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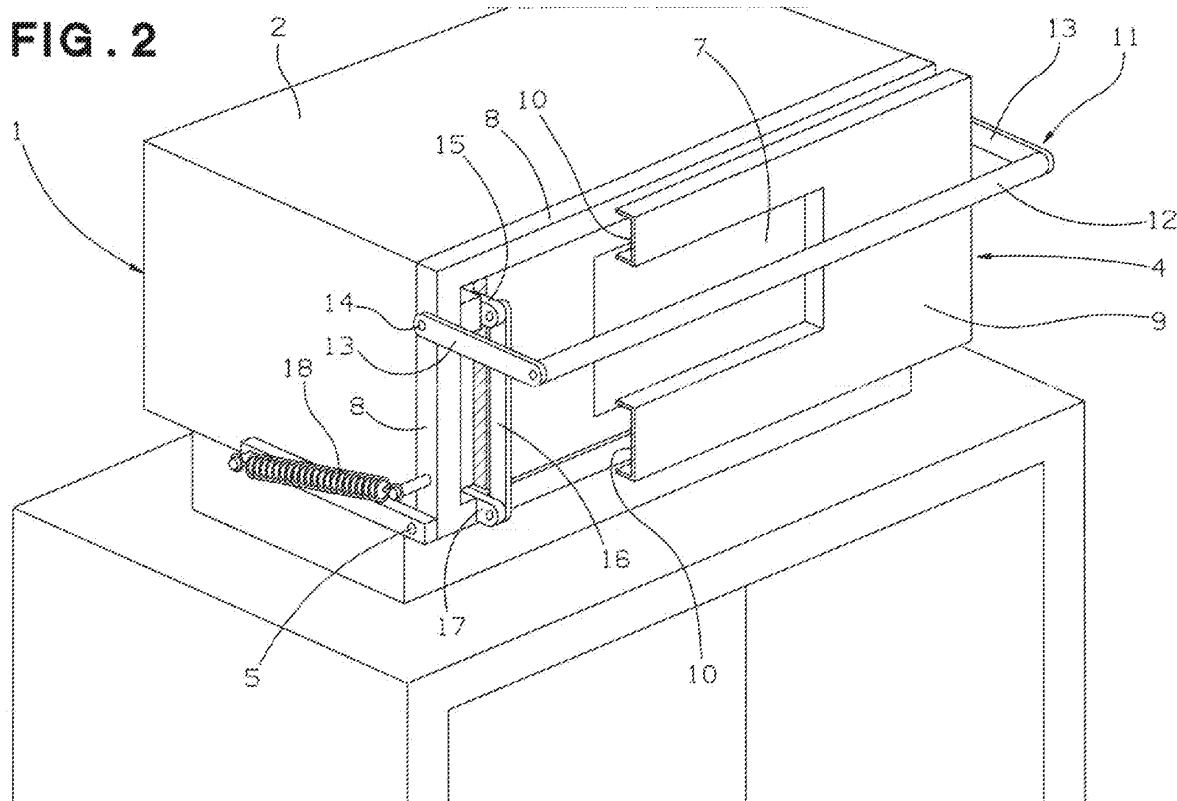
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(54) **Ergonomic and accident-prevention structure of door for professional food cooking ovens**

(57) Ergonomic and accident-prevention structure of door for professional ovens for cooking food, comprising a handle (11) with bar (12) pivoting about an axis (14) parallel thereto, suitable for positioning in any case be-

fore the door (4) from an inclination facing the closed door (4) plane to an inclination substantially coplanar to the open door (4) plane through coupling linkages (15, 16, 17) to the fulcrum (5) of the door (4) developing within an air space (10) arranged into the door (4) itself.



Description

Field of the invention

[0001] In the professional use of cooking ovens, that is, in pizza houses, restaurants and the like, opening and closing the relevant doors for putting into the oven, taking out of the oven and checking the food cooking, is an operation carried out a very large number of times during the working day, with the consequence that on the one hand, the relative actuating movement may cause soreness or even traumas to the user and, on the other hand, the very frequent occurrence of the operation, takes the operator away from precautions and cautiousness, so that the lack of attention may lead to accidents of burns due to contact with the door surface.

Objects of the invention

[0002] The main object of the present invention therefore, within the scope described above, is to provide an innovative handle structure, of the type for food ovens, which should allow meeting the requirements of professional operators for very frequent use, while favouring a relative use as little traumatic as possible for the user and also suitable for preventing accidental interferences with the door and thereby, above all, burns of the operator him/herself.

[0003] Another object of the present invention is to achieve the above objects through an innovation concept that should not subvert the usual working systems of professional catering operators and should be adaptable to the existing structures.

[0004] Yet another object of the present invention is to achieve the above objects through a simple and effective innovation concept, with safe operation and at a relatively low cost in consideration of the results achieved thereby in the practice.

Summary of the invention

[0005] These and other objects are all achieved by the ergonomic and accident-prevention structure of the door for professional ovens for cooking food, according to the present invention, comprising a handle (11) with bar (12) pivoting about an axis (14) parallel thereto, suitable for positioning in any case before the door (4) from an inclination facing the closed door (4) plane to an inclination substantially coplanar to the open door (4) plane through coupling linkages (15, 16, 17) to the fulcrum (5) of the door (4) developing within an air space (10) arranged into the door (4) itself.

Brief description of the drawings

[0006] Further features and advantages of the door structure, of the type for professional ovens for cooking food, according to the present invention, will appear more

clearly from the following detailed description of a preferred but non-exclusive embodiment thereof, illustrated by way of a non-limiting example in the annexed three drawings, wherein:

Figure 1 shows a perspective view of a professional oven for cooking food schematically illustrated as comprising the door structure according to the present invention in the relevant closed position; Figure 2 shows the same as in figure 1 in a perspective view with some cutaway portions; Figure 3 shows a perspective view of a professional oven for cooking food schematically illustrated as comprising the door structure according to the present invention in the relevant open position.

Static description of the preferred embodiment

[0007] With reference to such figures, and in particular to figure 1, reference numeral 1 globally indicates a professional oven for food schematically illustrated, for example of the specific type for pizza houses, in any case heated in a known manner, comprising a parallelepiped-shaped insulated enclosure 2, enclosing a baking chamber 3, which is accessed through a rectangular door globally indicated with reference numeral 4 with horizontal lowering opening direction through fixed fulcrum pins 5, distally coaxial in geometrical correspondence of the relevant lower side.

[0008] Door 4 is comprised of a shutter plate 6, with median window 7, reinforced by an external frame 8 projecting outwards and coated by a shaped coating 9, which hides said frame 8 and arranged therein defines an interspace or air space 10, therein including the area of window 7, to this end made by interfacing two glasses, one associated to the shutter plate 6 and the other associated to coating 9.

[0009] Door 4 is provided with a handle globally indicated with reference numeral 11, comprised of a horizontal holding bar 12, extending by the entire width of door 4 itself, associated thereto at the apex by two pivoting arms 13, integral to the relative fulcrum pins 14; said fulcrum pin 14 of the pivoting arms 13 pass through the respective top portions of the uprights of frame 8 and on the other side thereof they are also integral to respective upper levers 15, twinned through respective tie rods 16 to respective lower levers 17, integral to the fixed fulcrum pins 5 of door 4, kept into closed and open position by at least one side spring 18, for the functions specified hereinafter.

Dynamic description of the preferred embodiment

[0010] Having thus completed the static description of a preferred example of embodiment of the baking chamber structure according to the present finding, the dynamic one, or the relevant operation thereof, is provided below:

when door 4 is in closed position of the baking chamber 3, bar 12 of handle 11 exhibits an inclination facing the plane of door 4 itself (see fig. 1).

[0011] By pulling bar 12 of handle 11 for opening door 4, this does not perform an angular movement integral to door 4, like the handles of the prior art;

in other words, handle 11 does not keep the same reciprocal position relative to door 4 in the dynamic step, forcing the operator's wrist to bend to follow the rotation, like the handles of the prior art;

on the contrary, the pivoting arms 13 of handle 11 remain basically horizontal by the effect of the coupling of their fulcrum pins 14 with the fixed fulcrum pins 5 of door 4, carried out through the pairs of levers 15 and 17 and the pair of tie rods 16.

[0012] In this way, handle 11 is in any case positioned before door 4, from the inclination facing the plane of closed door 4 to an inclination substantially coplanar to the plane of open door 4 (see fig. 3), in such movement the user's wrist that exerts the pull is not forced to bend, being able to remain substantially straight, and likewise in the pushing action in the closing step, so that the repetition of the opening and closing operation of door 4 several times during the working sessions or shifts, greatly reduces or better, drastically decreases the stress of the joints.

[0013] Moreover, the inclination of handle 11 substantially coplanar to the plane of open door 4, before the edge of the same, has an accident-prevention function as it prevents accidental contacts of the operator's body with the burning edge, therein providing a control effect.

[0014] The same function, with closed door 4, is performed by the relative coating 9, which defines the air space or interspace 10, which in turn insulates the outer surface thereof from heat.

Alternative embodiments

[0015] It is clear the in further alternative embodiments still falling within the innovation concept implied in the embodiment illustrated above and claimed below, the door structure, of the type for professional ovens for cooking food, according to the present invention can be embodied with technical and mechanical equivalents, that is, provided with further integrative devices, as well as all the shapes of the relative components may be changed suitably for the purpose.

[0016] In particular, the coupling gears between the door and handle fulcrums may be provided on one side only.

Advantages of the invention

[0017] As is clear from the above detailed description of a preferred exemplary embodiment and from the above mention to some alternative embodiments, the door structure, especially for professional ovens for cooking food according to the invention offers the advantages

corresponding to the attainment of the intended purposes as well as others: in fact, it represents a functional and inexpensive innovation suitable for achieving less stress and greater safety for professional operators of ovens for food cooking.

KEY TO NUMBERS

[0018]

- | | | |
|----|-----|---|
| 10 | 1) | Overall oven |
| | 2) | Relative parallelepiped-shaped insulated enclosure |
| | 3) | Relative baking chamber |
| 15 | 4) | Overall door |
| | 5) | Door fulcrum pins |
| | 6) | Door shutter plate |
| | 7) | Relative window |
| | 8) | Relative external frame |
| 20 | 9) | Relative shaped coating |
| | 10) | Interspace or air space defined by the shaped coating |
| | 11) | Overall handle |
| | 12) | Relative horizontal holding bar |
| 25 | 13) | Relative pivoting arms |
| | 14) | Fulcrum pins of pivoting arms |
| | 15) | Upper levers of the coupling gears |
| | 16) | Tie rods of the coupling gears |
| | 17) | Lower levers of the coupling gears |
| 30 | 18) | Spring |

Claims

- | | | |
|----|----|---|
| 35 | 1. | Ergonomic and accident-prevention structure of door for professional ovens for cooking food, characterised in that it comprises a handle (11) with bar (12) pivoting about an axis (14) parallel thereto, suitable for positioning in any case before the door (4) from an inclination facing the closed door (4) plane to an inclination substantially coplanar to the open door (4) plane through coupling linkages (15, 16, 17) to the fulcrum (5) of the door (4) itself. |
| 40 | | |
| 45 | 2. | Ergonomic and accident-prevention structure of door for professional ovens for cooking food, characterised in that it comprises a handle (11) with bar (12) pivoting about an axis (14) parallel thereto, suitable for positioning in any case before the door (4) from an inclination facing the closed door (4) plane to an inclination substantially coplanar to the open door (4) plane through coupling linkages (15, 16, 17) to the fulcrum (5) of the door (4) developing within an air space (10) arranged into the door (4) itself. |
| 50 | | |
| 55 | 3. | Door structure according to claim one or two, characterised in that it comprises: |

- a door (4) with horizontal opening direction by at least one fixed fulcrum pin (5);
 - a handle (11) equipping said door (4) comprised of a holding bar (12) associated thereto by pivoting arms (13) at least one whereof is integral to the relative fulcrum pin (14) in turn integral to at least one lever (15) twinned through at least one tie rod (16) to at least another lever (17) integral to at least one fixed fulcrum pin (5) of the door (4).

4. Door structure according to claim one or two, **characterised in that** it comprises:

- a door (4) with horizontal opening direction by at least one fixed fulcrum pin (5), said door (4) being coated with a coating (9) that defines an interspace or air space (10);
 - a handle (11) equipping said door (4) comprised of a horizontal holding bar (12) associated thereto by two pivoting arms (13) at least one whereof is integral to the relative fulcrum pin (14) in turn integral to at least one lever (15) twinned through at least one tie rod (16) to at least another lever (17) integral to at least one fixed fulcrum pin (5) of the door (4).

5. Door structure according to claim one or two, **characterised in that** it comprises:

- a door (4) with horizontal lowering opening direction through at least one fulcrum pin (5), said door (4) being comprised of a shutter plate (6), with median window (7), reinforced by an external frame (8) projecting outwards and coated by a shaped coating (9) which hides said frame (8) and arranged therein defines an interspace or air space (10) therein including the area of the window (7) to this end made by interfacing two glasses, one associated to the shutter plate (6) and the other associated to the coating (9).
 - a handle (11) equipping said door (4) comprised of a horizontal holding bar (12) extending by the entire width of the door (4) itself, thereto associated at the apex by two pivoting arms (13) at least one whereof is integral to the relative fulcrum pin (14) passing through the respective top portion of the uprights of the frame (8) and integral on the other side to at least one upper lever (15) twinned through at least one tie rod (16) to at least one lower lever (17) integral to at least one fixed fulcrum pin (5) of the door (4).

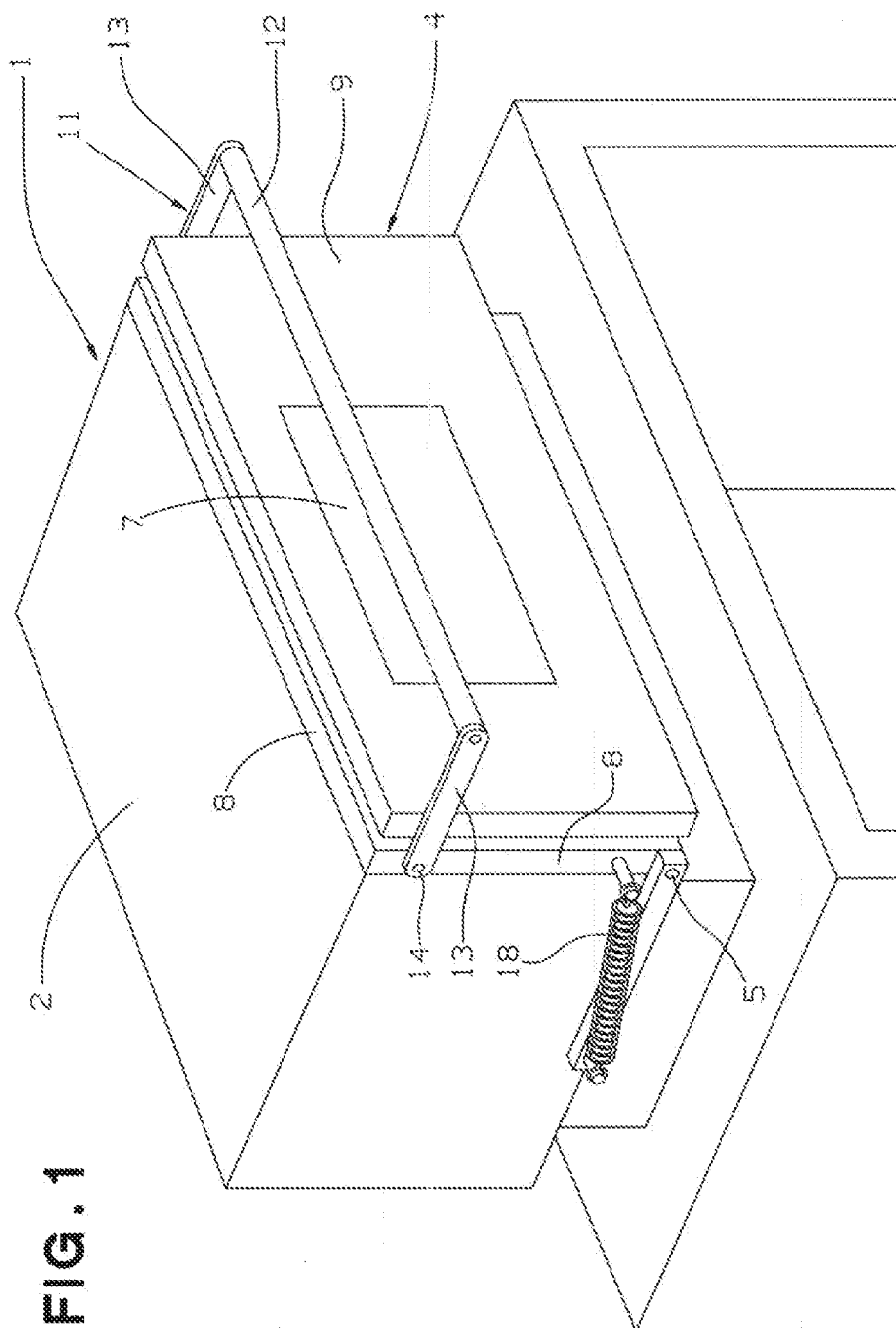
6. Door structure according to claim one or two, **characterised in that** it comprises:

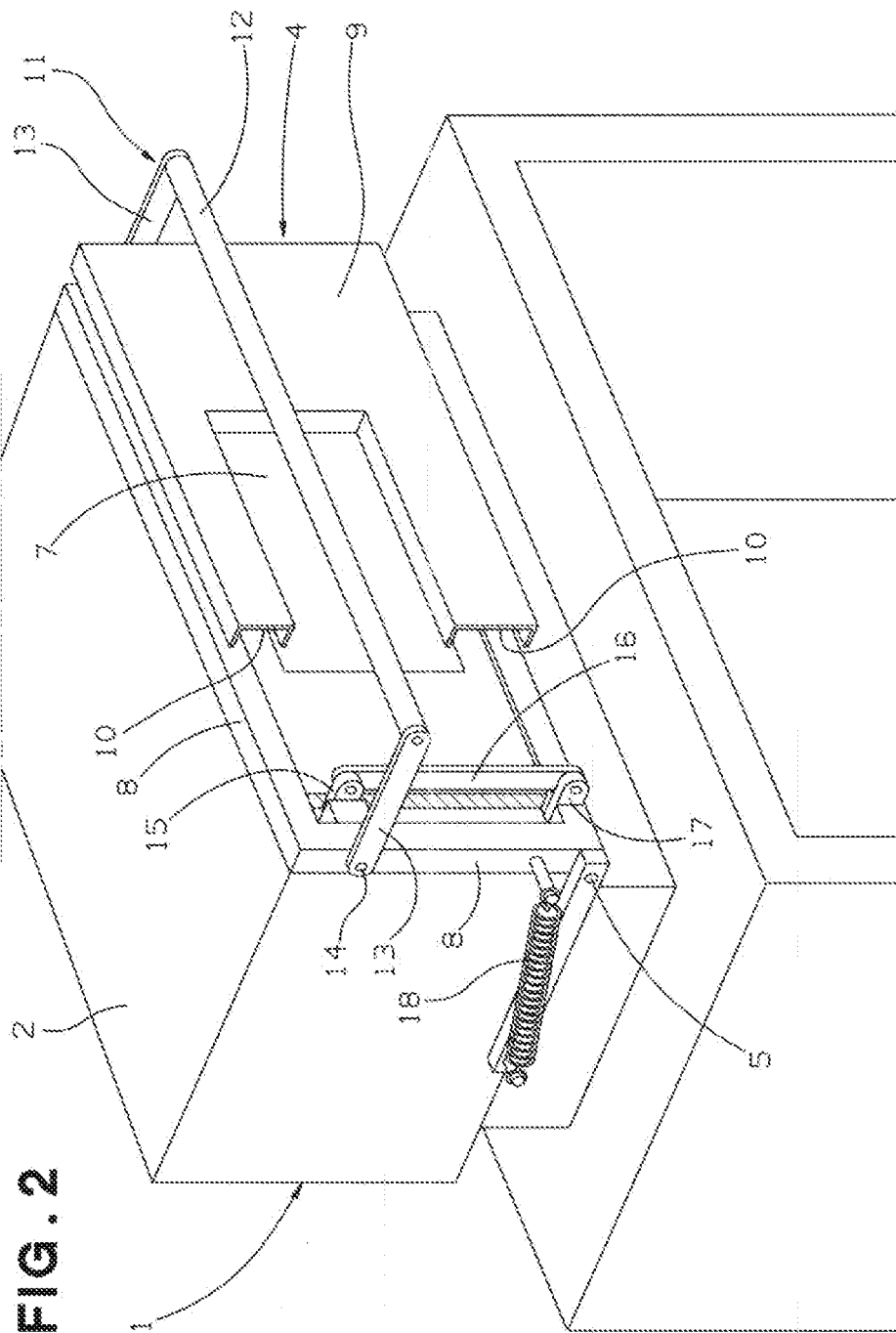
- a door (4) with horizontal lowering opening direction through fixed fulcrum pins (5) distally co-

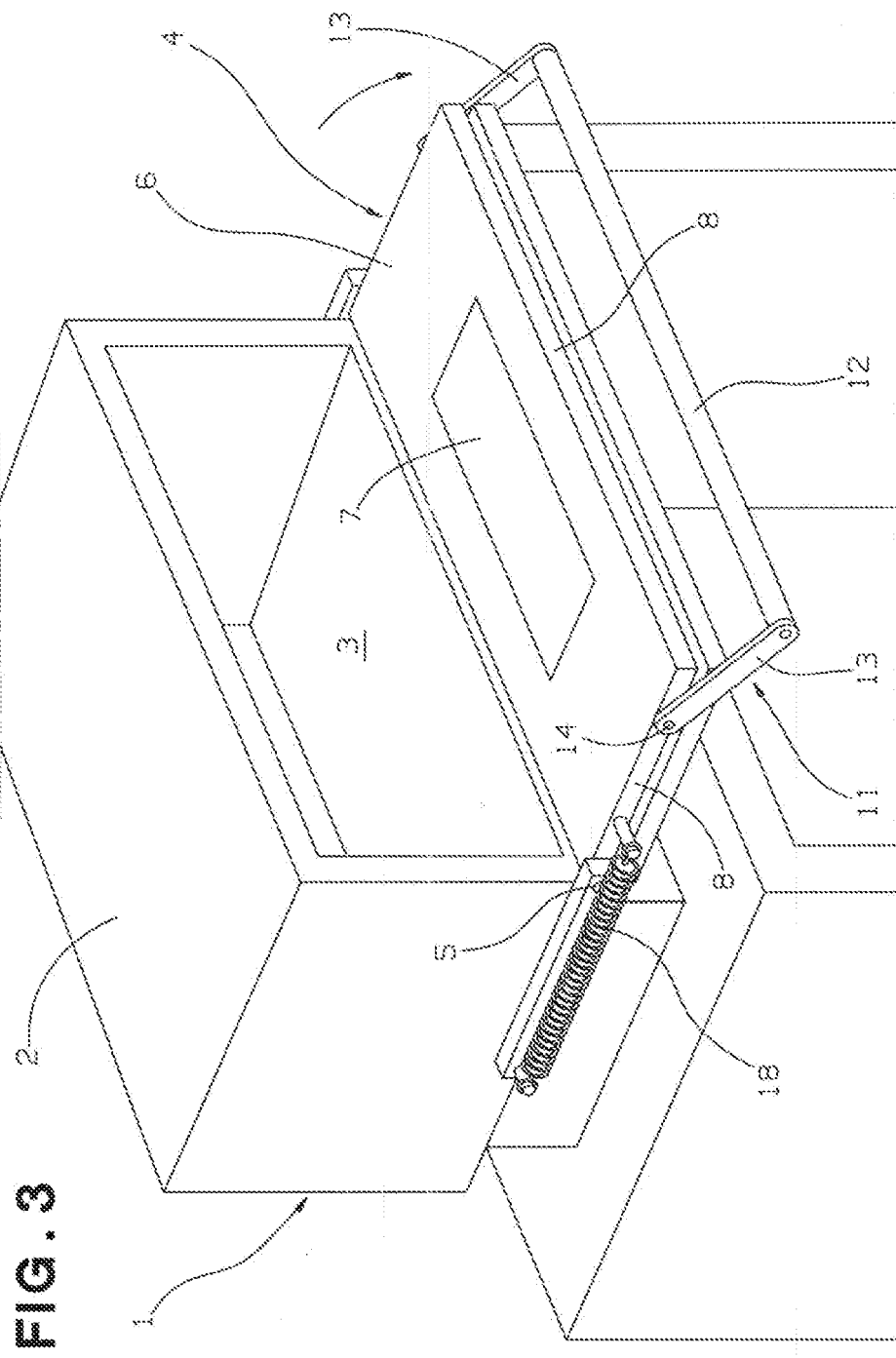
axial in geometrical correspondence of the relevant lower side, said door (4) being comprised of a shutter plate (6), with median window (7), reinforced by an external frame (8) projecting outwards and coated by a shaped coating (9) which hides said frame (8) and arranged therein defines an interspace or air space (10) therein including the area of the window (7) to this end made by interfacing two glasses, one associated to the shutter plate (6) and the other associated to the coating (9).

- a handle (11) equipping said door (4) comprised of a horizontal holding bar (12) extending by the entire width of the door (4) itself, thereto associated at the apex by two pivoting arms (13) integral to the relative fulcrum pins (14) passing through the respective top portions of the uprights of the frame (8) and integral on the other side to respective upper levers (15) twinned through respective tie rods (16) to respective lower levers (17) integral to the fixed fulcrum pins (5) of the door (4).

7. Door structure according to the previous claims, **characterised in that** said door (4) is kept into closed and open position by at least one side spring (18).









EUROPEAN SEARCH REPORT

Application Number
EP 08 15 7540

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	JP 2005 308277 A (MITSUBISHI ELECTRIC CORP; MITSUBISHI ELECTRIC HOME APPL) 4 November 2005 (2005-11-04) * abstract *	1-6	INV. F24C15/02
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 5 November 2008	Examiner Rohr, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 15 7540

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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