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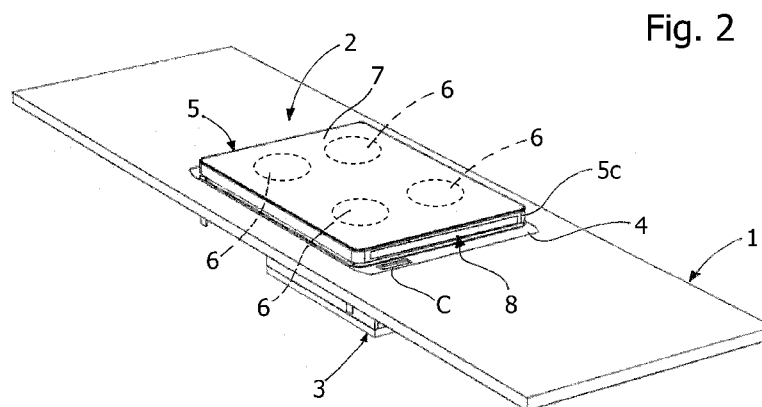
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(54) Title: HOUSEHOLD COOKING APPLIANCE



(57) Abstract: A household cooking appliance comprises a built-in cooking hob (2) having heating means (6) and a stationary supporting structure (3), provided for being at least partially built-in in an opening of a worktop (1) of a kitchen or the like. Mounted on the stationary structure (3) is a first movable structure (5), which supports first heating means (10) and is designed to assume a lowered position and a raised position with respect to the stationary structure (3). In the lowered position a top face (7) of the first movable structure (5) is substantially flush with respect to a top edge (4) of the stationary structure (3) or to the worktop (1), and in the raised position the top face (7) of the first movable structure (5) substantially projects with respect to the afore-said top edge (4) or to the worktop (1). Associated to the stationary structure (3) are actuator means, which can be controlled for causing a displacement in a substantially vertical direction of the first movable structure (5) between the lowered position and the raised position.





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“Household cooking appliance”**DESCRIPTION****Field of the invention**

5 The present invention relates to a household cooking appliance comprising, or consisting of, a cooking hob.

State of the art

 Cooking hobs for domestic use typically have a stationary supporting structure, which is at least partially housed in a corresponding opening of a kitchen
10 worktop.

 The dimensions in plan view of known cooking hobs are generally contained (typically 590 x 520 mm). If on the one hand, this enables reduction of the overall dimensions on the kitchen worktop, on the other hand it presents the drawback of determining a poor flexibility of use or limited cooking possibilities. For example,
15 heating of a container of large dimensions on a heating element of the cooking hob can render impossible simultaneous use of another heating element of the cooking hob.

 Also known are cooking hobs of larger dimensions (typically 690 x 520 mm), which are substantially immune to these drawbacks and envisage a greater number
20 of heating elements. These cooking hobs are, however, cumbersome so that their use is practically precluded in kitchens of small dimensions, or in kitchens the worktop of which must be occupied by other electrical household appliances of the built-in type or of the free-standing type.

 From EP-A-2 110 611, filed in the name of the present applicant, also known
25 is a cooking appliance basically consisting of a cooking hob and of a movable suspended assembly. In this solution the suspended assembly is mounted above a cooking hob and is able to assume with respect thereto at least one raised position and one lowered position so as to be able to provide hood functions and oven functions, respectively. The solution referred to in the aforesaid prior document is
30 particularly advantageous in terms of capacity of removal and disposal of cooking fumes and/or vapours generated in a domestic environment, and is convenient to use and versatile for a user, and in practice affords enhanced levels of operation.

 US-A-5928544, upon which the preamble of claim 1 is based, discloses a cooking appliance having a hob surface which is provided with a heating element in
35 the top surface of a base unit. The base unit is arranged to be capable of being

raised above the level of the hob surface, in order to expose a further heating element provided in the bottom surface of the base unit, whereby to permit food to be cooked with heat from above or below. The heating elements may be of gas or electrical. Also this solution presents however poor flexibility of use and limited cooking capabilities.

Summary of the invention

An aim of the present invention is to provide a cooking appliance comprising, or consisting of, a cooking hob of a new type, which enables the problems indicated above of the cooking hobs of a known type to be solved in an effective and efficient way. Another aim of the present invention is to provide a cooking appliance comprising one such cooking hob that affords high versatility of use. Yet a further aim of the invention is to provide a cooking appliance, comprising one such cooking hob and a suspended assembly that affords even further enhanced levels of operation as compared to the known art.

The above and yet further aim are achieved, according to the present invention, by a cooking appliance having the characteristics specified in the annexed claims. The claims form an integral part of the technical teaching provided herein in relation to the invention.

Brief description of the drawings

Further aims, characteristics, and advantages of the invention will emerge from the ensuing description and from the attached figures, which are provided purely by purpose of non-limiting example and in which:

- Figures 1, 2 and 3 are schematic perspective views of a kitchen worktop, installed on which is a cooking appliance according to one embodiment of the invention, in three different conditions;

- Figures 4 and 5 are schematic sections of a cooking appliance according to a possible embodiment of the invention;

- Figures 6 and 7 are schematic perspective views of a suspended element forming part of a cooking appliance according to a further possible embodiment of the invention; and

- Figures 8, 9, and 10 are schematic perspective views of a portion a generic environment household, wherein is installed a cooking appliance comprising a suspended element of the type illustrated in Figures 6 and 7.

Description of preferred embodiments of the invention

Reference to “*an embodiment*” or “*one embodiment*” in the framework of

this description is meant to indicate that a particular configuration, structure, or characteristic described in relation to the embodiment is comprised in at least one embodiment. Hence, phrases such as “*in an embodiment*” or “*in one embodiment*” and the like that may be present in different points of this description do not necessarily all refer to one and the same embodiment. In addition, the particular configurations, structures, or characteristics can be combined in any adequate way in one or more embodiments. The references used in what follows are only provided for convenience and do not define the sphere of protection or the scope of the embodiments.

10 In Figures 1 to 3, designated by 1 is a portion of kitchen worktop, for example a worktop belonging to a furniture resting on the floor (not represented). Installed on the worktop 1 is a built-in cooking hob 2, which, as will be seen hereinafter, provides or forms part of a cooking appliance according to the present invention. The cooking hob 2 is preferably of an electrical type and comprises heating means, preferably constituted by a plurality of heating elements.

Defined in the worktop 1 is a generally quadrangular through opening (not indicated), in which a stationary supporting structure 3 of the cooking hob 2 is at least partially built-in. The stationary structure 3 is secured at the aforesaid opening of the worktop 1 with fixing means of a known type.

20 The stationary structure 3 has overall dimensions in height larger than the thickness of the worktop 1, so as to be mounted passing through the aforesaid opening, extending in part underneath the worktop. Preferably, the stationary structure 3 includes a peripheral upper flange, designated by 4, having perimetral dimensions larger than those of the aforesaid through opening so as to be able to rest on the worktop 1.

According to a characteristic of the invention, mounted in a movable way on the stationary structure 3 is a first structure, designated as a whole by 5, which supports first heating elements, designated by 6, which are operative on an upper face 7 of the movable structure 5. The heating elements 6 may, for example, be constituted by a plurality of resistors or electric hot plates, set underneath a plate made of glass or glass-ceramic material, or other suitable material, which thus provides the aforesaid upper face 7. In other embodiments, the heating means 5 can consist of one or more electric hot plates or resistors (for example made of cast iron), mounted exposed on an upper plate of the movable structure 5, or else again one or more induction heating elements, mounted underneath an upper plate

of the movable structure 5, for example made of glass-ceramic or else glass. It may be noted that the heating elements 6 provided on the movable structure 5 could also comprise gas burners.

Once again according to the invention, the movable structure 5 is designed to
5 assume a lowered position and a raised position, with respect to the stationary structure 3, said positions being visible in Figures 1 and 2, respectively. In the lowered position, the upper face 7 of the movable structure 5 is preferably substantially flush, or else projecting upwards, to a first extent, with respect to the flange 4 or to the worktop 1. In the raised position, the upper face 7, instead,
10 substantially projects upwards, or else projects to a greater extent than in the previous case, with respect to the flange 4 or to the worktop 1, as is clearly visible from a comparison between Figure 1 and Figure 2. The travel in raising/lowering can be indicatively comprised between approximately 3 cm and approximately 8 cm.

15 Once again according to the invention, the cooking hob 2 is provided with actuator means, in particular supported by the stationary structure 3, which can be controlled or actuated to bring about displacement of the movable structure 5 in a substantially vertical direction, i.e., a direction substantially perpendicular to the worktop 1, between the aforesaid lowered position and raised position.

20 In a preferential particularly advantageous embodiment of the invention, mounted on the movable structure 5 of the cooking hob 2 is a second movable structure (partially visible in Figure 2, where it is designated by 8), which supports respective second heating means, in particular heating means of an electrical type. As may be seen in Figure 3, this second movable structure 8 is designed to assume
25 a retracted position and a position that is at least partially extracted with respect to the first movable structure 5. In particular, as may be seen from a comparison between Figure 2 and Figure 3, the second movable structure 8 can be extracted laterally from the first movable structure 5, when the latter is in its raised position; namely, it can be extracted in a direction that is substantially perpendicular to the
30 direction of movement of the movable structure 5 between the respective raised and lowered positions.

The movable structure 8 can be extracted from the movable structure 5 in order to render accessible a respective upper face 9, where the respective second heating means, designated by 10, are operative. The heating means 10 can for
35 example comprise one or more heating elements of the same type as the one

previously indicated in relation to the heating elements 6. In a preferred embodiment, the heating elements 10 of the movable structure 8 are of an induction type.

5 Illustrated merely by way of example in Figures 4 and 5 is a possible configuration of the cooking hob 2, with the movable structure 5 in the raised position and lowered position, respectively. Figures 4 and 5 are merely schematic cross sections, according to a plane perpendicular to the direction of extraction of the movable structure 8.

10 In the example provided, the stationary structure 3 is substantially box-shaped, open at the top and provided with the top flange 4, designed for resting on the worktop 1. Preferably, but not necessarily, the flange 4 is designed to be mounted substantially flush with respect to the top surface of the worktop 1 where it installed.

15 As may be seen, in the embodiment illustrated, the stationary structure 3 has a bottom wall 3a, which supports actuator means, here represented by a plurality of electrically controllable linear actuators 11, mounted in corresponding housings or supports 12 rendered fixed to, or formed integral with, the bottom wall 3a. For this purpose, provided in the bottom wall 3a are holes for the passage of drive shafts 11a of the actuators 11, the top ends of these shafts 11a bearing upon, or being
20 fixed with respect to, a bottom wall 5a of the movable structure 5.

The actuators 11 are preferably linear electrical actuators, for example screw actuators or thermo-actuators, but not excluded from the scope of the invention is the use of pneumatic or hydraulic actuators, also of a telescopic type. It should be pointed out that the actuator means 11 could be supported by the structure of the
25 cabinet to which the worktop 1 belongs, instead of being carried by the stationary structure 3.

In order to guarantee a precise movement of the movable structure 5, this is preferably slidably constrained to the stationary structure 3: for this purpose, between mutually facing side walls of the structures 3 and 5 there can be
30 conveniently provided linear guides (not represented in the figures), of any type designed for the purpose (for example, ones comprising wheels, balls, antifriction materials, etc.).

In the example of Figures 4 and 5, the movable structure 5 is as a whole box-shaped, with an upper part positioned on which are the heating elements 6 (not
35 shown). In the example, this part is closed on top by a plate (not indicated), for

example made of glass-ceramic, which provides the face 7; mounted underneath said plate are the heating elements, for example housed in a corresponding box 5b, possibly provided with heat-insulating material, if necessary.

5 The movable structure 5 has then a lower part, present in which is a space for housing the second movable structure 8, in said lower part there being provided, on a side face of the structure 5, an opening for extraction of said movable structure 8: this side face is designated by 5c in Figures 2 and 3.

10 In the example illustrated, also the second movable structure 8 is as a whole box-shaped, closed on top by a plate (not indicated), which provides the face 9, for example a plate made of glass-ceramic. Mounted underneath said plate are the heating elements 9, not represented Figures 4 and Figure 5 either, which are for example housed in a corresponding box 8a, possibly provided with heat-insulating material, if necessary.

15 In order to enable displacements between the retracted position and the extracted position, the second movable structure 8 is slidably coupled to the first movable structure 5, via guide means. Also said guide means can be of any known type suited to the purpose. In the embodiment exemplified, rolling guide means are used, which include upper rollers or wheels 13 and lower rollers or wheels 14. In one such embodiment, the wheels 13 and 14 are mounted on the movable structure 20 5 in opposed positions so that the structure 8 is linearly movable between them, in a constrained way. Obviously, it is also possible to envisage side guide wheels.

In an alternative embodiment, the upper wheels 13 are mounted on the movable structure 5, whilst the lower wheels 14 are mounted in the lower part of the movable structure 8 in order to be able to operate on guide surfaces defined 25 within the structure 5. In one such embodiment, advantageously, at least some of the wheels 14 are also able to co-operate with the worktop 1 when the second movable structure 8 is displaced between the respective retracted position and extracted position: in this way, the wheels 14 enable support of the movable structure 5 resting on the worktop 1, in the extracted position, also guaranteeing 30 parallelism thereof with respect to the surface of the worktop itself. In addition or as an alternative to the wheels 14, the guide means can comprise, for example, ball guide systems, antifriction blocks, etc.

35 In one embodiment, the cooking hob 2 comprises a system for servo-displacement of the second movable structure 8 at least from its retracted position to its extracted position. This system for servo-displacement may possibly

comprise respective actuator means that can be controlled electrically, even though an embodiment of this sort complicates to a certain extent production of the cooking hob 1. For this reason, in an embodiment at the moment deemed preferential, the aforesaid system for servo-displacement includes elastic means, operative for forcing the second movable structure 8 towards the respective extracted position, and at least one stop mechanism, preferably but not necessarily of a push-push type, which can be switched manually by a user between a locked condition and a released condition. These elastic means and the stop mechanism are not represented in the figures in so far as they can be provided according to techniques in themselves known.

For example, the elastic means can comprise at least one spiral spring, having one end rendered fixed with respect to the inner side of the structure 5 opposite to the face 5c (Figures 2 and 3), the other end of the spring facing the face of the structure 8 that constantly remains within the movable structure 5. In the locking condition of the aforesaid stop mechanism, which is obtained when the movable structure 8 is in the retracted position, the spring is compressed by the structure 8 itself, with the latter that is withheld within the structure 5 countering the action of said spring. Upon passage of the mechanism into its released condition, the structure 8 is no longer withheld and can hence shift automatically at least in part towards its extracted position, thanks to the elastic reaction of the spring. The extraction of the movable structure 8 can then be completed manually by a user, by simply pulling the structure 8 towards the outside of the structure 5. Obviously, preferably provided between the structures 5 and 8, as likewise between the structures 3 and 5, are suitable end-of-travel means.

The switchable stop mechanism may, as has been said, be a mechanism of a push-push kind, of any known type suited to the purpose, i.e., a mechanism which can be switched between the respective conditions of locking and release via a manual pressure exerted directly on the second movable structure 8, in a direction opposite to its direction of extraction, to overcome slightly the force of the spring or of the springs used.

Extending in part within the stationary structure 3 are insulated electrical conductors coming from outside, for supply and/or control of the various heating elements 6, 10 of the cooking hob 2, it being possible for part of said conductors to extend also within the movable structure 5, for supply and/or control of the heating means 10 for heating the movable structure 8. Preferably, associated to said

conductors are cable guides of a known kind, for example of the type comprising return springs, for guaranteeing correct positioning of the conductors themselves during the displacements of the structures 5 and 8. Said conductors and cable guides (like the conductors for supply/control of the actuators 11) have not been represented for reasons of simplicity in the figures. It should also be considered that Figures 4 and 5 are provided merely by way of example and that, consequently, for instance with reference to Figure 5, the space existing between the bottom walls 3a and 5a of the structures 3 and 5 may be in actual fact greater than what is represented to enable housing of part of the aforesaid conductors and of the possible cable guides.

It should moreover be pointed out that the cooking hob 2 has a respective control system, for example of an electronic type, which comprises at least one user interface, for control of the heating elements 6 and 10 and for control of the actuators 11. The control system is preferably configured in such a way that the operation of the actuators 11 is not enabled when the structure 8 is in its extracted position, for example envisaging a microswitch designed to detect the completely retracted position of the movable structure 8. In a simpler embodiment, exemplified in Figures 1-3, actuation of the actuators 11 can be controlled via a dedicated control means, such as a switch, designated by C, which is set on the flange part 4 that extends along the side face 5c of the structure 5. As may be readily understood from Figure 3, with said arrangement, the aforesaid control means C is practically inaccessible to the user when the structure 8 is extracted, thus preventing the actuators 11 from possibly being governed accidentally. In order to be able to bring about return of the movable structure 5 into the respective lowered position, it is hence necessary to bring the movable structure 8 into the respective completely retracted position.

The control means of the cooking hob 2 (not represented) can comprise a single user interface, or else two distinct user interfaces, for control of the heating means 6 and 10 of the structure 5 and 8, respectively. In one embodiment, for example, the interface, or each interface, comprises a region of the plate that defines the upper face 7, 10 of the structures 5 and 8. In this embodiment, control elements of a capacitive or touch-sensitive type can be used, mounted underneath the plate itself. In one embodiment, particularly indicated in the case of use of a single user interface for governing all the heating elements 6 and 10, the cooking hob 2 has safety means, designed to inhibit supply of the second heating means 10

when the second movable structure 8 is in the respective retracted position. These safety means can comprise, for example, a microswitch, which can be switched for opening the circuit for supplying the heating elements 10 when the structure 8 is in its retracted position.

5 As emerges from what has been described previously, the cooking hob 2 constituting the appliance according to the invention offers a considerable flexibility of use for a user, as well as increased cooking possibilities, in terms of number of heating elements available, and hence of containers that can be heated simultaneously. In effect, the second movable structure 8 provides an auxiliary
10 cooking hob with respect to the main cooking hob represented by the first movable structure 5. It should be highlighted that these functions can be obtained with a cooking hob that is in any case compact, i.e., that – in the operating condition of Figure 1 – presents in any case contained occupation of area of the kitchen worktop, having substantially the same overall dimensions as traditional cooking
15 hobs.

In one embodiment, the cooking appliance according to the invention includes, in addition to the cooking hob 2 described previously, a suspended assembly, configured for performing functions of hood and, in combination with the cooking hob 2, functions of oven. A suspended assembly that can be used in an
20 embodiment of this sort is, for example, the one described in the document No. EP-A-2 110 611, filed in the name of the present applicant.

Figures 6-10 are schematic illustrations of a further example of combination of a cooking hob 2 with a suspended assembly.

Figures 6 and 7 illustrate a movable suspended element, designated as a
25 whole by 20, belonging to the aforesaid assembly and comprising a casing 21, defined within which is a cavity 22, having a front opening 23 and a lower opening 24. Preferably, the casing 20 surrounds a muffle (not represented for reasons of simplicity), the latter defining at least part of the cavity 22 and also having corresponding front and lower openings. Hence, in what follows, by the term
30 “casing” is meant both the external structure or casing 21 of the suspended element and the corresponding muffle.

Set at the front part of the casing 20 is a door 25, which is preferably at least in part transparent. In the example represented, the door 25 is mounted with respect to the casing 20 so as to turn about a substantially horizontal axis and to
35 displace at the same time upwards, from the closed position (Figure 6) to the open

position (Figure 7), with a roto-translatory movement. For this purpose known parallelogram hinges can be used. Preferably, operative between the door 25 and the front of the casing 21 are sealing means, of a type in itself known.

Preferably mounted within the casing 21 of the suspended element 20 are means for heating the cavity or cooking chamber 22, and the suspended element 20 can also be possibly provided with means for producing a forced circulation or movement of the air within the cavity 22, when this is used for cooking purposes. For possible embodiments and modes of positioning of the aforesaid means for heating and forced movement of the air reference may be made to the
10 aforementioned EP-A-2 110 611.

Once again in a way similar to what described in EP-A-2 110 611, the suspended assembly has supporting means for the element 20, provided to enable displacement of the element itself between a respective raised position and a respective lowered position with respect to the cooking hob 2. In Figures 8-10
15 these guide means are exemplified in the form of parallel linear guides 30, only shown schematically, made in a wall P provided with fixtures of the environment where the assembly is installed, and coupled to which are guide means associated to the rear wall of the casing 21.

The displacement of the suspended element 20 between its lowered position and its raised position can be manual or, preferably, motor driven, in which case the supporting means comprise a controllable actuation arrangement, preferably comprising an electric motor. The motor can be controllable, as in the example provided here, to obtain positioning of the suspended element 20 not only in a completely raised position (Figure 8) and in a completely lowered position (Figure
20 10), but also in an intermediate position between the raised position and the lowered position (Figure 9), according to the requirements of use. The possible uses of the suspended element 20, in the various positions mentioned, can be similar to those described in EP-A-2 110 611.

As may be readily understood from Figure 8, in the completely raised position of the suspended element 20, the lower opening 24 (Figure 7) of its cavity 22 is set at a distance from the upper face 7 of the first movable structure 5 of the cooking hob 2. Instead, in the completely lowered position of the suspended element 20, the lower opening 24 is substantially closed by means of the upper face 7 of the movable structure 5. Hence, it will be appreciated that the cooking hob 2
25 30 is installed underneath the suspended element 20, with the lower opening 24 of the

cavity 22 that is substantially aligned or centred with respect to the first movable structure 5 of the cooking hob 2.

Preferably, and as may be readily understood from Figure 10, the perimetral dimensions of the lower opening 24 of the suspended element 20 and those of the movable structure 5 of the cooking hob 2 are such that, with said movable structure 5 in the respective raised position and the suspended element 20 in the respective lowered position, an upper portion of said movable structure 5 is located inside or else projects into the cavity 22 of the suspended element 20.

Said solution enables a precise coupling and positioning between the two functional components 2 and 20 of the cooking appliance to be obtained, when it is used in the “oven” mode, with minimized dispersions of heat. This solution eliminates also the need to provide sealing means along the lower edge of the casing 21, which are subject to wear.

When the suspended element 20 is in the lowered position of Figure 10, one or more heating elements 6 of the cooking hob 2 can be used for heating the cavity 22 from beneath; instead, when the suspended element 20 is in a raised position, it can perform functions of suction or filtering hood, with the cooking hob 2 used for heating one or more containers with food being cooked.

Once again with reference to Figure 10, it may be noted that, with the first movable structure 5 of the cooking hob 2 in the respective raised position and with the suspended element 20 in the respective lowered position, at least one portion of the face 5c of the movable structure 5 remains in any case exposed with respect to the casing 21 of the element 20 to enable in any case passage of the second movable structure 8 of the cooking hob 2 between the respective retracted position and extracted position.

It will be appreciated then that, also when the cooking hob 2 is used, together with the suspended element 20, in an “oven” mode, the second movable structure 8 can in any case be brought into the corresponding extracted position to enable use of the heating elements 10 in order to carry out other cooking operations, outside the cavity 22 of the suspended element 20.

The suspended assembly is provided with a corresponding control system, preferably of an electronic type: for possible examples of functions associated to such a control system reference may be made to EP-A-2 110 611.

In one embodiment, associated to the suspended element 20 are a first user interface and a second user interface, for control of its function as hood and as

oven, respectively. These two interfaces are designated by 31 and 32 in Figures 8-10 and are positioned on the door 25, respectively in a lower region and an upper region thereof. The control system of the suspended assembly can include switchable means for enabling or otherwise operation of the first and second interfaces 31, 32 according to the position of the suspended element 20 between the positions that it can assume. For example, these means can comprise a microswitch, which is switched for closing a circuit of the interface 32 and for opening a circuit of the interface 31 when the suspended element 20 is in the position of Figure 10 so as to enable only the interface 32 for controlling the oven function. It will be appreciated that, in the position of Figure 10, the interface 32 is in a position favourable from the ergonomic standpoint for a user. Instead, when the suspended element 20 is brought towards the raised position (Figure 8) or the intermediate position (Figure 9), the aforesaid microswitch switches in a way reverse to the previous one, enabling only the lower user interface 31 for controlling of hood function: in this case, following upon displacement of the suspended element 20 upwards, it is in fact the interface 31 that is in a position more favourable for the ergonomic standpoint for the user.

The suspended assembly 20 can be provided with an arrangement for evacuation of fumes similar to the one described in EP-A-2 110 611, i.e., with a discharge channel that is movable or able to undergo variation of configuration during displacement of the suspended element.

Figures 8-10 illustrate a possible alternative embodiment, in which a stationary channel 33 is provided, made in the wall P provided with fixtures, between the guides 30, which extends behind the casing 21 of the suspended element 20. This channel 33 is in communication with the inlet of a suction unit (not represented) and has a plurality of inlet openings, designated by 34, 35 and 36, at different heights, corresponding to the positions that can be assumed by the suspended element 20.

The casing 20 has a rear fume outlet (not visible) which is in fluid communication with the cavity 22. Conveniently associated to this rear outlet is a sealing element, for example in the form of tubular bellows-type gasket, having one end that surrounds the fume outlet and is fixed to the rear wall of the casing 20, the opposite end being, instead, slidable on the front surface of the channel 33. This second end of the aforesaid sealing element comes to occupy an area corresponding to the openings 34, 35 or 36 according to the position of the

suspended element 20, for setting the fume outlet in fluid communication with the inside of the channel 33.

In this embodiment, moreover, each inlet opening 34, 35, 36 has a respective shutter 34a, 35a, 36a, normally closed, which is switched into the opening
5 condition when the rear fume outlet, i.e., the corresponding sealing element, is set in a position corresponding to the inlet opening, i.e., in one of the predefined positions of the suspended element 20. Opening of the shutter can be governed by the control system of the suspended assembly and be obtained by means of
10 actuators associated to the channel 33, or else by means of a single actuator set in a position corresponding to the rear wall of the casing 21 of the suspended element 20 (for example, an actuator with a spindle designed to push the shutter 34a, 35a, 36a into the opening condition, said actuator being actuated when the element 20 is in the position corresponding to the shutter that is to be opened).

In one embodiment, the casing 21 of the suspended element 20 has an
15 opening for intake of fumes and/or vapours, designated by 40 in Figures 6-10, in a side wall 21a corresponding to the side face 5c of the first movable structure 5 of the cooking hob 2, i.e., the side face from which the second movable structure 8 can be extracted. In this way, when the second movable structure 8 is in the respective extracted position, the intake opening 40 is in a higher position with
20 respect to the upper face 9 of the second movable structure 8. When the movable structure 8 is extracted and set on one of the heating elements 10 is a container containing food being cooked, the corresponding fumes and/or vapours and/or odours can be drawn in through the side opening 40, which is in fluid communication with the discharge channel connected to the element 20, whether
25 this be of the type described in EP-A-2 110 611 or of the type designated by 33 in Figures 8-10. Of course, the suction effect is maximized when the suspended assembly 20 is in the lowered position of Figure 10.

Also the intake opening 40 is preferably provided with a shutter, represented schematically and designated by 41, which can be switched between an open
30 position and a closed position via actuator means carried by the suspended element 20. In this embodiment, the control systems of the cooking hob 2 and of the suspended element 20 are preferably provided for interacting with one another so that the aforesaid actuator means will be driven automatically to bring about opening of the shutter 41 only when the movable structure 8 is extracted and at
35 least one of its heating elements is active. On the other hand, it is also possible to

envisage a purposely provided control means on one of the user interfaces 31, 32 of the suspended element, so that it will be the user who governs opening of the shutter 41 directly, when deemed necessary.

5 It is clear that numerous variations may be made by the person skilled in the art to the cooking appliance described by way of example, without thereby departing from the scope of the invention as defined in the annexed claims.

10 The invention has been described previously with reference to use of actuator means that can be governed via electrical signals (whether these be electric, hydraulic or pneumatic actuators) in order to produce an assisted displacement of the movable structure 5 of the cooking hob 2 between the lowered position and the raised position. In an alternative embodiment, a purely mechanical system for assisted raising can be provided, also in this case comprising elastic means that tend to push the movable structure 5 upwards, as well as a corresponding manually switchable stop mechanism, for example but not necessarily of a push-push type, 15 i.e., with an arrangement conceptually similar to the one described previously with reference to the movable structure 8. In this case, the passage of the movable structure 5 from the raised position to the lowered position is performed manually, simply by pushing the structure 5 downwards, until engagement of the arrest mechanism is produced.

20 As already mentioned, the systems for controlling the cooking hob 2 and the suspended assembly, which are preferably of an electronic type, can be conveniently pre-arranged for interacting with one another, by means of a radiofrequency or wired connection, for example in such a way that switching-on of one of the heating elements 6 and/or 10 of the cooking hob 2 determines also 25 activation of the aforesaid suction unit and of the possible further actuators connected to the system of evacuation of the fumes/vapours/odours. As already referred to in EP-A-2 110 611, it is also possible to envisage a single or centralized control system, for managing the functions of the suspended assembly and of the cooking hob, possibly with a single user interface or control panel.

30 The invention has been described with reference to a electric cooking hob but the idea underlying the invention may evidently be applied also to the case of cooking hobs with gas burners. In said perspective, the movable structure 5 can be provided with gas burners, for example, but not necessarily, under-top burners, and the movable structure can be provided with electric heating elements, in particular 35 of an induction type.

The cooking hob described, instead of being built-in, could be provided for being installed in a top opening or seat of a free-standing cooking appliance.

CLAIMS

1. A household cooking appliance comprising, or consisting of, a cooking hob
(2) having heating means (6, 10), particularly electric-type heating means, the
5 cooking hob (2) having a stationary support structure (3), designed to be at least
partly built-in in an opening of a worktop (1) of a kitchen or the like, wherein a
first movable structure (5) is mounted on the stationary structure (3), which
supports first heating means (6), the first heating means (6) being operative at an
upper face (7) of the first movable structure (5), the first movable structure (5)
10 being adapted to assume a lowered position and a raised position relative to the
stationary structure (3), in the lowered position the upper face (7) of the first
movable structure (5) being substantially flush, or protruding to a first extent, with
respect to an upper edge (4) of the stationary structure (3) or to the worktop (1),
and in the raised position the upper face (7) of the first movable structure (5)
15 substantially protruding, or protruding to a second extent, with respect to the said
upper edge (4) of the stationary structure (3) or to the worktop (1), and wherein
the cooking hob (2) has actuator means (11), particularly supported by the
stationary structure (3), controllable or switchable for causing a displacement in a
substantially vertical direction of the first movable structure (5), between the
20 lowered position and the raised position,

characterized in that a second movable structure (8) is mounted on the first
movable structure (5), which supports second heating means (10), particularly
electric-type heating means, the second heating means (10) being operative at an
upper face (9) of the second movable structure (8), the second movable structure
25 (8) being adapted to assume a retracted position and an extracted position relative
to the first movable structure (5), the second movable structure (8) being
extractable laterally from the first movable structure (5) for making the respective
upper face (9) accessible, when the first movable structure (5) is in the said raised
position.

30 2. The household cooking appliance according to claim 1, further comprising
a suspended assembly, having:

- a movable suspended element (20), configured for carrying out hood
functions and, in conjunction with the cooking hob (2), oven functions, the
suspended element (20) comprising a casing (21), within a cavity (22) is defined,
35 having at least one lower opening (24), the lower opening (24) of the cavity (22)

being substantially aligned or centred with respect to the first movable structure (5) of the cooking hob (2);

- support means (30), prearranged such that the suspended element (20) is able to be displaced between a respective raised position and a respective lowered position relative to the cooking hob (2), in the raised position of the suspended element (20) the lower opening (24) of the cavity (22) being spaced apart from the upper face (7) of the first movable structure (5) of the cooking hob (2), and in the lowered position of the suspended element (20) the lower opening (24) of the cavity (22) being substantially closed by means of the first movable structure (5) of the cooking hob (2).

3. The household cooking appliance according to claim 2, wherein, with the first movable structure (5) of the cooking hob (2) in the respective raised position and the suspended element (20) in the respective lowered position, a top portion of the first movable structure (5) is inserted within the cavity (24) of the suspended element (20).

4. The household cooking appliance according to claim 3, wherein, with the first movable structure (5) of the cooking hob (2) in the respective raised position and the suspended element (20) in the respective lowered position, at least one portion of a side face (5c) of the first movable structure (5) is exposed with respect to the casing (21) of the suspended element (20) to enable passage of the second movable structure (8) between the respective retracted position and extracted position.

5. The household cooking appliance according to claim 1, wherein the first movable structure (5) of the cooking hob (2) is slidably constrained to the stationary structure (3) for displacement between the respective lowered position and raised position.

6. The household cooking appliance according to claim 1, wherein the second movable structure (8) of the cooking hob (8) is slidably coupled with the first movable structure (5) by guide means (13, 14).

7. The household cooking appliance according to claim 1, wherein the second movable structure (8) has guide and/or support means (14), in particular of a rolling type, which are able to co-operate with the worktop (1) when the second movable structure (8) is displaced between the respective retracted position and extracted position for supporting the second movable structure (8) so that it rests on the worktop.

8. The household cooking appliance according to any one of the preceding claims, wherein the stationary structure (3) of the cooking hob (2) is substantially box-shaped, open at the top and having a bottom (3a) that supports said actuation means (11).

5 9. The household cooking appliance according to any one of the preceding claims, wherein the first movable structure (5) is substantially box-shaped, with an upper part wherein the first heating means (6) are positioned and a lower part wherein there is a space for housing the second movable structure (8), said lower part having a side opening for extraction of the second movable structure (8) from
10 the first movable structure (5).

10 10. The household cooking appliance according to claim 1, wherein the cooking hob (2) comprises a system for the servo-displacement of the second movable structure (8) at least from its retracted position to its extracted position.

15 11. The household cooking appliance according to claim 10, wherein the system for the servo-displacement includes elastic means, for biasing the second movable structure (8) towards the respective extracted position, and at least one manually switchable stop mechanism, which in a respective locking condition is operative for keeping the second movable structure (8) in the retracted position thereof, and in a respective released condition enables an at least partial passage of
20 the second movable structure (8) in extracted position thereof under the action of the aforesaid elastic means, the stop mechanism being preferably of the push-push type, i.e., switchable between the respective conditions of locking and release by means of a manual pressure on the second movable structure (8) in a direction opposite to the direction of extraction.

25 12. The household cooking appliance according to any one of the preceding claims, wherein the suspended element (20) has one first user interface (31) and one second user interface (32), for controlling hood functions and oven functions of the suspended element (20), the suspended assembly also having means for enabling or disabling operation of the first and the second user interfaces (31, 32)
30 depending upon the position of the suspended element (20) between the respective raised and lowered position.

35 13. The household cooking appliance according to claim 2, wherein the casing (21) of the suspended element (20) has an intake opening (40) for fumes and/or vapours and/or odours, provided with a shutter (41) switchable between a closed position and an open position, the intake opening (40) being at a side wall

(21a) of the casing (21) corresponding to a side face (5c) of the first movable structure (5) from which the second movable structure (8) can be extracted, such that, when the second movable structure (8) is in the respective extracted position, the intake opening (40) is in a position above the upper face (9) of the second movable structure (8).

14. The household cooking appliance according to claim 2, wherein:

- the suspended assembly comprises a stationary channel (33), extending vertically at the back of the casing (21) of the suspended element (20), the channel (33) being in fluid communication with the inlet of a suction unit and having a plurality of inlet openings (34, 35, 36) at different heights, among which at least one first opening (34) and one second opening (36);

- the casing (21) of the suspended element (20) has a rear outlet, which is in fluid communication with the corresponding cavity (22), the rear outlet being at the first inlet opening (34) or the second inlet opening (36) when the suspended element (20) is in the lowered position or in the raised position, respectively;

- each inlet opening (34, 36) has normally closed closing means (34a, 36a), which are switchable for opening when the rear outlet of the casing (21) is set in a position corresponding to a corresponding said inlet opening (34, 36).

Fig. 1

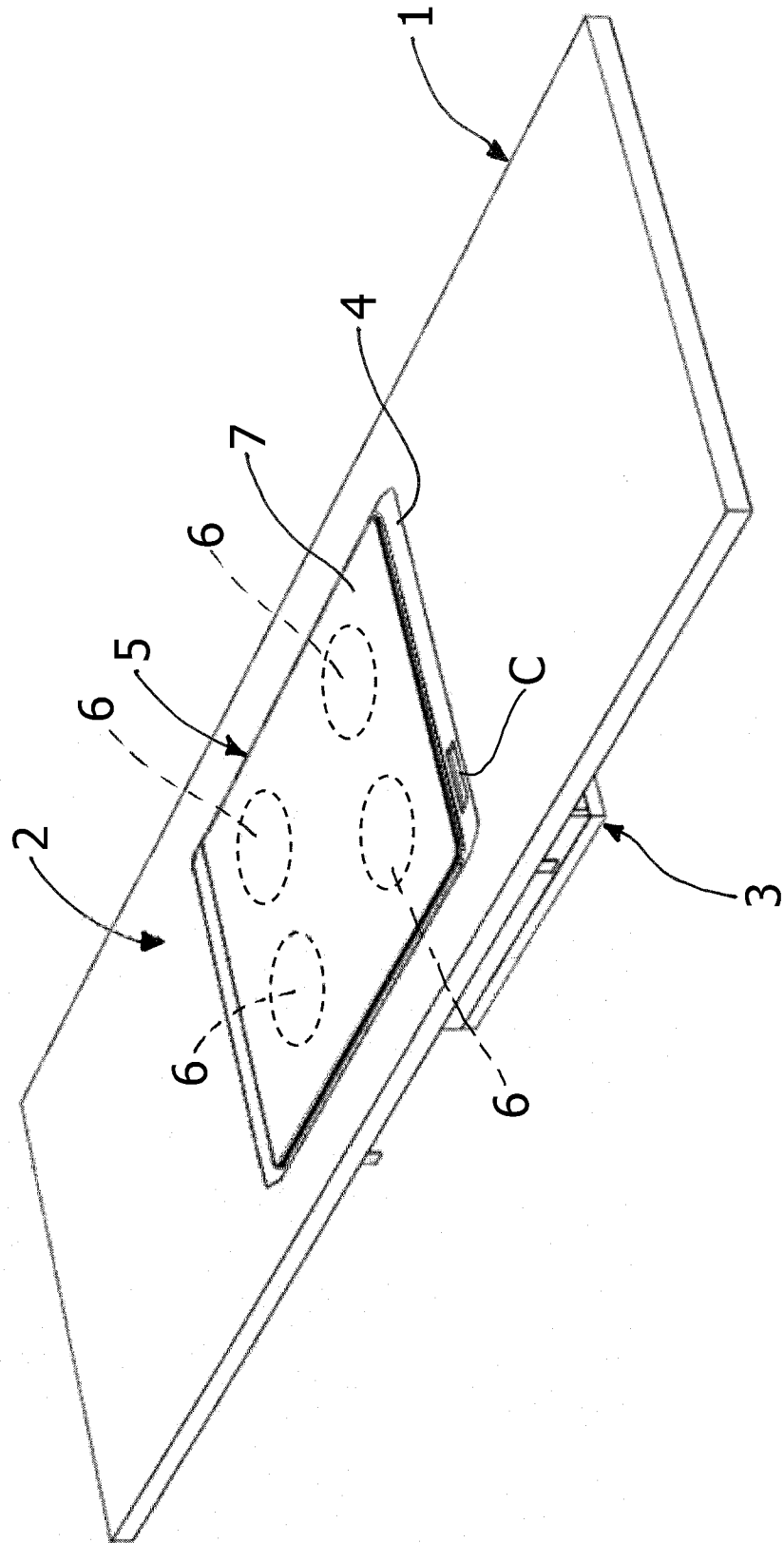


Fig. 2

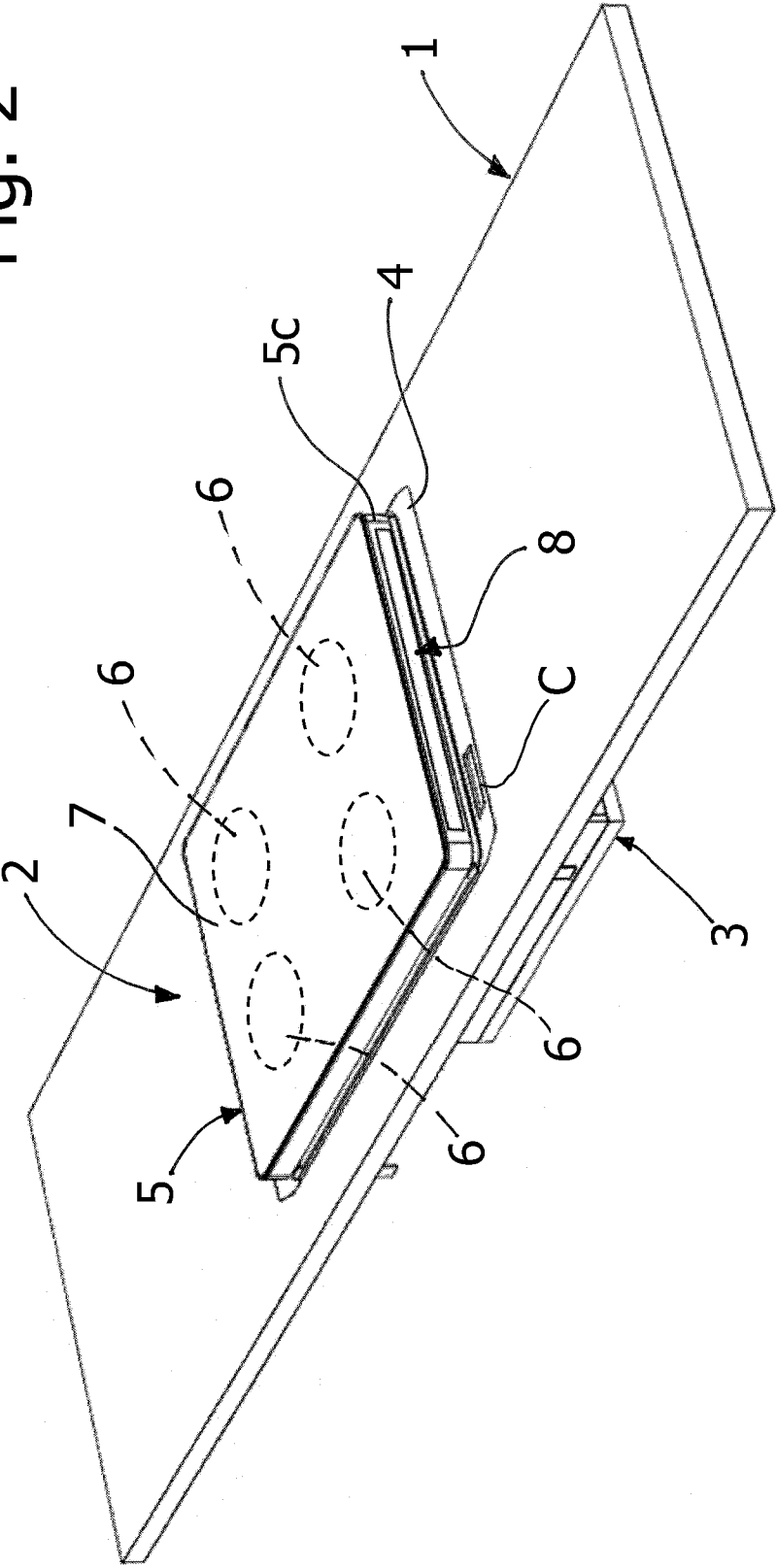
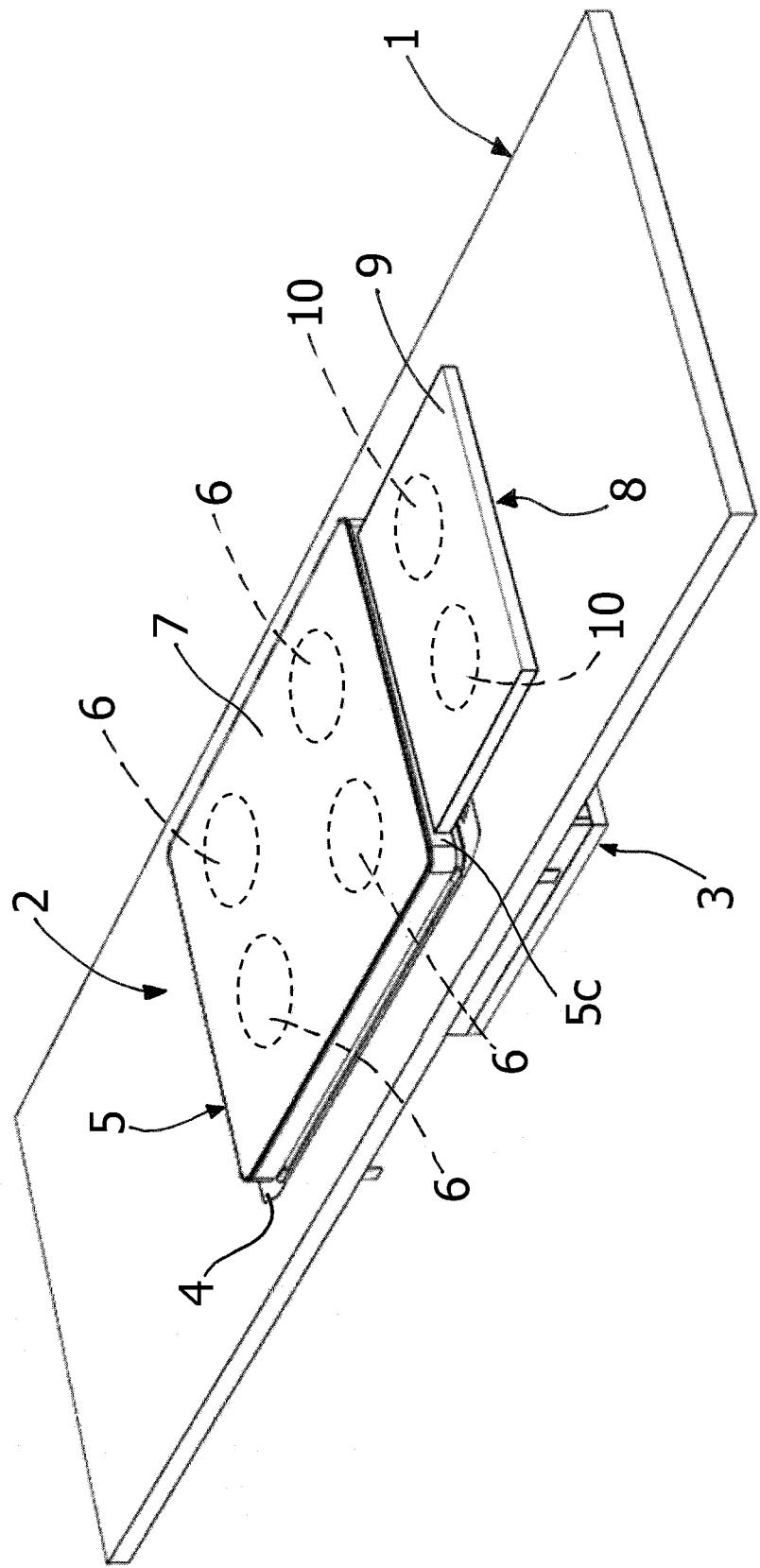


Fig. 3



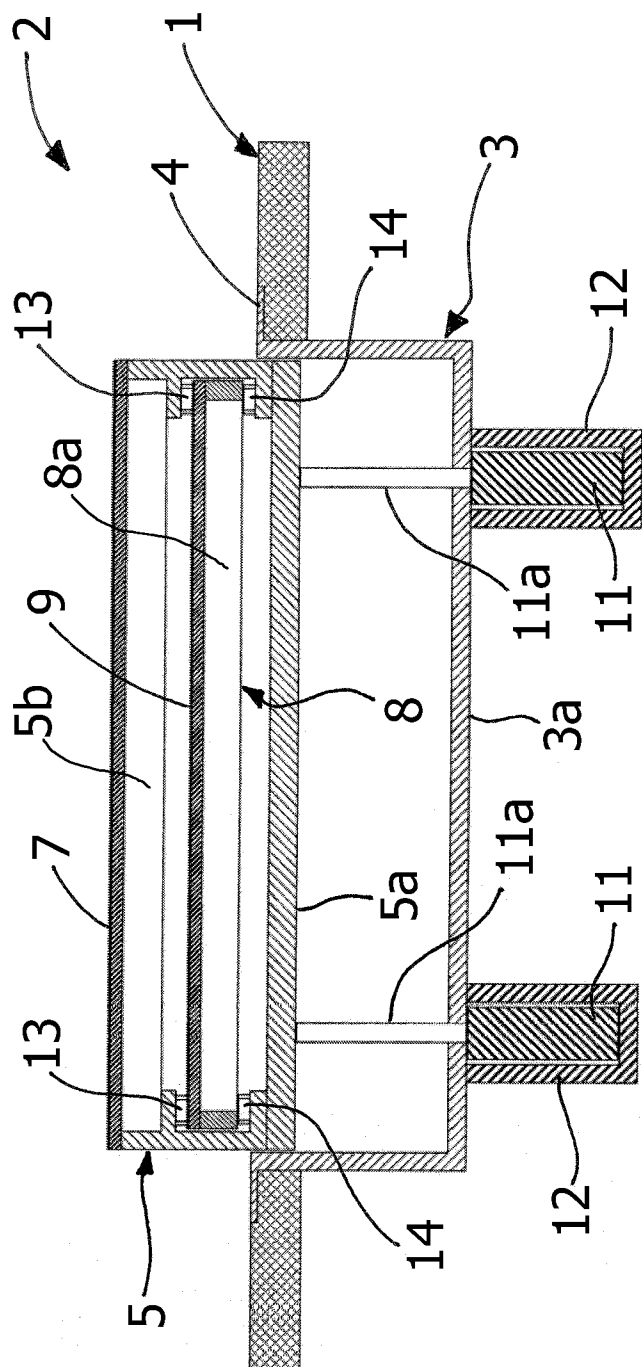


Fig. 4

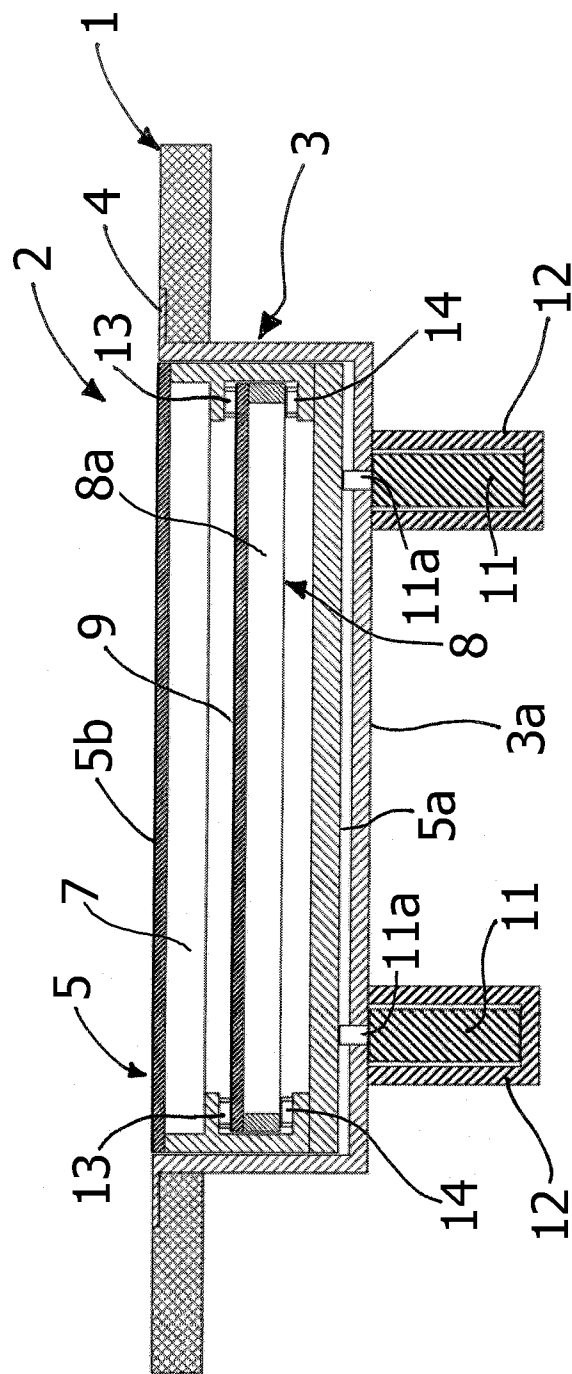
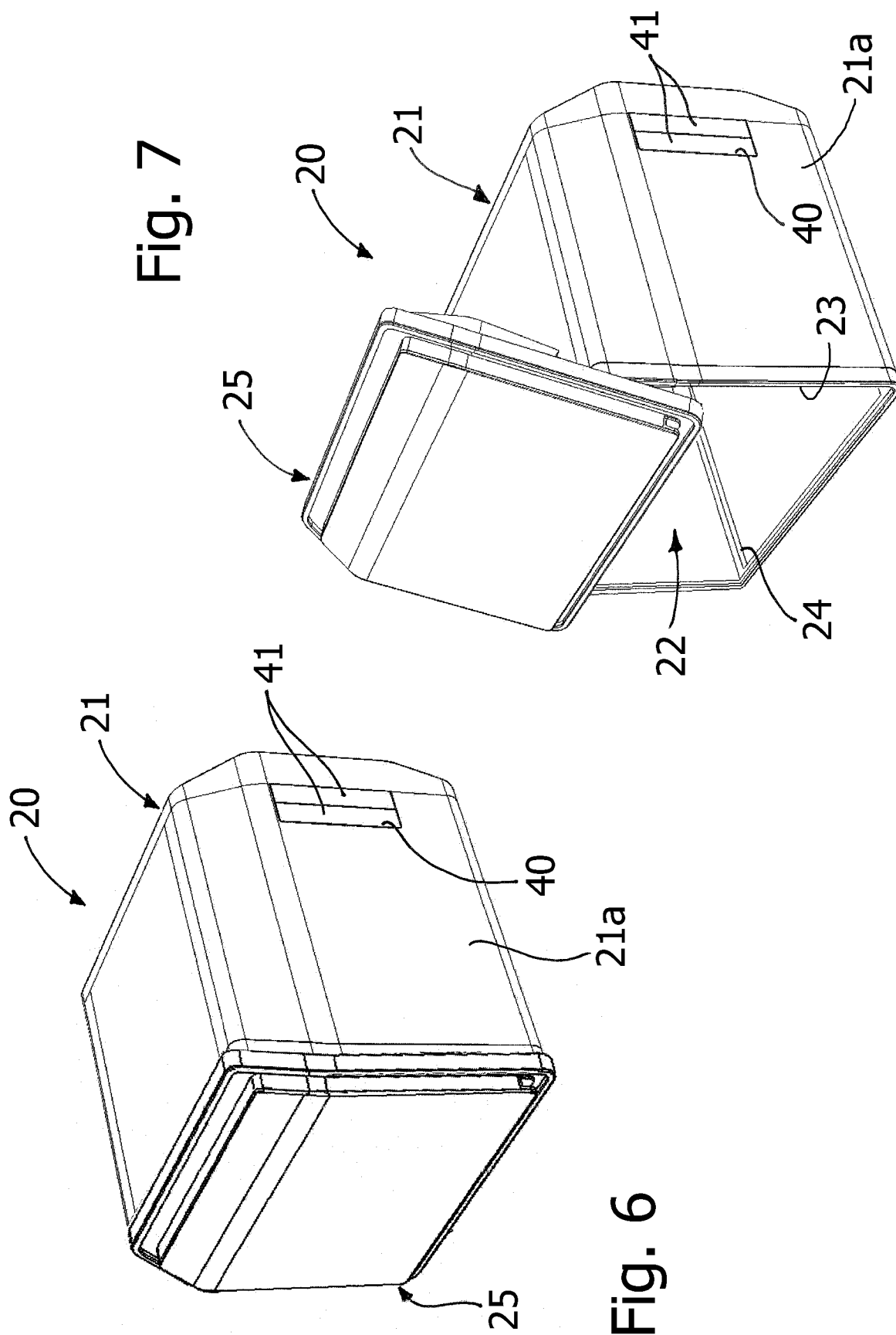


Fig. 5



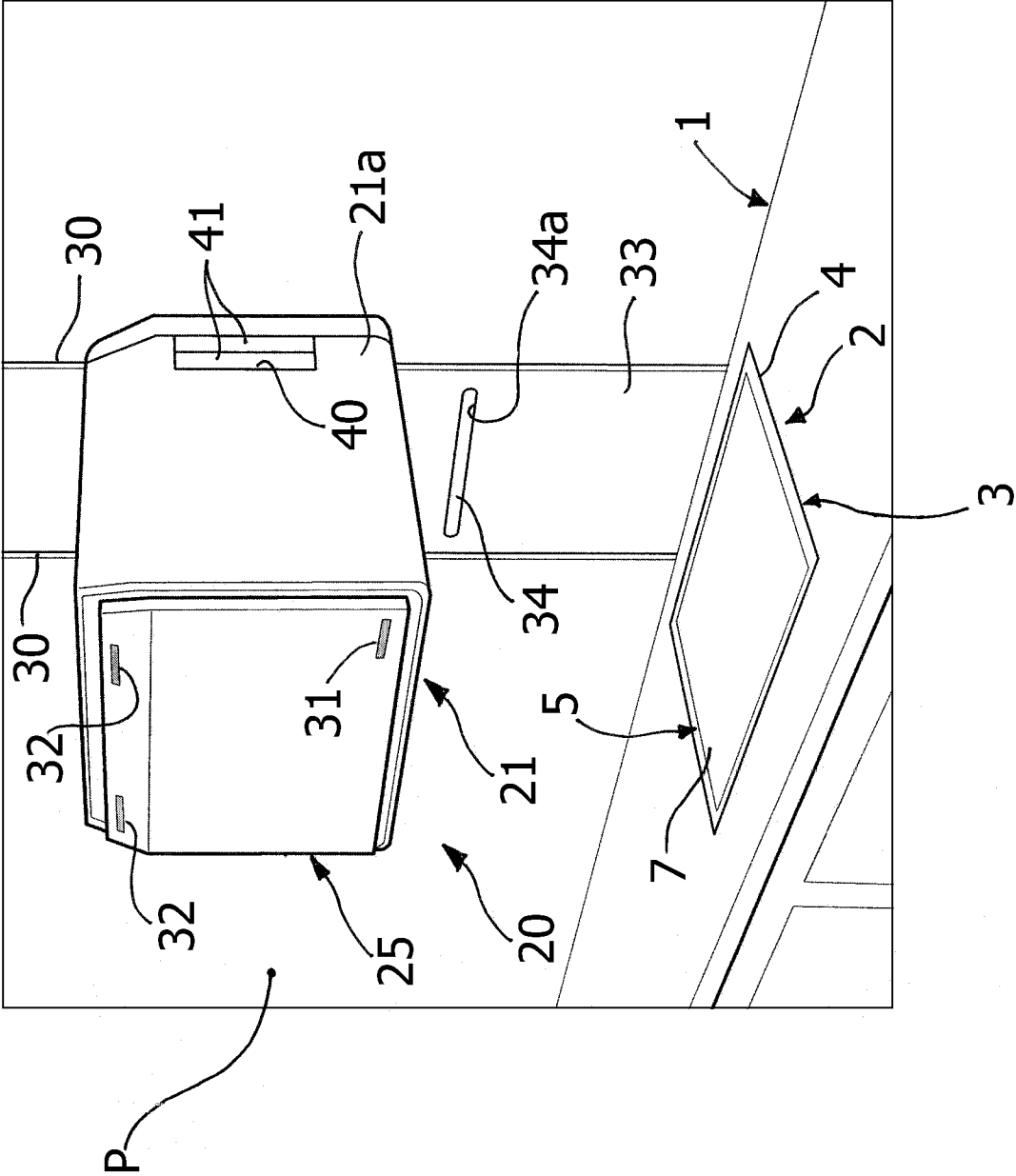


Fig. 8

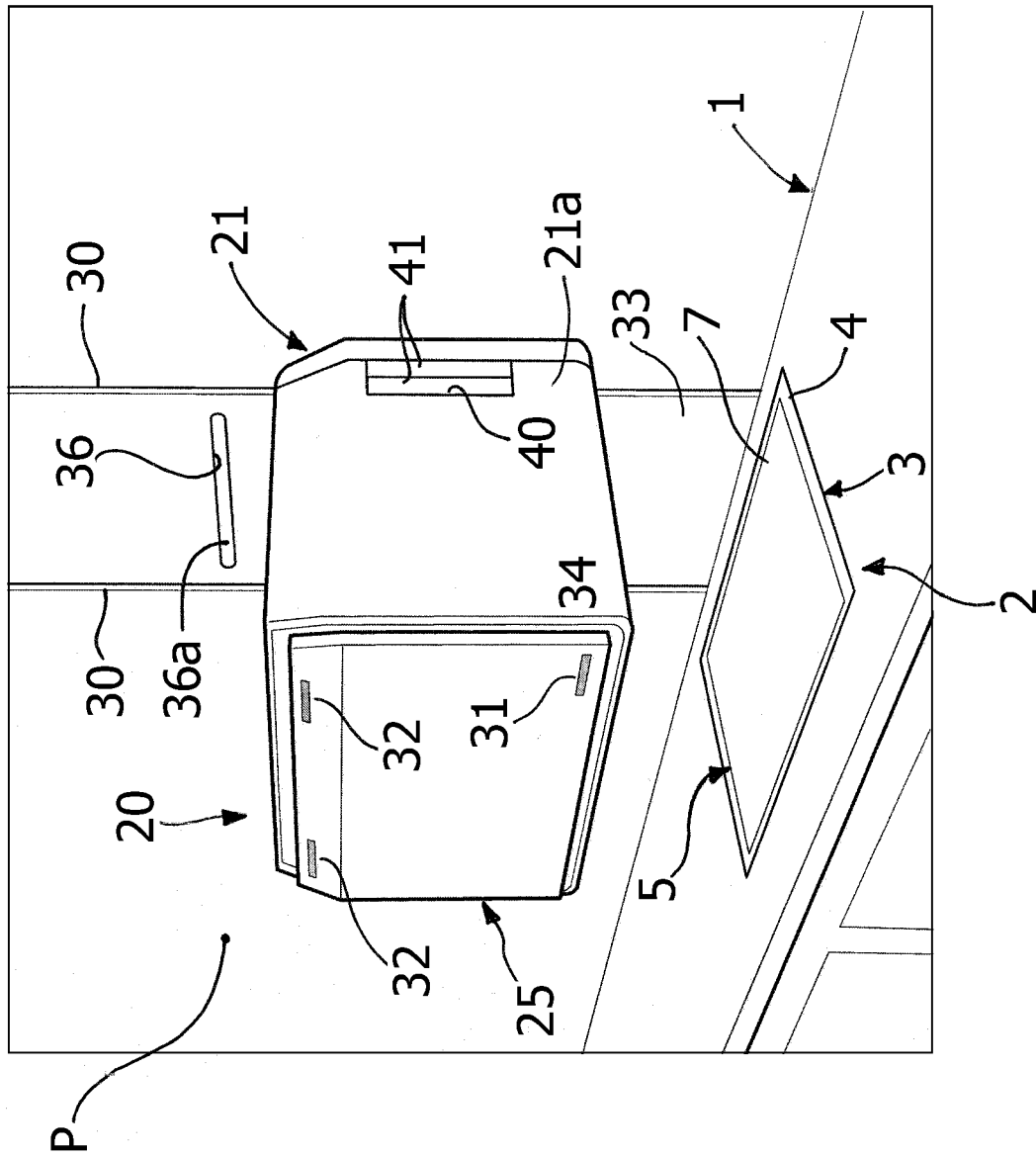


Fig. 9

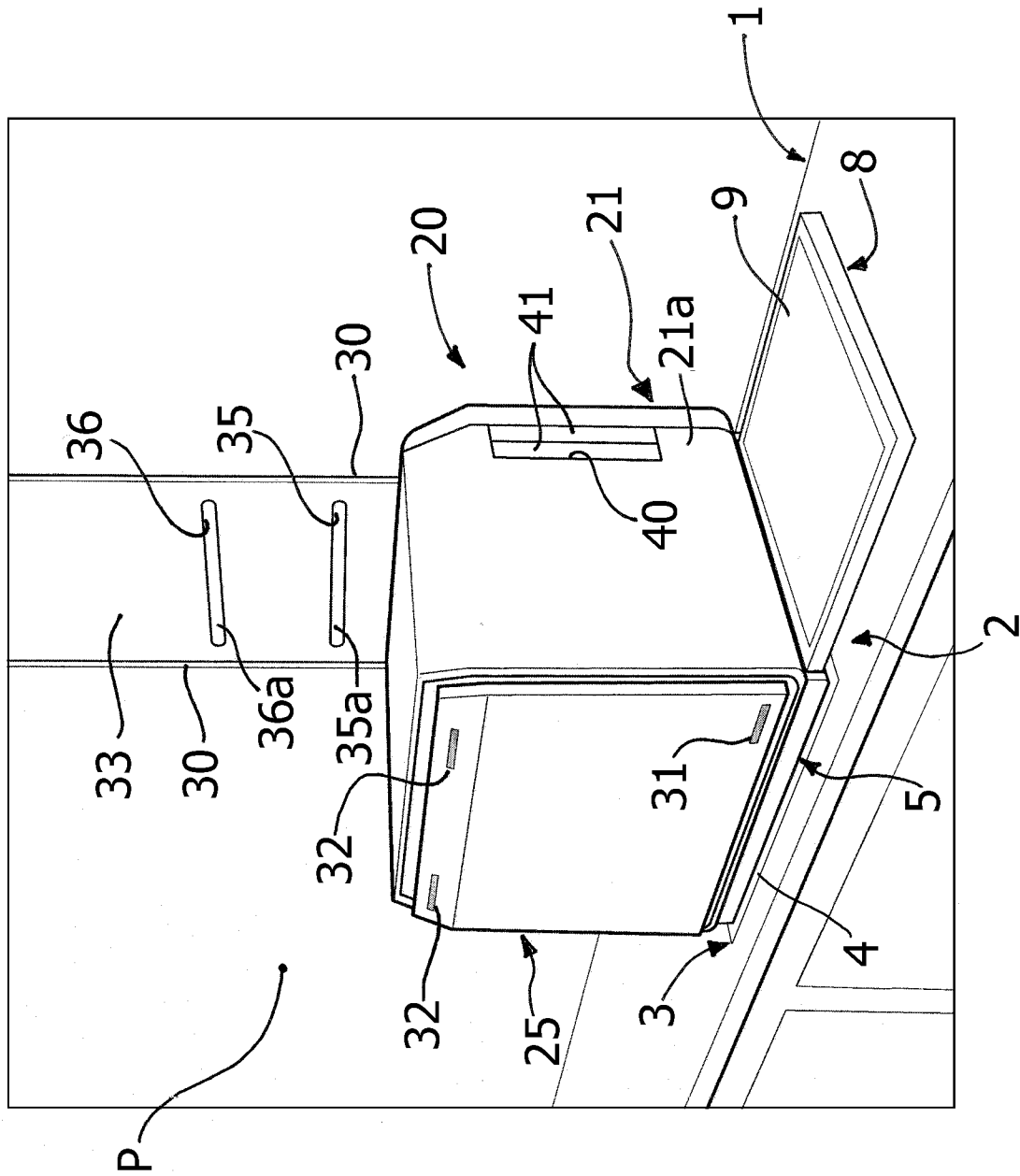


Fig. 10