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(54) Induction-heating cooking apparatus with device for cooling the circuit elements.

(57) Improvements in the manufacturing and installation of induction hobs, of the type of which the cooking plate is mounted on an opening made to that purpose on the top of the furniture, for its location, being that induction hob composed by the cooking plate (1) and the module (6) including all electronic components, as well as the operation controls (9), in such a way that the above-mentioned module (6) is located under the cooking plate (1), being foreseen that in the module (6) a fan may be incorporated (10).

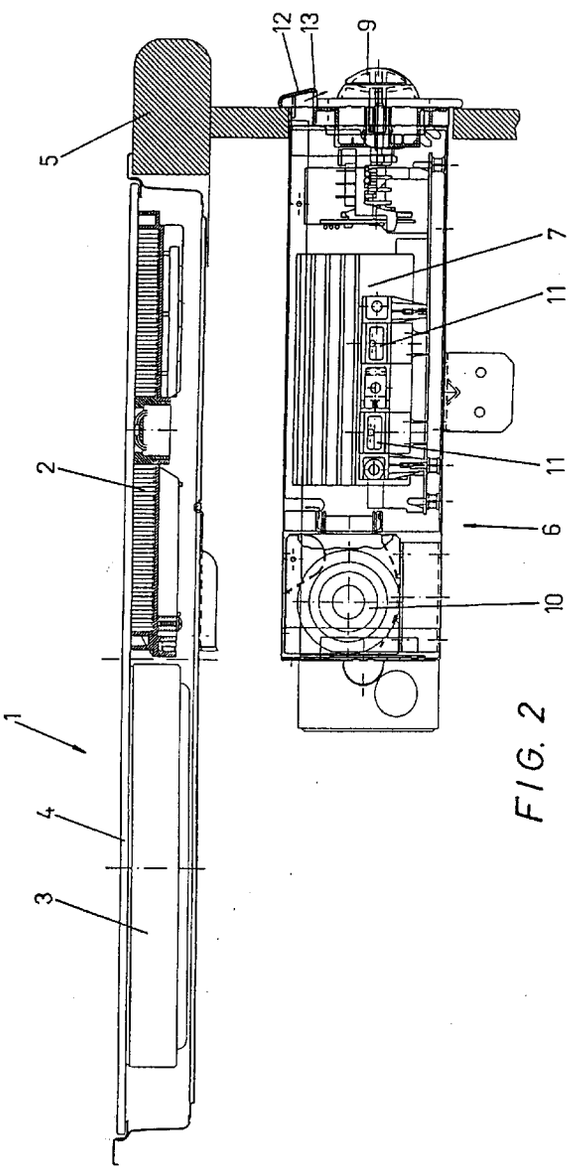

FIG. 2

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OBJECT OF THE INVENTION

The following invention, as stated in the heading of this descriptive memory, consists of some improvements in the manufacturing and installation of induction hobs, of the type of those formed by three modules, which are the cooking plate, the control module and the power module, in such a way that the cooking plate incorporates two cooking areas by radiation and other two cooking areas by induction, disposing of the control lights of residual heat.

The improvements introduced in the manufacturing and installation of induction hobs are aimed to obtain an induction hob, with two modules, being one of them the cooking plate and the second one, located under the cooking plate, will have the operation controls and the power and control elements, obtaining therefore a more compact body, which means a simplification in terms of industrialization.

The power and control module is basically formed by two or more power plates, a control plate, a fan and the operation controls, obtaining therefore a compression of electronics, by reducing the number of electronic components, which means the subsequent economic saving and a greater simplicity of installation.

BACKGRUND OF THE INVENTION

Conventionally, the induction hobs incorporate induction heating elements or combined with vitreousceramic elements by radiation, defined by corresponding coils located under the ceramic glass on which the recipient for cooking the food is located.

The cooking plate will be installed in an opening made to that purpose on the top of the furniture on which it is mounted, being fixed to the top of the furniture in many different ways. The control module is formed by a frame with a keyboard to control the switch on and the power level of the four heating elements. The electronic control of the whole hob is performed by a microprocessor located in the control module.

The control module will be installed in an opening made on the top of the furniture, separated a certain distance from the cooking plate in order to avoid splashing and, at the same time, to allow its connection with the power module.

The power module is formed by a metallic box having the electronic components that, controlled by the microprocessor, sees about powering the heating elements. This module will be connected to the mains for the current supply.

In the installation of the power module, this is located in the lower part of the furniture, behind the wall tile, being connected to, apart from the mains as indicated above, the cooking plate and the control module.

In the wall tile there will be a ventilation opening on which the corresponding grid will be located.

The installation of the power module is performed in a position far from the cooking plate, as a consequence of the temperature reached by the electronic components, which would cause their possible damage.

On the other hand, the installation of the power module in the lower part of the furniture has the inconvenience that, in case of some unexpected water overflowing, caused by other household goods such as the washing machine or the dish washer, installed near the cooker, it may cause its damage.

DESCRIPTION OF THE INVENTION

In this memory, we describe some improvements in the manufacturing and installation of induction hobs, by which the hob is formed by two bodies or modules, being one of them the cooking plate, and the second one a module with the power and control plates and the operation controls, in such a way that in the installation the cooking plate is located in the corresponding opening on the top of the furniture and the module with the power and control plates and the operation controls is located under the cooking plate, but near it.

The module located under the cooking plate incorporates the power plates, the control plate, and the operation controls, as well as a fan, which is located in relation to the power plates in order to produce a flow of air that diminishes the temperature of the components of those plates, given that their components, either by the transistors incorporated or by the effect of the heat radiated by the calorific elements, may reach an excessive temperature which could damage them.

The fan is attached to the internal wall of the module, which has a grid in order to allow air intake that goes out by the front side of the module, once it has circulated in relation to the electronic components of the power plates reducing their temperature, in such a way that the module may be located under the cooking plate without producing any damage in its electronic components.

By manufacturing the induction hob in the way so far described, there is a reduction in the number of electronic components, compressing the electronics, and it is feasible to incorporate a standard control module of those used in other hob models, which simplifies the industrialization, all of it meaning an economic saving since, conventionally, a specific control module, with an electronic control, should be mounted.

In order to complete the description that follows, and also to help to a better comprehension of its features, this descriptive memory encloses a set of plans, whose figures, in an illustrative and not limita-

tive way, show the most significant details of the invention, described in this memory.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1. Shows a plan view of the module of the induction hob, that incorporates the power and control plates and the operation controls, as well as the fan.

Figure 2. Shows a view cross-sectioned in lateral elevation of the module represented in the previous figure, where we can notice how the module is under the cooking plate, with the power and control plates and the rest of elements, in such a way that in the front part there is an ornamental device that leads the flow of air to the lower part.

DESCRIPTION OF A PREFERRED EMBODIMENT

After seeing the above-mentioned figures and following the numbering adopted, we can notice how the cooking plate 1, with its corresponding calorific elements 2 and 3, of cooking by induction and radiation respectively, located under the ceramic glass 4 where we cook, is mounted on the top of the furniture 5, in such a way that, under it, the module 6 is mounted, incorporating the power plates 7, the control plate 8, the operation controls 9, and the fan 10.

The fan 10 is located near the internal side of the module 6, where there is a grid 14 that allows and easy suction of the air that, circulating over the power plates 7, goes out through the front part, thus avoiding an excessive heating of the electronic components, as a consequence of the heat radiated by the calorific elements 2 and 3, and by the transistors 11, and allowing the location of the module 6 under the cooking plate 1, and not in the lower part of the furniture.

In the front part of the furniture is arranged the ornamental device in such a way that is is defined by a bevel 12 that forms a hollow, opened in its lower part to create a passage 13 for the air, which will be therefore lead to the lower part and not frontally to the user.

So, it is feasible to mount under the cooking plate 1 the module 6, with all the necessary components for the proper operation of the induction hob.

Considering the above description so far, in relation to the new induction hob, object of this patent, we can mention, among others, the following advantages:

a) With regard to its manufacturing:

* The hob is composed of two modules: cooking plate 1 and module 6, with all its components mounted on it.
* Incorporation of standard controls in the module 6, in front of the specific control module used conventionally for the electronic control of the operation controls and located in a opening made to that purpose on the top of the furniture.
* Less electronic components, that is to say, we obtain a more compact module.
* Fewer wiring among modules, being also less long.
* Simplification of the industrialization (standard controls).

b) With regard to its installation:

* The installation is performed in a more simple (just two modules) and also more convenient way (the two modules are mounted in places which are easily accesible for the installer).

To sum up, with the induction hob described above, the installation is significantly simplified.

* If there is an overflow, the water will not damage any component while, with the conventional installation, in case of overflow, the water may damage the power module due to its installation on the floor.
* There is a lesser intake of dirtiness.
* There are fewer interferences because of the lesser lenght of the wiring.

All the above-mentioned advantages mean a considerable economic saving, by using less components and also due to its easy industrialization.

Claims

1.- IMPROVEMENTS IN THE MANUFACTURING AND INSTALLATION OF INDUCTION HOBS, of the type of which the cooking plate is mounted on an opening made to that purpose on the top of the furniture, mainly characterized because the induction hob is composed of the cooking plate (1) and the module (6), which groups all the electronic components, as well as the operation controls (9), being located under the cooking plate (1), being foreseen that in the module (6) is mounted a fan (10) attached to the internal side supplied with a grid (14) in order to allow the air intake that passing through the power plates (7) will go out through the front side, with the special feature that the front ornamental device it is defined by a bevel (12) that forms a hollow opened in the lower part, creating a passage (13) so that the air may be lead to the lower part.

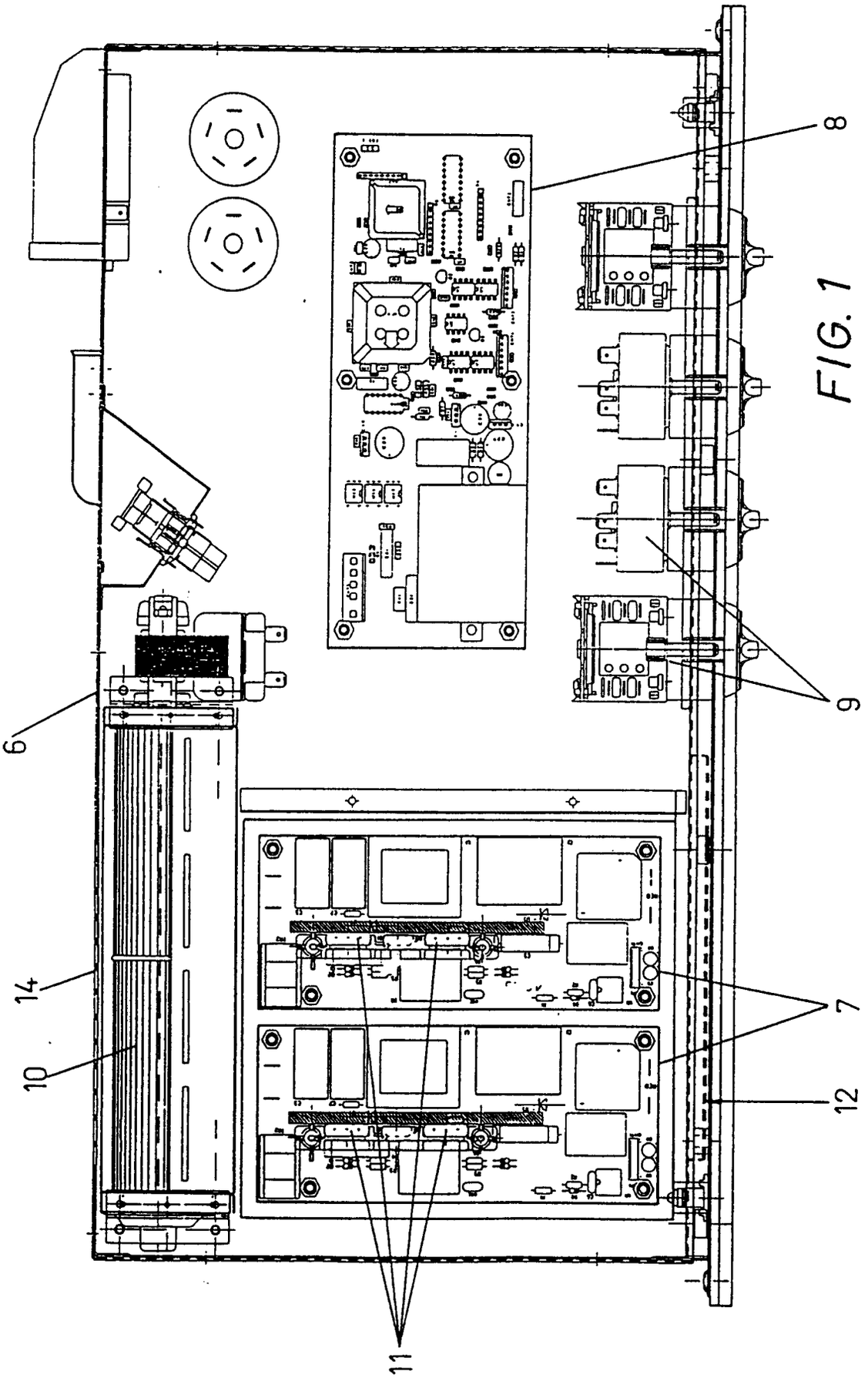

FIG. 1

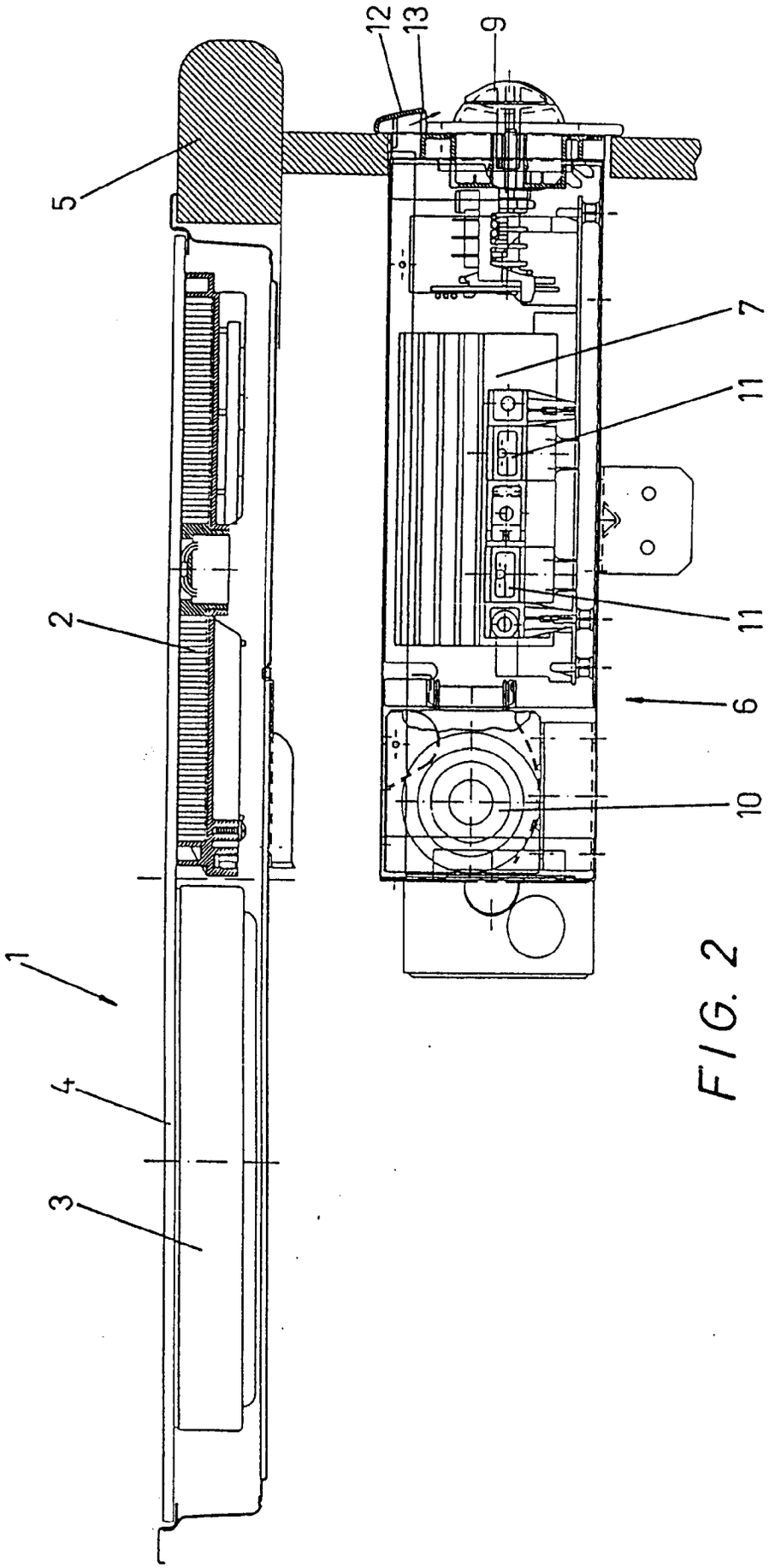

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number EP 94500181.6

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)
X	DE - A - 4 208 249 (E.G.O.) * Column 3, line 23 - column 4, line 3; fig. 2-5 * --	1	H 05 B 6/12 H 05 B 6/06
A	US - A - 4 468 548 (YAMAKI) * Column 2, line 57 - column 3, line 8; column 3, lines 40-46; fig. 2,3 * --	1	
A	US - A - 4 490 596 (HIRAI) * Column 5, lines 16-27; claim 1; fig. 3,4,9,10 * --	1	
A	US - A - 4 983 799 (BONNET) * Column 3, lines 9-43; claim 1; fig. 1 * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl. 6)

F 24 C 7/00
H 05 B 1/00
H 05 B 3/00
H 05 B 6/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	28-03-1995	TSILIDIS

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
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