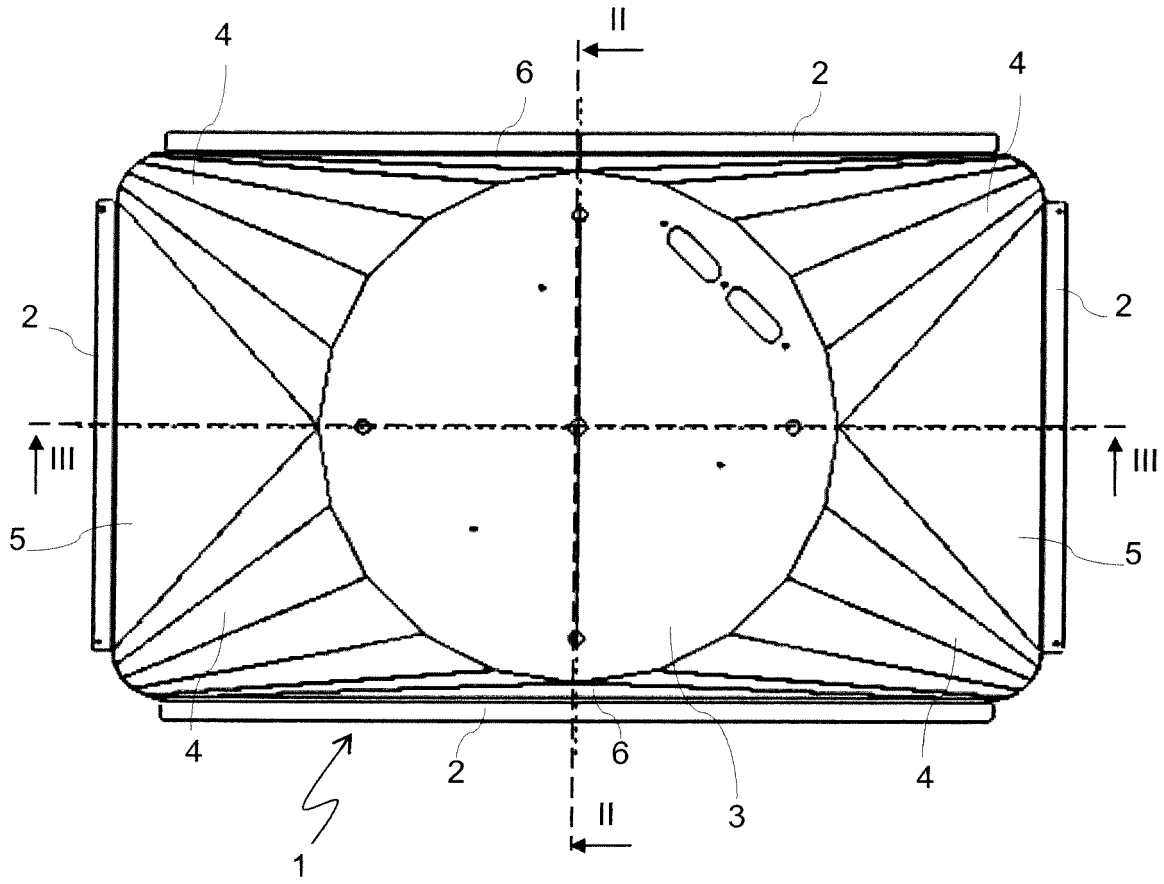

Fig.1

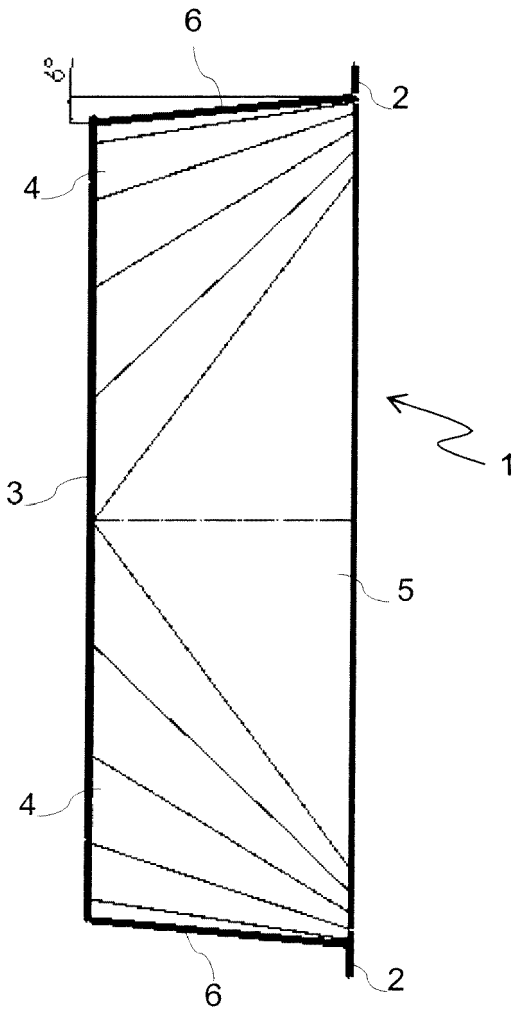

Fig.2

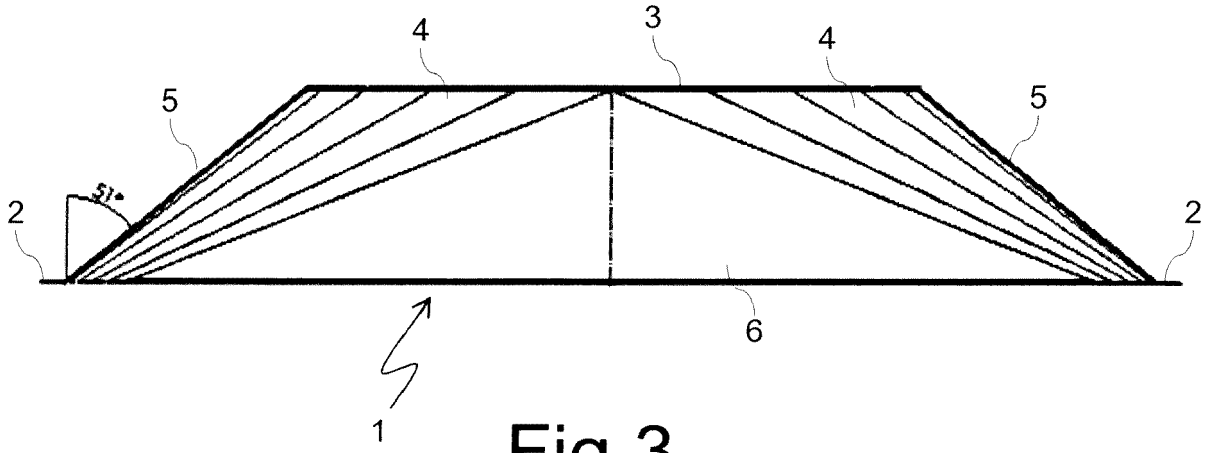

Fig.3

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EUROPEAN SEARCH REPORT

Application Number
EP 18 42 5068

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 2 781 840 A1 (FAGORBRANDT SAS [FR]) 24 September 2014 (2014-09-24) * claim 11; figure 7 *	1-5 6	INV. F24C15/08
Y	EP 1 186 835 A1 (ELOMA GMBH GROSSKUECHENTECHNIK [DE]) 13 March 2002 (2002-03-13) * claims 1,4; figure 1 *	6	
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A	EP 2 392 238 A1 (FAGOR S COOP [ES]) 7 December 2011 (2011-12-07) * figures 3,4 *	1-6	
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			TECHNICAL FIELDS SEARCHED (IPC) F24C H05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 April 2019	Adant, Vincent

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 42 5068

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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04-04-2019

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- ES 2332555 **[0003]**