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(54) **Foldable induction cooker device**

(57) Induction cooking device that comprises a body (2) that is disposed on a worktop (4) and a heating unit (1) that is connected to the body (2) and which may be folded in relation to said body (2), it being capable of being disposed on the worktop (4) in a substantially horizontal active position (Pa) or in a substantially vertical rest position (Pr). The heating unit (1) comprises a cooking plate (18) and at least one induction heating element (10) disposed beneath the cooking plate (18), and the body (2) comprises electronic means (20) that comprise supply means for supplying the induction heating elements (10) and control means for controlling said supply. The device (100) comprises first means adapted to cool the body (2) and second means adapted to cool the heating unit (1), the first and second means being independent to each other.

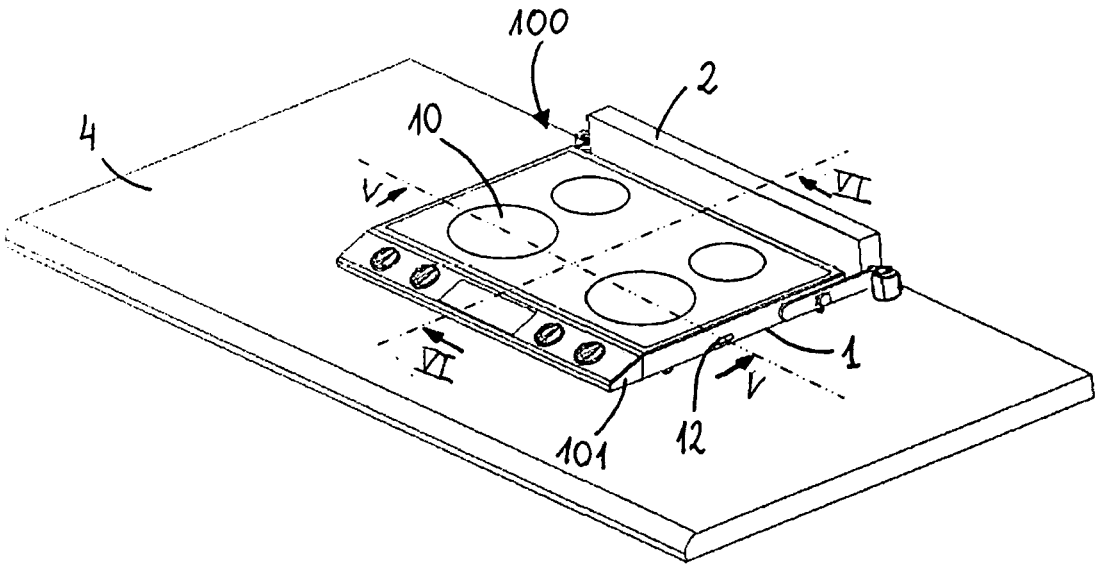

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to cooking devices for heating or cooking food, and more specifically to induction cooking devices that comprise a plurality of induction heating elements for heating or cooking food.

PRIOR ART

[0002] Induction cooking devices comprise a heating unit with at least one induction heating element and electronic means for supplying said element and controlling said supply, which are normally disposed beneath the heating unit or even integrated in the unit itself, disposed beneath the induction heating element. In said devices part of the thermal energy (heat) generated when they are operating is deflected downwards, possibly affecting the electronic means in such circumstances. Furthermore, the devices are usually disposed in environments close to other domestic appliances, such as ovens, which means that at least part of the heat generated by said domestic appliances may affect said electronic means. This arrangement of the electronic means also limits the space available beneath said unit, only domestic appliances with specific dimensions being capable of being disposed beneath said unit, such as an oven (or cabinets, for example, their dimensions being restricted due to the space occupied by the electronic means).

[0003] The patent application US 2006/0289489 A1 discloses an induction cooking device in which the electronic means are not disposed directly below the heating unit. In said device an oven is disposed beneath the heating unit, the electronic means being disposed beneath the oven or on one side in relation to said oven, said means possibly being affected by the heat generated by said oven and the space available beneath said heating unit also being restricted. The electronic means are some distance from the heating unit, which may also cause difficulties during its assembly and/or maintenance for example.

[0004] Patent application US3740513, for example, discloses a device that is disposed beneath a dining table, in such a way that said table (or worktop) may also be used by a user for eating and other purposes. However, the heat generated by the heating unit may affect the electronic means, and furthermore both the heat produced by said device and the smoke generated during cooking may affect the user.

[0005] Patent application FR 2340513 A1 discloses an induction cooking device that comprises a heating unit that is disposed in a horizontal position and a body with electronic means, which is disposed in a vertical position in relation to the heating unit, an aim being to improve the restrictions that said electronic means give rise to in the space available beneath the heating unit. The area below said heating unit comprises cooling circuits adapted so that the air that cools the electronic means does not affect the induction heating element, these being connected both to said electronic means and said induction heating element, comprising said cooling means. The cooling means also comprise entry grooves on their lower surface by which the cooling air enters, said air being distributed towards the induction heating element circulating through the lower housing or towards the electronic means circulating through the lower housing, there being a risk of inefficient cooling if the air is not distributed correctly as the air is distributed in the same way in all cases (different temperatures, different power levels etc).

[0006] The Japanese patent JP 06-215859 discloses an induction cooking device that comprises a body with the electronic means, which is disposed in a vertical position, and a heating unit that may be disposed in a horizontal position in order to be used and which can be hinged in relation to the body. The body necessarily comprises a fan in order to circulate the cooling air that cools the electronic means, the device also comprising means for transmitting said cooling air to the heating unit for cooling the induction heating element and the lower surface of said heating unit. The cooling air that reaches the heating unit previously cools the electronic means, which means that it reaches said cooling unit at a temperature that hampers or delays the cooling of the induction heating element and the lower surface of said heating unit, potentially causing unwanted damage to the worktop or injury to a user attempting to unhinge it for example, due to excessive temperatures or to the excessive time exposure of said lower surface to certain temperatures.

DISCLOSURE OF THE INVENTION

[0007] It is an object of the invention to provide an induction cooking device with improved cooling in relation to the prior art.

[0008] The induction cooking device of the invention comprises a body that is disposed on a worktop and a heating unit that is connected to the body and which may be foldable in relation to said body, it being capable of being disposed on the worktop in a substantially horizontal active position ready to be used or in a substantially vertical rest position. The heating unit comprises a cooking plate and a plurality of induction heating elements disposed beneath the cooking plate, and the body comprises an electronic component that comprises supply means for supplying the induction heating elements as well as control means for controlling said supply. The device comprises first means adapted to cool the body (and more specifically the electronic means) and second means adapted to cool the heating unit, the first and second means being independent to each other.

[0009] In this way, the body and the heating unit may be cooled independently, the first means being adapted in order to optimise the cooling of said body independently to the cooling of the heating body, and the second means being capable of being adapted in order to opti-

mise the cooling of said heating unit independently to the cooling of the body.

[0010] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is a perspective view of a first embodiment of the device of the invention.

FIG. 2 is a perspective view of a second embodiment of the device of the invention.

FIG. 3 is a lateral view of the device of FIG. 1, with the heating unit in a active position.

FIG. 4 is a lateral view of the device of FIG. 1, with the heating unit in a rest position.

FIG. 5 is a sectional view of the heating unit of the device of FIG. 1, according to V-V section of said FIG. 1.

FIG. 6 is a sectional view of the body of the device of FIG. 1, according to VI-VI section of said FIG. 1.

FIG: 7 is a sectional view of the device of FIG. 2, according to VII-VII section of said FIG. 2.

DETAILED DISCLOSURE OF THE INVENTION

[0012] In figures 1 and 2 a first embodiment and a second embodiment of the induction cooking device 100 of the invention is shown. The device 100 comprises a body 2 that is disposed in a substantially vertical position on a worktop 4 and which is affixed to the worktop 4, and a heating unit 1 that is connected to the body 2 and which may be folded in relation to said body 2, being capable of being disposed on said worktop 4 in a substantially horizontal active position Pa when it is to be used (heating unit 1 of figure 3 for the first embodiment, and heating unit 1 in continuous line of figure 7 for the second embodiment) or in a substantially vertical rest position Pr on said worktop 4 and on said body 2 when it is not to be used (heating unit 1 of figure 4 for the first embodiment, and heating unit 1 in discontinuous lines of figure 7 for the second embodiment). The device 100 is, therefore, disposed on the worktop 4, in an area of minimum impact on the environment that surrounds other domestic appliances that may be disposed in the near proximity, such as ovens, thereby reducing or eliminating the risk of the device 100 being affected by the heat that may be generated by said other domestic appliances and, in general, by the heat emitted by external heat sources. In addition, the two heat sources of the device 100, the heating unit 1 and the body 2, are disposed independently to each other, as shown in the figures.

[0013] With reference to figure 5, valid for both embodiments, the heating unit 1 comprises a cooking plate 18 on which may be disposed a saucepan or other cooking utensil, preferably two induction heating elements 10 being disposed beneath the cooking plate 18 in order to heat the food, although it may also comprise one, three, four or more induction heating elements 10. The body 2 comprises electronic means 20 that also comprise supply means (not shown in the figures) for supplying the induction heating elements 10 of the heating unit 1 and control means (not shown in the figures) for controlling said supply.

[0014] The device 100 comprises first means adapted to cool the body 2 and second means adapted to cool the heating unit 1, the first and second means being independent to each other. In this way, both the body 2 and the heating unit 1 may be cooled, the cooling of each of them being optimised independently.

[0015] The heating unit 1 comprises a base 13 onto which is affixed the cooking plate 18, the base 13 and said cooking plate 18 delimiting an internal space where the induction heating elements 10 are disposed. Said internal space is disposed vertically (when the heating unit 1 is in the active position Pa) between said cooking plate 18 and a lower part 13a of the base 13, said lower part 13a comprising a lower surface 13a' that faces the worktop 4 with the heating unit 1 in said active position Pa. Said unit 1 also comprises at least one sheet 17, preferably of aluminium, which is disposed transversally in said internal space, said heating unit 1 comprising a cooling space 14 between said sheet 17 and the lower part 13a of the base 13, said cooling space 14 being part of the second cooling means.

[0016] The second means may be adapted to cool the heating unit 1 by means of the circulation of air, and more specifically to obtain the minimum heating of the lower part 13a of the base 13 that faces the worktop 4 when said heating unit 1 is in the active position Pa, this being facilitated by means of the cooling space 14, and a suitable cooling of the residual heat that may be generated in the cooking plate 18. For the suitable cooling of the residual heat, said heating unit 1 comprises at least one inlet window 11, which preferably comprises a plurality of grooves and which is preferably disposed in the lower part 13a of the base 13, and at least one outlet window 12, which may also comprise a plurality of grooves and which is preferably disposed on one side 13b, 13c of said base 13. Preferably, said second means comprise as many inlet windows 11 as the device 100 comprises induction heating elements 10, each inlet window 11 being disposed beneath their corresponding induction heating element 10. Thus, with two induction heating elements 10, the second means comprise an inlet window 11 beneath each induction heating element 10 and an outlet window 12 on each side of the base 13. Thus, through the inlet window 11 air may enter for the cooling, which

after circulating through the cooling space 14 may exit through the outlet window 12, reference A in figure 5. As the inlet window 11 is disposed facing the worktop 4, the air that circulates through said cooling space 14 originates from an area free of harmful elements (smoke and/or hot air originating from the cooling of the body 2 or from the heating unit 1 itself, for example). In the same way, as the outlet window 12 is disposed on one of the sides 13a, 13b of the base 13, the air, once it has circulated through cooling space 14, does not impact directly on the body 2, thereby reducing or eliminating the effect that the cooling of the heating unit 1 may cause on the cooling of said body 2.

[0017] The heating unit 1 is disposed in the active position Pa in such a way that between the base 13 and the worktop 4 there is a separation space 16. Preferably, said heating unit 1 comprises at least one support 15 affixed beneath the base 13, which is supported on the worktop 4 when said heating unit 1 is in the active position Pa, a separation space 16 being formed between said worktop 4 and said heating unit 1. The heating unit 1 preferably comprises four supports 15, two fixed beneath the front part of the lower part 13a, one on either side, and another two beneath the rear part, one on either side, thereby providing a uniform support on the worktop 4. Thus, due to the separation space 16, cooling air may enter the internal space through the inlet window 11 before then exiting through the outlet window 12, thereby generating a circulation of air between said windows 11 and 12 for the cooling of the heating unit 1. Said air may refrigerate both the induction heating elements 10 and the lower part 13a of the base 13, the heat generated by said heating unit 1 not affecting, therefore, the worktop 4.

[0018] The circulation of air through the cooling space 14 may also be forced, a fan (not shown in the figures) being disposed on the inlet window 11, supplied by means of the electronic means 20. In the heating unit 1 may be disposed sensor means (temperature sensors) for measuring the temperature at the required points of said heating unit, such as on the sheet 17 beneath the induction heating element 10 and in the bottom part 13, said electronic means 20 being capable of supplying said fan according to the temperature measured by the sensors, thereby optimising the use of said fan. In this way the activation/deactivation and the speed of rotation of the fan may be regulated in accordance with the temperature measured, the operating of said fan being adjusted in accordance with the requirements at each particular time, thereby optimising the cooling. In addition, the fact that the operating of said fan may be controlled means that there is no need to have it running all the time and at a certain power level (speed of rotation), thereby reducing the level of noise produced by the fan, which may be bothersome.

[0019] The electronic means 20 may also comprise storage means (not shown in the figures), such as condensers, for storing energy while the device 100 is switched on. When said device 100 is switched off, said storage means may supply said fan so that it may operate if necessary. When the device 100 is switched off, the control means may ascertain the temperature at the points of interest of said heating unit 1 by means of the temperature sensors, the stored energy being capable of being transferred to the fan so that it cools the induction heating elements and/or the lower part 13a of the base 13 in the event that it is determined that the temperature of said points is higher than a predetermined temperature (selected by the manufacturer), which may be, for example, a temperature that does not affect the user in the event of their touching an induction heating element 10.

[0020] Instead of being adapted to cool the heating unit 1 by means of the circulation of air, the second means may comprise a thermal blanket (not shown in the figures) in the cooling space 14 fixed beneath the sheet 17. This thus prevents the heat of the induction heating elements 10 being transmitted to the lower part 13a of the base 13, the heat generated by said heating unit 1 not affecting, therefore, the worktop 4.

[0021] In the first embodiment, when the heating unit 1 is in the rest position Pr the cooking plate 18 does not face the electronic means 20 of the body 2, but is disposed, rather, on said body 2 facing a wall 3. Thus, the possible residual heat that may remain in said cooking plate 18 after it has been used does not affect said body 2 and does not, therefore, affect the electronic means 20.

[0022] The body 2 comprises a cover 21 for covering the electronic means 20, the first means comprising at least one inlet hole 22 disposed on the cover 21 and through which may enter air for the cooling of said body 2 (of the electronic means 20), at least one outlet hole 23 disposed on said cover 21 and through which may exit said air once it has cooled said body 2, and a fan (not shown in the figures) for forcing the circulation of the air from the inlet hole 22 to the outlet hole 23, circulation shown with reference B in figures 6 and 7. In the body 2 may be disposed sensor means (temperature sensors) for measuring the temperature at the points of interest of said heating unit, such as the points of interest of the electronic means 20, said electronic means 20 being capable of supplying said fan in accordance with the temperature measured by the sensors, thereby optimising the use of said fan, in a similar way to the use of the fan of the heating unit 1.

[0023] The inlet hole 22 is preferably disposed in a rear part 21a of the cover 21, which faces a wall 3 with a gap between both so that the air that enters the body 2 is not affected by the heat that may be emitted by the heating unit 1 or even by the smoke that may be generated during cooking. The outlet hole 23 is preferably disposed in the rear part 21a, but it may also be disposed on the sides of said cover 21.

[0024] Instead, by means of a circulation of air, the first means may comprise a module known conventionally as a "Peltier" module (not shown in the figures) and/or a module known conventionally as a "Heat Pipe" module (not shown in the figures) which are disposed between

the electronic means 20 and the rear part 21a of the cover 21, the heat of said electronic means 20 thereby being transmitted to said rear part 21a by means of said modules, said electronic modules 20 thereby being cooled. In this case, the rear part 21a is preferably of a conductive material and is disposed supported directly on the wall 3 so that the heat transmitted to said rear part 21a is dissipated through said wall 3.

[0025] In the second embodiment the body 2 may also comprise a filter 25 that extends substantially horizontally on one end of said body 2, it then facing the heating unit 1 when said heating unit 1 is in the active position Pa. The filter 25 is adapted in order to absorb the smoke, for example, that is generated during cooking, thereby reducing the risk of said smoke affecting the electronic means 20 through conduction (the heat of said smoke) or the cooling air that enters said body 2. In said second embodiment, an absorbing means (not shown in the figures) preferably disposed on the filter 25, a fan for example, helps said filter to absorb said smoke, and said absorbing means can also absorb at least a part of the air that enters the body 2 through the inlet hole 22.

[0026] With all these characteristics, a device 100 is obtained in which the heat generated by the body 2 does not affect or reduces the effect it may have on the heating unit 1 in relation to the prior art, the refrigeration of said body 2 and said heating unit 1 thus being optimised independently without the need for algorithms or the calculation of parameters related both with the body 2 and with the heating unit 1 for example.

[0027] The device 100 may also comprise, in first and second embodiments, a control pad 101 (a user interface) so that a user may select the required induction heating elements 10 and the power applied to each of said induction heating elements 10. For this purpose said control pad 101 comprises an electronic component (not shown in the figures) that is connected by means of a cable to the electronic means 20 of the body 2 in order to supply it and to set the power level in the corresponding induction heating element 10. T he control pad 101 is preferably connected to the heating unit 1 (although it may also be connected to the body 2) by means of connection means (not shown in the figures) that may comprise, for example, conventional clips, said control pad 101 being capable of being released so that it may be disposed in the required place by the user. Thus, the control pad 101 may be disposed in a place free of smoke or far from the heating unit 1 and the body 2, for example, said smoke or the temperature of said heating unit 1 and said body 2 not affecting the electronic component of the control pad 101, which may remain at an acceptable temperature without the need for additional cooling. Said control pad 101 can be affixed to the heating unit 1 or to the body 2, not being possible to free said control pad 101 from them.

Claims

1. Induction cooking device that comprises a body (2) that is disposed on a worktop (4) and a heating unit (1) that is connected to the body (2) and which may be folded in relation to said body (2), it being capable of being disposed on the worktop (4) in a substantially horizontal active position (Pa) or in a substantially vertical rest position (Pr),
the heating unit (1) comprising a cooking plate (18) and at least one induction heating element (10) disposed beneath the cooking plate (18), and
the body (2) comprising electronic means (20) that comprise supply means for supplying the induction heating elements (10) and control means for controlling said supply,
characterised in that
the device (100) comprises first means adapted to cool the body (2) and second means adapted to cool the heating unit (1), the first and second means being independent to each other, the cooling of both said body (2) and said heating unit (1) being capable of being optimised independently.

2. Device according to the preceding claim, wherein the heating unit (1) comprises a base (13) onto which is affixed the cooking plate (18), the base (13) and said cooking plate (18) delimiting an internal space where the induction heating elements (10) are disposed, and at least one sheet (17) that is disposed transversally in the internal space, said heating unit (1) also comprising at least one inlet window (11) disposed on a lower part (13a) of the base (13), at least one outlet window (12) disposed on one of the sides (13b, 13c) of said base (13), and a cooling space (14) between the sheet (17) and the lower part (13a) of the base (13), said cooling space (14) being part of the second cooling means, air being allowed to enter for cooling through the inlet window (11) and exit through the outlet window (12) after circulating through the cooling space (14).

3. Device according to claim 2, wherein the second means comprise at least one fan for forcing the circulation of the air from the inlet window (11) to the outlet window (12), the operating of said fan being regulated in accordance with the temperature detected in said heating unit (1) by means of sensor means disposed in said heating unit (1).

4. Device according to claim 3, wherein the electronic means (20) comprise means for storing energy while the device (100) is switched on and which may supply the fan so that when said device (100) is switched off, the fan may continue to operate by means of said supply if at least one of the induction heating elements (10) comprises a temperature higher than a certain temperature.

5. Device according to claim 2, wherein in the cooling space (14) is disposed a thermal blanket affixed to the sheet (17).

6. Device according to any of the preceding claims, wherein the body (2) comprises a cover (21) for covering the electronic means (20), the first means comprising at least one inlet hole (22) disposed in the cover (21) through which air may enter for the cooling, at least one outlet hole (23) disposed in said cover (21) through which said air may exit, and a fan for forcing the circulation of the air from the inlet hole (22) to the outlet hole (23), the operating of said fan being regulated in accordance with the temperature detected by sensor means disposed in said body (2).

7. Device according to claim 6, wherein the inlet hole (22) is disposed in a rear part (21a) of the cover (21), and the outlet hole (23) is disposed in the rear part (21a) or on one of the sides (21b, 21c) of said cover (21).

8. Device according to any of claims 1 to 6, wherein the body (2) comprises a cover (21) for covering the electronic means (20), the first cooling means comprising a "Peltier" module and/or a "Heat Pipe" module, which are disposed between said electronic means (20) and a rear part (21a) of the cover (21), the heat from said electronic means (20) being transmitted to said rear part (21a) by means of said modules, said electronic means (20) thereby being cooled.

9. Device according to claim 8, wherein the rear part (21a) of the cover (21) is of a conductive material and is disposed supported on a wall (3) so that the heat transmitted to said rear part (21a) is dissipated through said wall (3).

10. Device according to any of the preceding claims, wherein when the heating unit (1) is in the rest position (Pr), said heating unit (1) is disposed on the body (2).

11. Device according to any of the claims 1 to 9, wherein the body (2) comprises a filter (25) that extends substantially horizontally on one end of said body (2), it then facing the heating unit (1) when said heating unit (1) is in the active position (Pa).

12. Device according to any of the preceding claims, wherein it comprises a control pad (101) connected to the electronic means (20) of the body (2) so that a user may control the power of the induction heating elements (10), said control pad (101) being capable of being anchored to the heating unit (1) or to the body (2) by means of anchoring means, or of being freed from said heating unit (1) and from said body (2).

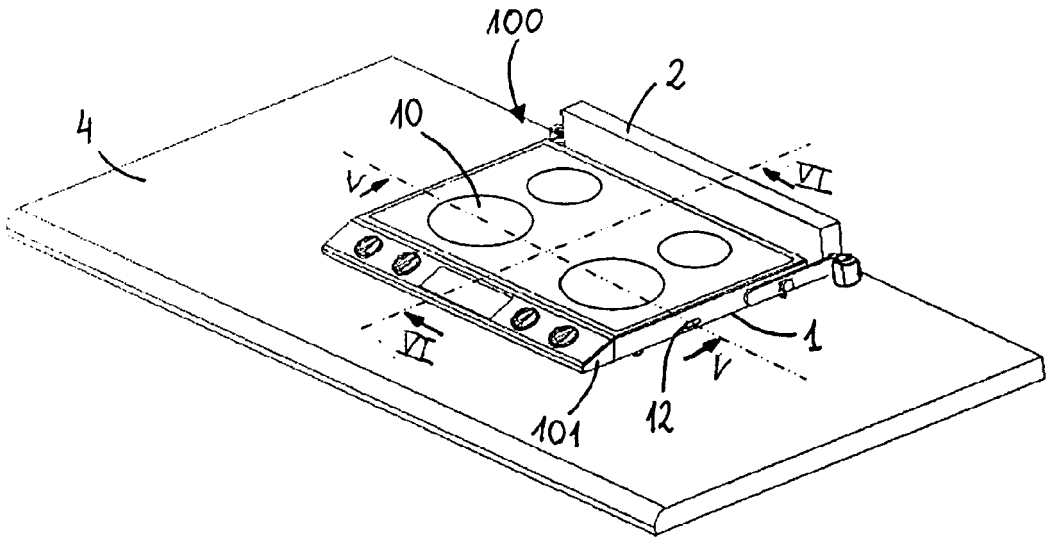

Fig. 1

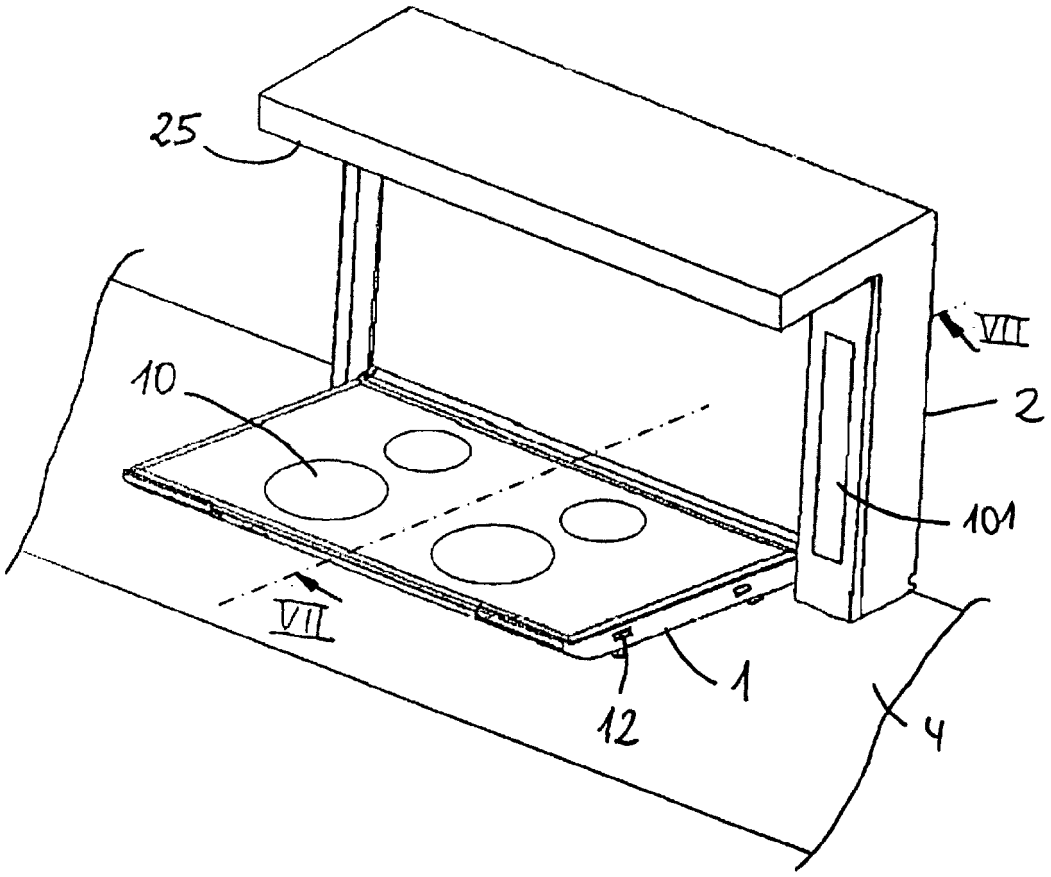

Fig. 2

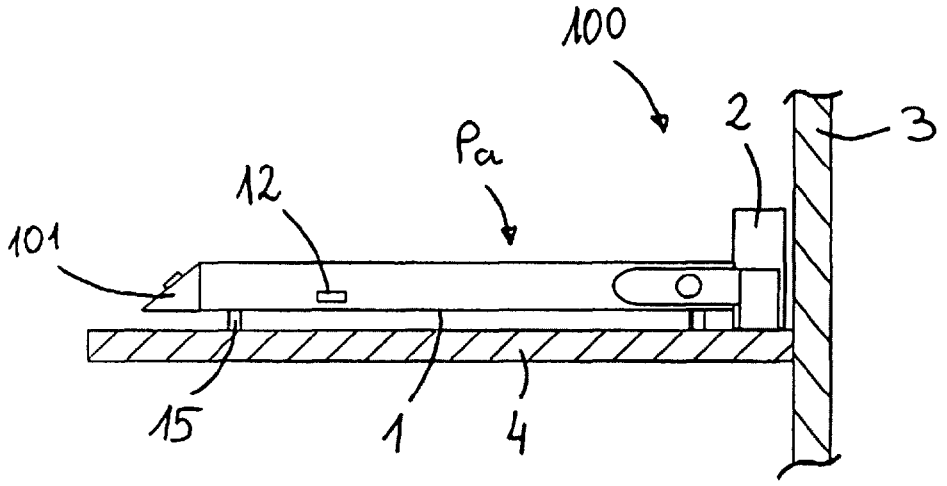

Fig. 3

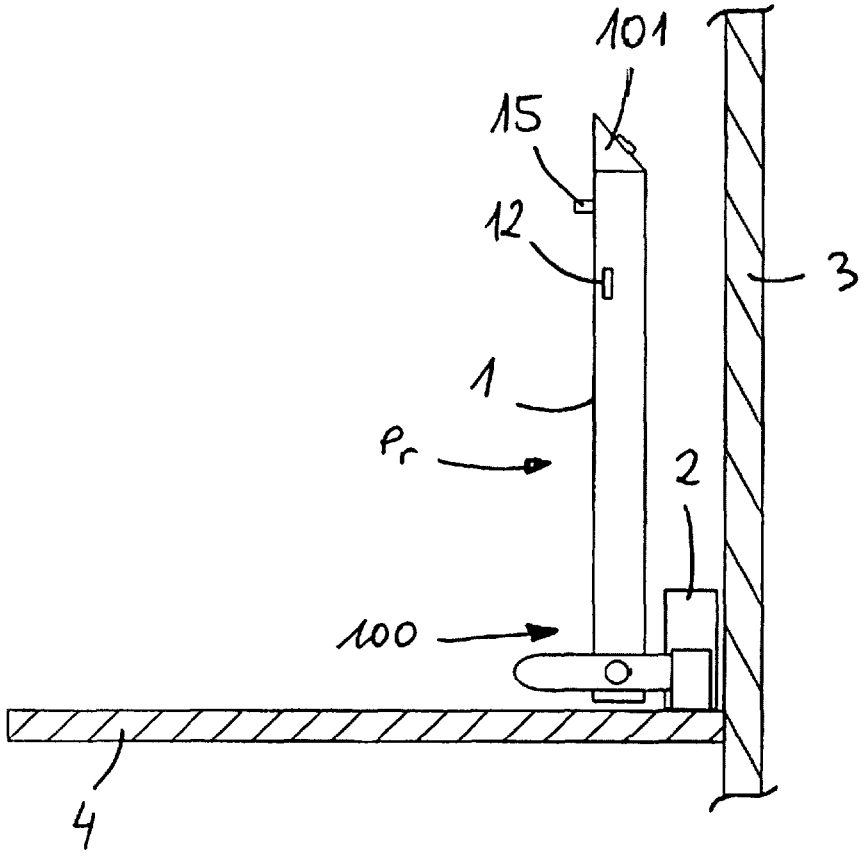

Fig. 4

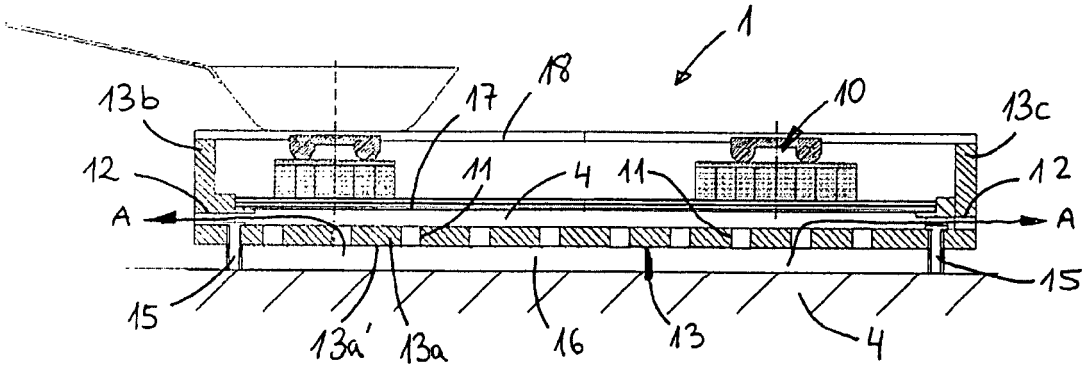
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Fig. 5

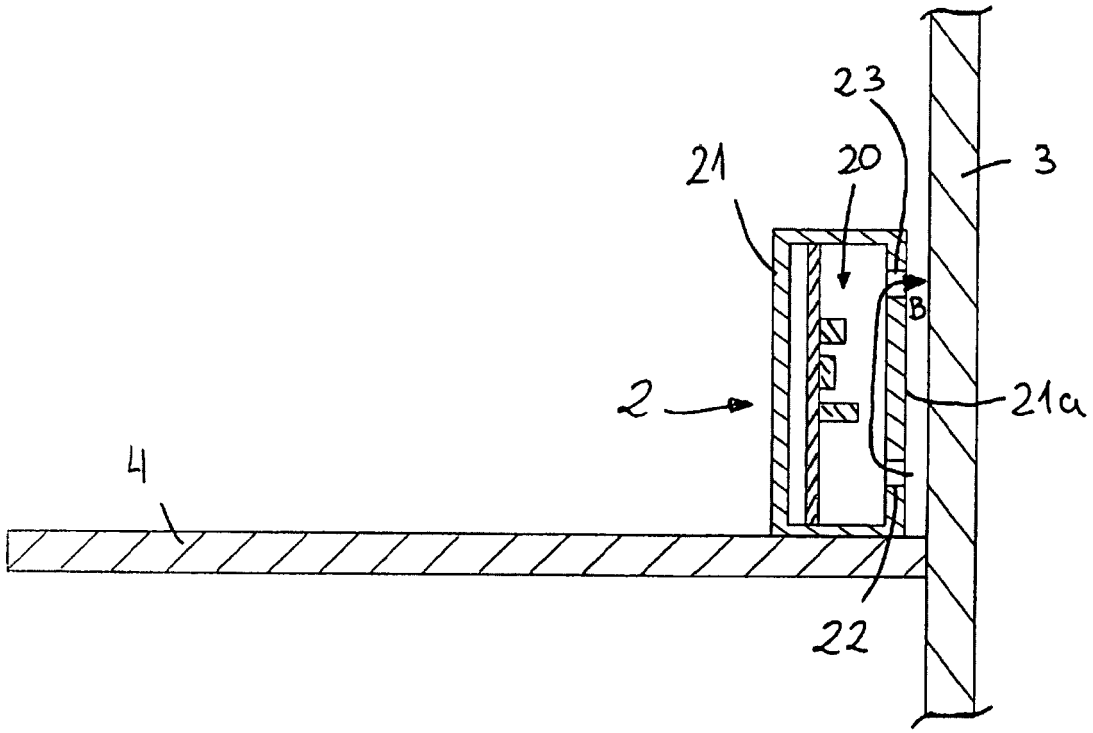
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Fig. 6

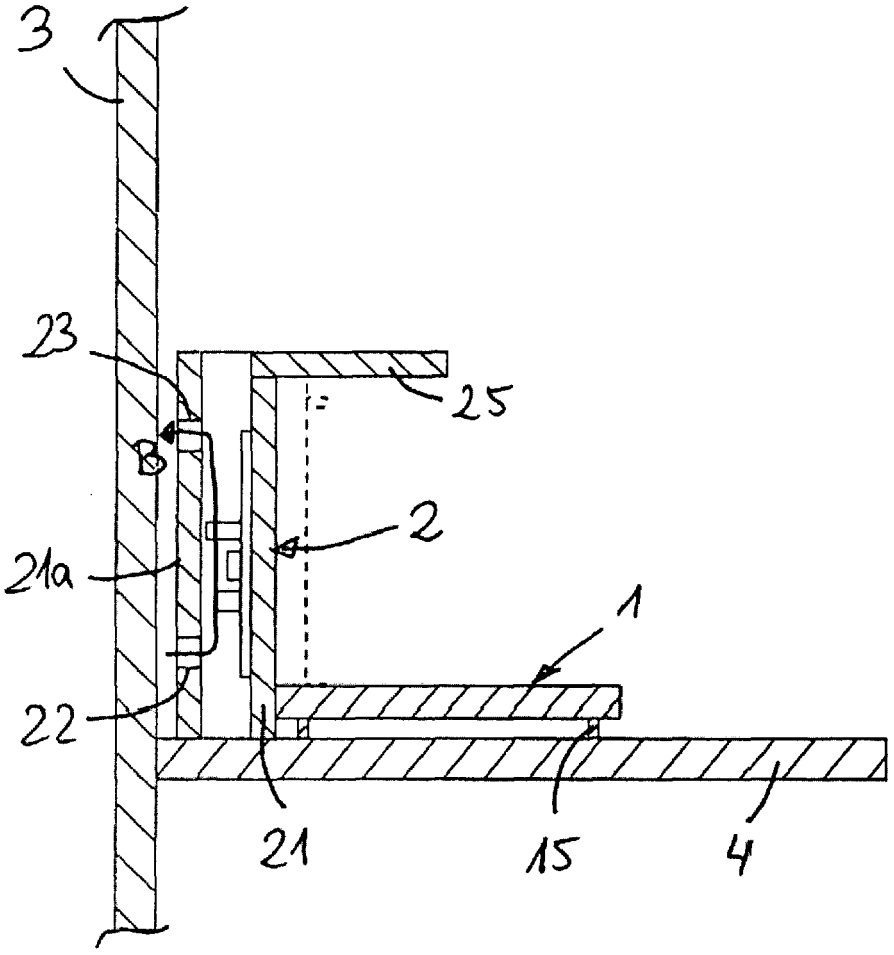

Fig. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 38 0219

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y,D	JP 06 215859 A (MATSUSHITA ELECTRIC IND CO LTD) 5 August 1994 (1994-08-05) * the whole document *	1-4,6-9, 12	INV. H05B6/12 F24C15/10
A		10	
Y	FR 2 635 852 A (SAMSUNG ELECTRONICS CO LTD [KR]) 2 March 1990 (1990-03-02) * figures 1,4,5 *	1,2,12	
Y	US 4 191 875 A (CUNNINGHAM RONALD J [US]) 4 March 1980 (1980-03-04) * figures 2,3 *	3,4	
Y	JP 06 327553 A (MATSUSHITA ELECTRIC IND CO LTD) 29 November 1994 (1994-11-29) * abstract; figures 1,3 *	6-9	
Y	EP 1 679 938 A (MATSUSHITA ELECTRIC IND CO LTD [JP]) 12 July 2006 (2006-07-12) * paragraph [0033] *	8	
A	US 4 468 548 A (YAMAKI MITSUO [JP]) 28 August 1984 (1984-08-28) * the whole document *	1,2,6	TECHNICAL FIELDS SEARCHED (IPC) H05B F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 January 2008	Tasiaux, Baudouin

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 38 0219

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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08-01-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 6215859 A	05-08-1994	NONE	
FR 2635852 A	02-03-1990	DE 3928572 A1	08-03-1990
		US 5019682 A	28-05-1991
US 4191875 A	04-03-1980	NONE	
JP 6327553 A	29-11-1994	NONE	
EP 1679938 A	12-07-2006	CN 1875662 A	06-12-2006
		WO 2005043958 A1	12-05-2005
		KR 20060064018 A	12-06-2006
		US 2007102420 A1	10-05-2007
US 4468548 A	28-08-1984	AU 538615 B2	23-08-1984
		AU 7968082 A	29-07-1982
		CA 1187561 A1	21-05-1985
		DE 3264155 D1	25-07-1985
		EP 0056974 A1	04-08-1982

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20060289489 A1 **[0003]**
- US 3740513 A **[0004]**
- FR 2340513 A1 **[0005]**
- JP 6215859 A **[0006]**