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(54) **KITCHEN OVEN AND COOKING RANGE**

(57) The present invention refers to an oven (1) for cooking/heating up miscellaneous foods. Said oven (1) has at least one internal cavity (2) with a set of walls (3, 4, 5, 6, 7) and at least one wall of the internal cavity (2) comprises carbon steel coated by an alloy made of Zinc,

Aluminum and Silicon.

The present invention also refers to a kitchen oven that comprises a set of burners and at least one domestic oven (1) as described above, and the domestic oven (1) is disposed under said set of burners.

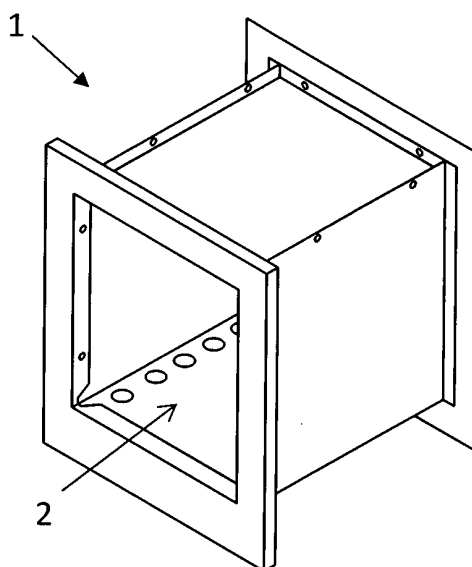


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention refers to an oven and, more specifically, a domestic oven for cooking/heating up miscellaneous foods.

[0002] The present invention also refers to a kitchen oven that comprises the aforementioned oven.

BACKGROUND OF THE INVENTION

[0003] Ovens are domestic and industrial utensils that are rather well-known and essential for preparing food. Individual ovens, i.e. those in which there is just the cooking cavity, are known, as are ovens that are part of kitchen ovens, having one or more burners that are combined with an oven, the latter generally disposed underneath the kitchen oven top.

[0004] An oven's cooking cavity, in turn, generally comprises a parallelepipedal format with five fixed walls, one of the sides having a removable wall, such as a door, through which it is possible to gain access to the inside of the cavity. The walls may also comprise a thermal coating in order to prevent dissipation of the heat generated inside the cavity, as well as an opening to remove the gas and heat generated in the cavity, in order to offset the internal temperature and pressure.

[0005] In the same way, different sources of radiation may be used to generate heat inside the oven cavity or directly in the food, such as but not limited to burning gas, use of electrical resistance, generating microwaves, hot steam, etc. Also, more than one source of heat may be associated in the same oven, such as a combination of a gas oven with electrical resistance, a microwave oven with electrical resistance, etc.

[0006] The domestic kitchen ovens for cooking food known in the state of the art comprise a set of burners at the top and at least one oven underneath said burners.

[0007] It is known that the material used in the oven's internal cavity directly influences its durability and performance, mainly with regard to corrosion resistance, thermal reflectivity and consumption, which is directly influenced by the oven's operating efficiency.

[0008] In particular, the internal cavity of currently known ovens is normally built from steel, which has an enameled coating in order to prevent corrosion. Generally speaking, the upper wall (top) and the lower wall (base) of the oven's internal cavity are coated with an enamel with a smooth texture that is easy to clean, preferably of the smooth vitrified type, also known as "easy clean". Moreover, the side walls of the oven's internal cavity normally have an enameled coating with a rough, porous surface, which is capable of absorbing grease so as to dispense with the need for cleaning.

[0009] That kind of coating is consequently also known as "self-cleaning". One should note that the rear wall (back) may be of both the "easy clean" type and also of

the "self-cleaning" type, depending on the oven's type and application.

[0010] However, in spite of the fact that these known coatings provide the oven with functional and aesthetic benefits, they require an additional stage in the production process, enameling, which raises the oven's manufacturing costs, which is obviously undesirable.

[0011] There is thus a need for a technical solution for ovens' internal cavities, which is capable of simultaneously providing durability, performance and low production cost.

OBJECTIVES AND DESCRIPTION OF THE INVENTION

[0012] Therefore, one objective of the present invention is to provide an oven for cooking/heating food that is capable of eliminating or at least reducing the limitations of known technologies in the state of the art.

[0013] In addition, a further objective of this present invention is to provide a domestic oven, in particular for cooking/heating up food, which presents enhanced resistance to corrosion at high temperatures compared with ovens known in the state of the art.

[0014] Another objective of the present invention consists of providing a domestic oven, in particular for cooking/heating up food, which presents an enhanced thermal reflectivity index compared with ovens known in the state of the art.

[0015] Moreover, another objective of the present invention consists of providing a domestic oven, in particular for cooking/heating up food, which presents more efficient operation, so as to provide lower gas consumption compared with ovens known in the state of the art.

[0016] It is also an objective of the present invention to provide a domestic oven, in particular for cooking/heating up food, with a construction layout that dispenses with the enameling stage on at least one wall of the internal cavity, allowing the reduction of at least one of the stages of production and, consequently, a reduction in production costs.

[0017] Lastly, it is also an objective of the present invention to provide a kitchen oven that comprises the aforementioned oven.

[0018] One or more of the aforementioned objectives of the present invention, among others, is/are achieved through an oven with at least one internal cavity provided with a set of walls, at least one wall of the internal cavity comprising carbon steel coated by an alloy made of Zinc, Aluminum and Silicon.

[0019] In accordance with additional or alternative embodiments of the oven of the present invention, it may also comprise the following characteristics, alone or in combination:

- the set of walls comprises an upper wall, a lower wall, a rear wall and side walls;
- the wall of the internal cavity that comprises carbon

steel coated by said alloy made of Zinc, Aluminum and Silicon is the upper wall;

- said alloy comprises between 35% and 50% of Zinc;
- said alloy comprises between 50% and 60% of Aluminum;
- said alloy comprises between 1% and 2% of Silicon;
- said alloy comprises between 35% and 50% of Zinc, between 50% and 60% of Aluminum and between 1% and 2% of Silicon;
- said alloy comprises 43.5% of Zinc, 55% of Aluminum and 1.5% of Silicon.

[0020] This present invention also refers to a kitchen oven that comprises a set of burners and at least one oven as described above, the oven being disposed under said set of burners.

BRIEF DESCRIPTION OF THE FIGURES

[0021] The objectives, technical effects and advantages of the object of the present invention will be apparent to persons skilled in the art from the detailed description below, which refers to the attached figures, which illustrate example embodiments of the present invention that are not limiting.

- Figure 1 is perspective view of a domestic oven in accordance with a particular embodiment of the present invention; and
- Figure 2 is an exploded view of the domestic oven shown in figure 1.

DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[0022] Initially, it must be pointed out domestic oven 1, object of the present invention, will be described below in accordance with particular, but not limiting, embodiments, since their specific features may be embodied in different forms and variations in accordance with the desired application. It is also worth pointing out that domestic oven 1, with a particular shape, is designed for use in homes.

[0023] As one can see in figures 1 and 2, which illustrate a particular embodiment of the present invention, oven 1, as a domestic oven, comprises at least one internal cavity 2 capable of accommodating miscellaneous foods during the process of cooking/heating up. This internal cavity 2 of oven 1 has a set of walls 3, 4, 5, 6, 7 that comprises an upper wall 3, a lower wall 4, a rear wall 5 and side walls 6, 7, at least one of these walls of the internal cavity 2 comprising carbon steel coated by an alloy made of Zinc, Aluminum and Silicon.

[0024] In particular, the wall of the internal cavity 2 which comprises carbon steel coated by the alloy of Zinc, Aluminum and Silicon is the upper wall 3. Alternatively, any of the walls in the set of walls 3, 4, 5, 6, 7 may, separately or in combination, comprise carbon steel coat-

ed by the alloy of Zinc, Aluminum and Silicon.

[0025] In a more particular manner, said alloy comprises between 35% and 50% of Zinc and/or between 50% and 60% of Aluminum and/or between 1% and 2% of Silicon. More specifically, said alloy comprises 43.5% of Zinc, 55% of Aluminum and 1.5% of Silicon.

[0026] It is worth noting that the carbon steel coated by the alloy of Zinc, Aluminum and Silicon, in particular in the aforementioned proportions, provides the internal cavity 2 of the domestic oven 1 with enhanced corrosion resistance at high temperatures, an enhanced thermal reflectivity index and greater operating efficiency (lower gas consumption) compared to domestic ovens known in the state of the art.

[0027] In addition, the construction layout of domestic oven 1 of the present invention also dispenses with the enameling stage for at least one wall in its internal cavity 2, which allows it to lower production costs.

[0028] The proposed technical solution thus provides domestic oven 1 with durability, performance and low production cost.

[0029] A further object of the present invention is a kitchen oven comprising a set of burners and at least one domestic oven 1 as described above, the domestic oven 1 being disposed under said set of burners.

[0030] In spite of the description of the above specific embodiments referring to certain specific features, the domestic oven and kitchen oven of the present invention may be embodied in different manners and may present modifications to the manner of their implementation, such that the extent of the invention's protection is limited solely by the wording of the attached claims, including all possible equivalent variations.

Claims

1. OVEN (1), having a least one internal cavity (2) provided with a set of walls (3, 4, 5, 6, 7), **characterized in that** at least one wall of the internal cavity (2) comprises carbon steel coated by an alloy made of Zinc, Aluminum and Silicon.
2. OVEN (1), as claimed in claim 1, **characterized in that** the set of walls (3, 4, 5, 6, 7) comprises an upper wall (3), a lower wall (4), a rear wall (5) and side walls (6, 7).
3. OVEN (1), as claimed in claim 1 or 2, **characterized in that** the wall of the internal cavity (2) which comprises carbon steel coated by said alloy made of Zinc, Aluminum and Silicon is the upper wall (3).
4. OVEN (1), as claimed in any of claims 1 to 3, **characterized in that** said alloy comprises between 35% and 50% of Zinc.
5. OVEN (1), as claimed in any of claims 1 to 3, **char-**

acterized in that said alloy comprises between 50% and 60% of Aluminum.

6. OVEN (1), as claimed in any of claims 1 to 3, **characterized in that** said alloy comprises between 1% and 2% of Silicon. 5
7. OVEN (1), as claimed in any of claims 1 to 3, **characterized in that** said alloy comprises between 35% and 50% of Zinc, between 50% and 60% of Aluminum and between 1% and 2% of Silicon. 10
8. OVEN (1), as claimed in any of claims 1 to 3, **characterized in that** said alloy comprises 43.5% of Zinc, 55% of Aluminum and 1.5% of Silicon. 15
9. KITCHEN OVEN, comprising a set of burners, **characterized in that** it comprises at least one oven (1) as defined in any of claims 1 to 8, the domestic oven (1) being disposed on said set of burners. 20

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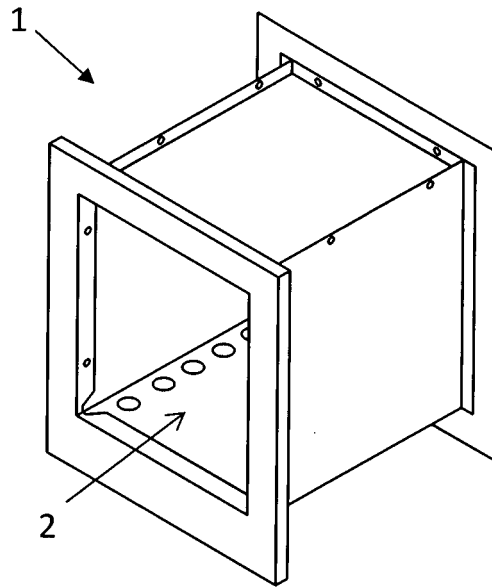


Fig. 1

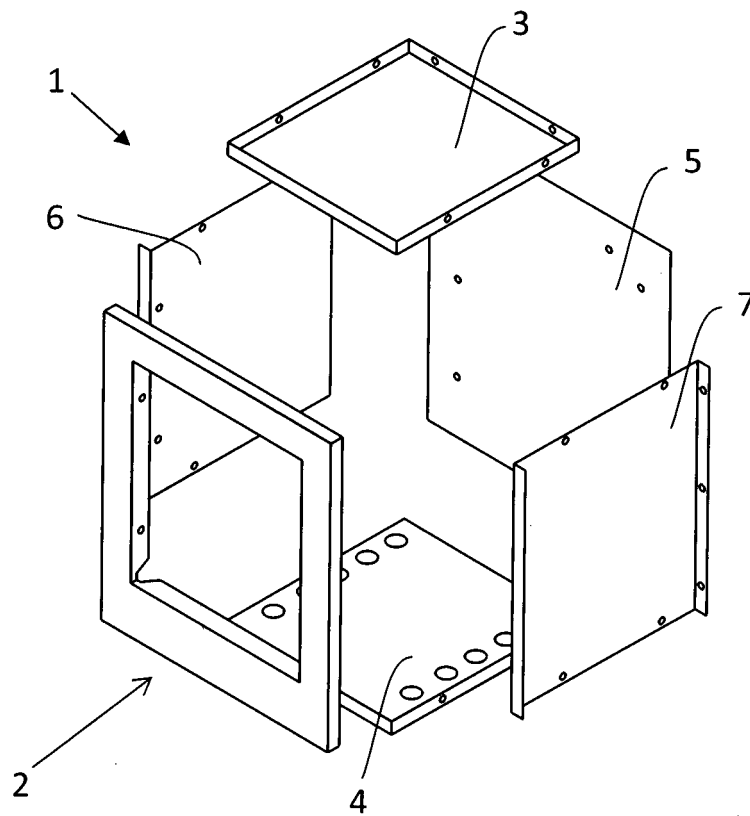


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No

PCT/BR2013/000120

A. CLASSIFICATION OF SUBJECT MATTER

INV. F24C15/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP H11 83027 A (SHARP KK; OKITSUMO KK) 26 March 1999 (1999-03-26) paragraph [0033]; figure 1 -----	1-8
A	Galvinfocenter: "galvalume coated steel sheet", online, 31 August 2003 (2003-08-31), XP055074101, Retrieved from the Internet: URL: http://www.steelmillsoftheworld.com/activities/datacenter/G_Note12.pdf [retrieved on 2013-08-05] the whole document ----- -/--	1

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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13/08/2013

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/BR2013/000120

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Unknown: "coated sheet", online, 2 February 2012 (2012-02-02), XP055074105, Retrieved from the Internet: URL:www.ussteel.com [retrieved on 2013-08-05] the whole document	1
X	----- JP H07 8387 A (SHARP KK; OKITSUMO KK) 13 January 1995 (1995-01-13) paragraph [0040]; figure 4 -----	1-9

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BR2013/000120

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP H1183027 A	26-03-1999	NONE	
JP H078387 A	13-01-1995	JP H078387 A	13-01-1995
		JP 2934122 B2	16-08-1999