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(73) Patenthaver: **ELICA S.p.A., Via Ermanno Casoli, 2, 60044 Fabriano (AN), Italien**

(72) Opfinder: **BUSSOTTO, Lorenzo, c/o Elica S.p.A., Via Ermanno Casoli 2, 60044 Fabriano (AN), Italien**
GARGIULO, Antonello, c/o Elica S.p.A., Via Ermanno Casoli 2, 60044 Fabriano (AN), Italien

(74) Fuldmægtig i Danmark: **Plougmann Vingtoft A/S, Strandvejen 70, 2900 Hellerup, Danmark**

(54) Benævnelse: **EN KOGEPLADE**

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WO-A1-2017/089925
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US-B1- 6 455 818

DESCRIPTION

Technical field

[0001] The present invention relates to a cooktop.

[0002] Particularly, but without limitation, the present invention relates to a cooktop integrating a hood that is commercially available under the name of "downdraft hood", as defined in the preamble of claim 1.

Background art

[0003] Domestic hoods have become a common feature in residential kitchens, due to their undisputed usefulness in extracting food preparation gases, i.e. vapors generated during by cooking. The provision of domestic hoods that can effectively remove cooking vapors generated during food preparation is of increasing importance.

[0004] For this purpose, hoods have been developed that can both extract air and exhaust the extracted air out of the house, using an intake section, and filter such air and recirculate it into the domestic environment.

[0005] Downdraft hoods are among the variety of commercially available hoods, and are often integrated either in a cooktop or in a kitchen furniture countertop. Namely, a downdraft hood is configured to generate a crossflow that is higher than the ascending flow rate of cooking steam, so that such steam is extracted toward the cooktop in a vertical downward direction.

[0006] One example of these downdraft hoods, which is particularly integrated in a cooktop, is shown in Patent Application IT 102016000034820, by the Applicant hereof.

[0007] This document discloses a cooktop comprising a support. Such support has a top surface and a bottom surface. Cooking areas are defined on the top surface which have the purpose of accommodating a heating element.

[0008] The support element has a suction opening for drawing cooking fumes. The cooktop further comprises a suction duct, in fluid communication with the suction opening. A centrifugal fan is in fluid communication with the suction opening, and particularly has an inlet port in fluid communication with the suction duct. The fan ejects the fumes through a outlet scroll. A motor is associated with the centrifugal fan to set it into rotation.

[0009] For treatment of cooking fumes, the prior art downdraft hood has a first filter, usually consisting of a metal grid, which is adapted to facilitate condensation of suspended liquid or

semi-liquid particulates, such as fats, in the cooking fumes.

[0010] The hood also comprises a second filter adapted to absorb odors from the cooking fumes. This filter comprises one or more elements active-carbon filter elements.

[0011] Both filters require periodic maintenance. The first filter requires removal of the grid for cleaning. The second filter requires replacement of the filter elements once they have reached saturation.

[0012] In the prior art downdraft hood, the grid may be generally removed through the suction opening of the hood. An additional opening is formed on the outer surface of the support, level with the second filter, to provide access to the filter elements and allow replacement thereof. Such additional opening is preferably formed in a rear area of the support, or of a portion of the lower surface, such that the aesthetics of the exposed parts of the downdraft hood is unaffected.

[0013] DE 102013007722, DE 102016113867 and US 2007062513 describe exemplary downdraft suction hoods only having access to one filter only, that directly faces the suction opening

[0014] WO2017089925 describes a downdraft suction hood comprising two filter holder compartments.

Problem of the prior art

[0015] One drawback is that the support area in which the additional opening is formed for maintenance of the second filter is often placed in a poorly accessible area of the hood. Accordingly, the hood may sometimes have to be displaced or at least partially disassembled to gain access to the second filter and replace the active-carbon filter elements.

Object of the Invention

[0016] Therefore, the technical purpose of the present invention is to provide a cooktop that can obviate the above mentioned prior art drawbacks.

[0017] Particularly, an object of the present invention is to provide a cooktop having a downdraft hood that allows an easy maintenance of the hood filters.

[0018] The aforementioned technical purpose and objects are substantially fulfilled by a cooktop that comprises the technical features as disclosed in one or more of the accompanying claims.

[0019] Particularly, a cooktop of the present invention comprises a support that has a suction opening. One or more heating elements are placed on the support, particularly proximate to the opening.

[0020] The cooktop also comprises suction means, connected in fluid communication with the suction opening. These suction means are configured to draw in cooking fumes proximate to the heating elements. The suction means comprise first and second filters.

[0021] The first filter has a first seat, and comprises a first filter element in the first seat. The first filter element is configured to facilitate condensation of liquid or semiliquid particles in the cooking fumes. The first seat is designed to be accessible through the suction opening, to allow the extraction and/or insertion of the first filtering.

[0022] The second filter is placed downstream from the first filter, and has a second seat which is designed to contain a plurality of second filter elements. These second filter elements are preferably of the active-carbon type. The second seat is accessible through the first seat, to thereby allow the extraction and/or insertion of the second filter elements through the suction opening.

Advantages of the Invention

[0023] The cooktop solves the aforementioned technical problem. In fact, communication of the seat of the second filter with the seat of the first filter allows the filtering elements of both filters to be pulled out through the suction opening. This simplifies maintenance of the cooktop filters, because the suction opening is placed in an easily accessible region of the support. This will avoid the need to disassemble or displace the cooktop.

Brief Description of the Figures

[0024] Further features and advantages of the present invention will result more clearly from the illustrative, non-limiting description of a preferred, non-exclusive embodiment of a cooktop as shown in the annexed drawings, in which:

- Figure 1 is a partially exploded perspective view of a cooktop of the present invention;
- Figure 2 is a bottom perspective bottom view of the cooktop of Figure 1;
- Figure 3 is a bottom sectional view of the cooktop of Figures 1 and 2; and
- Figure 4 is a perspective bottom view of the cooktop of Figures 1 and 2 while the filter elements are being pulled out.

DETAILED DESCRIPTION

[0025] The apparatus of the annexed figures shall be deemed to be schematically illustrated, not necessarily drawn to scale, and not necessarily representing the actual proportions of its parts.

[0026] Although this is not expressly shown, the individual features described with reference to each embodiment shall be intended as auxiliary and/or interchangeable with other features, as described with reference to other embodiments.

[0027] Referring to the annexed figures, numeral 1 generally designates a cooktop of the present invention.

[0028] The cooktop 1 comprises a support 2.

[0029] The support 2 has a substantially rectangular shape and has a substantially horizontally orientation during operation.

[0030] With this orientation, the support 2 has a top surface 2a and a bottom surface 2b.

[0031] Furthermore, the support 2 has a connecting edge 23 between the top surface 2a and the bottom surface 2b, such edge 23 defining a front surface 23a and a rear surface 23b opposed to the front surface 23a.

[0032] The cooktop 1 comprises one or more heating elements 3 arranged on the support 2, particularly on the top surface 2a. These heating elements 3 may be of any type already known to the skilled person such as, for example, gas burners, electric resistors or induction circuits.

[0033] The cooktop 1 has a suction opening 4 formed on the support 2 and particularly on the top surface 2a.

[0034] In the illustrated embodiment, the suction opening 4 has a circular shape. In certain alternative embodiments, the suction opening 4 may have any shape.

[0035] It shall be noted that the aforementioned heating elements 3 are located proximate to the suction opening 4, for the cooking fumes to be easily drawn in from containers placed on top of the heating elements 3.

[0036] The opening 4 has a closure member 22, which is defined, for example, by a grid. The closure member 22 particularly has the same shape and size as the opening 4. The closure member 22 is designed to allow the passage of liquids or gases and block large solid objects.

[0037] The cooktop also comprises suction means 5 in fluid communication with the suction

opening 4. These suction means 5 are configured to draw in cooking fumes in the vicinity of the heating elements. Preferably, the suction means 5 comprise a fan (not shown), more preferably of the centrifugal type.

[0038] More in detail, the cooktop 1 comprises a suction duct 6. This suction duct 6 is in fluid communication with the outside environment via the aforementioned suction opening 4. The suction duct 6 is delimited by a portion of the bottom surface 2b of the support 2, a side wall 7 and a bottom wall. As shown for example in Figure 4, the side wall 7 projects from the bottom surface 2b of the support 2. The bottom wall of the suction duct 6, not shown in Figure 4, is opposed to the bottom surface 2b of the support 2, and is connected to the edge of the side wall 7 opposed to support 2.

[0039] In the above described embodiment, the cooktop 1 comprises a collecting tray (not shown) which defines part of the suction duct 6. This collecting tray incorporates the aforementioned bottom wall of the support 2 and, in operation, is connected to the side wall 7. The collecting tray has the purpose to hold and receive any liquids or solids infiltrating through the suction opening 4 into the suction duct 6. The collecting tray is advantageously removable to be emptied and cleaned, as substantially known in the art.

[0040] Particularly referring to Figures 2 and 4, the fan is enclosed in a casing 9, and is in fluid communication with the suction duct 6 through two grids 8a, 8b formed on the casing 9. Namely, a first grid 8a is placed on an outer peripheral zone of the casing 9, and connects the suction duct 6 with a central area of the fan through a gap formed between the casing 9 and the bottom surface 2b of the support 2. Conversely, the second grid 8b is located substantially level with the central area of the fan.

[0041] The cooktop 1 also comprises an exhaust duct 10, located downstream from the suction means 5.

[0042] The exhaust duct 10 has a peripheral wall 20 located proximate to the suction duct 6. Namely, the perimeter wall 20 faces a portion of the side wall 7.

[0043] It shall be noted that, in the above described embodiment, the exhaust duct 10 comprises a divergent duct 10a directly connected to the fan. An additional duct (not shown, because it is not part of the cooktop 1) may be connected downstream from such divergent duct 10a. The shape and size of such additional duct can vary according to the particular installation of the cooktop 1.

[0044] Particularly referring to Figure 2, the suction means 5 comprise a first filter 11 and a second filter 12.

[0045] In one aspect, a second filter 12, separate from the first filter 11 and not directly facing the opening 4, is accessible through the first seat 13 of the first filter 11.

[0046] Particularly, the first filter 11 has a first seat 13, at least partially defined by the side wall 7 of the suction duct 6. A first filter element 14 is placed inside the first seat 13. This first filter element 14 has the purpose to facilitate condensation of liquid or semiliquid particles in the cooking fumes.

[0047] For example, the first filter element 14 may be defined by a metal grid or any type of fat filter that is known to the skilled person.

[0048] It shall be noted that the first seat 13 is designed to be accessible via the suction opening 4, in order to allow the insertion and/or extraction of the first filter element 14, i.e. the first seat 13 directly faces the suction opening 4.

[0049] By removing the first filter element 14 through the suction opening 4, the user may have free access to and is able to see both the first seat 13 and the suction duct 6.

[0050] While the first seat 13 substantially coincides with the suction duct 6 in the embodiment as described and illustrated herein, alternative embodiments may be provided, although not shown, in which the suction duct 6 extends beyond the first seat 13.

[0051] Particularly referring to Figures 2-4, it shall be noted that when the first filter element 14 is inserted in the first seat 13, it forms a substantially continuous plane with the top surface 2a of the support 2.

[0052] Once the closure element 22 and the first filter element 14 are removed, the first seat 13 creates a discontinuity on the top surface 2a and on the surface 2b of the support 2. In other words, the first seat 13 appears as a cavity, which substantially extends from the suction opening 4 to the bottom wall of the conduit 6. By this arrangement, the first seat 13 can be both seen by the user and manually inspected through the suction opening 4.

[0053] As shown for example in Figure 3, the aforementioned second filter 12 is placed downstream from the first filter 11. Particularly, the second filter 12 has a second seat 15 formed in the exhaust duct 10.

[0054] Such second seat 15 is designed to contain a plurality of second filtering elements 16 adapted to remove odors from cooking fumes.

[0055] For example, the second filter elements 16 may be active-carbon filters, which are already known to the skilled person.

[0056] As shown, for instance, in Figure 4, the second seat 15 is designed to be accessible through the first seat, to thereby allow the insertion and/or extraction of the second filter elements 16 through the suction opening 4.

[0057] For this purpose, the second seat 15 has a pull-out opening 17 that faces the first seat

13. Such pull-out opening 17 is particularly formed on the peripheral wall 20 of the exhaust duct 10. A door 19 is associated with the pull-out opening 17, and is able to slide toward/away with respect to the support 2 to open and/or close the pull-out opening 17.

[0058] Even more in detail, the second seat 15 is situated at the rear surface 23b of the edge 23 and the first seat 13 is interposed between said suction opening and said second seat 15. As shown in the annexed figures, the second seat 15 extends substantially between the bottom surface 2b in the rear area of the support 2 and a bottom wall 24 of the exhaust duct 10, as is clearly visible in Figure 4.

[0059] Furthermore, the second seat 15 is substantially delimited by the peripheral wall 20 and a bottom wall 25 of the exhaust duct 10 projecting from the bottom surface 2a at the rear surface 23b.

[0060] Therefore, the localization of the second seat 15 at the rear surface 23b and in the exhaust duct 10 not only prevents the view of the seat itself to the user from the suction opening 4, but also defines a neatly separation with the first seat 13 and the respective first filtering element 14.

[0061] In order to allow the passage of the second filter elements 16, the first seat 13 has a passage opening 18, which faces the pull-out opening 17 of the second seat 15. Particularly, the passage opening 18 is formed in the side wall 7 of the suction duct 6.

[0062] Such second seat 15 and its filter elements 16 are accessible through the first seat 13 after removing:

- the closure element 22,
- the first filtering element 14;
- at least part of the peripheral wall 20;
- at least part of the side wall 7, at the pull-out opening 17.

[0063] Therefore, the second seat 15 is not seen by the user from the suction opening 4, even after removal of the closure element 22 and the first filter element 14, the peripheral wall 20 and the side wall 7.

[0064] Furthermore, the first seat 13 comprises a cover element 21. This cover element 21 is associated with the passage opening 18 to open and/or close it. As shown for example in Figure 4, the cover element 21 is hinged to the side wall 7 at the passage opening 18, and is opened by pivoting relative to the side wall 7 toward the interior of the first seat 13. In certain alternative embodiments, the opening/closing mechanism of the cover element 21 may be, for example, analogous to that of the door 19 of the second seat 15.

[0065] Therefore, even after removal of the closure element 22 and the first filter element 14

an after opening the cover element 21 and the door 19, the second seat 15 is still concealed to the view of the user, as it does not directly face the suction opening 4 and/or is not proximate thereto.

[0066] More in detail, after removal of the various elements that separate the first seat 13 from the second seat 15 and vice versa, from the suction opening 4 can be substantially seen only the pull-out opening 17, which is configured to allow the second filter elements 16 to be pulled out from the second seat 15.

[0067] In other words, according to the preferred embodiment, the first seat 13 can be seen by the user and can be manually inspected, due to its position relative to the suction opening 4. However, the second seat 15 can be inspected but is not seen by the user.

[0068] Advantageously, the cooktop 1 affords convenient, quick access to a seat that is hidden to the view of the user, because it does not directly face the suction opening, through a seat that can be conversely manually inspected and seen by the user.

[0069] In order to more easily pull out the second filter elements 16, the cooktop 1 also comprises extraction means (not shown) for such second filtering elements 16. The extraction means are configured to move the second filtering elements 16 into the second seat 15 toward an area in front of the pull-out opening 17, for a user to pull them out. Particularly, the extraction means are at least partially inserted in the second seat 15. These extraction means are of a type that is known to the skilled person, and include, for example, a tape at least partially surrounding the second filtering elements 16. By pulling this tape, the user will be able to draw up the second filter elements 16 in the second seat 15 until he/she can hold them by his/her hands.

[0070] The filters in the cooktop 1 may be replaced as follows. First, the user pulls the first filter element 14 out of the first seat 4. Particularly, the user removes the closure element 22 on the suction opening 4 and later removes the first filter element 14.

[0071] In a later step, the user pulls the second filter elements 16 out of the second seat 15. For this purpose, the user opens the door 19 and the cover element 21, to thereby release the pull-out opening 17 and the passage opening 18. If needed, the collecting tray is removed in this step. The second filter elements 16 are then removed from the second seat 15 one at a time. Once the second filter element 16 located directly level with the pull-out opening 17 has been removed, the user acts on the extraction means for each of the remaining second filtering elements 16 to move them into the area in front of the pull-out opening 17. After removing this second filtering element 16, the user proceeds to the next until all of them have been removed.

[0072] Those skilled in the art will obviously appreciate that a number of changes and variants as described above may be made to fulfill particular requirements, without departure from the scope of the invention, as defined in the following claims.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT102016000034820 **[0006]**
- DE102013007722 **[0013]**
- DE102016113867 **[0013]**
- US2007062513A **[0013]**
- WO2017089925A **[0014]**

Patentkrav

1. Kogeplade (1) omfattende:

- en støtte (2) med en sugåbning (4); en overside (2a), en underside (2b) og en forbindelseskant (23) mellem oversiden (2a) og undersiden (2b); nævnte forbindelseskant har en forside (23a) og en bagside (23b) modstående nævnte forside (23a);

- et eller flere varmeelementer (3) anbragt på nævnte støtte (2) i nærheden af nævnte overside (2a);

- sugorgan (5) forbundet i fluidforbindelse med nævnte sugåbning (4) og konfigureret til at indsuge madlavningsdampe, i nærheden af nævnte varmeelementer (3), hvor nævnte sugorgan (5) omfatter første (11) og andet (12) filter;

- nævnte første filter (11) har et første sæde (13) og omfatter et første filterelement (14) i nævnte første sæde (13), hvor nævnte første sæde (13) er tilgængeligt igennem nævnte sugåbning (4) for at muliggøre udtrækningen og/eller indsættelsen af nævnte første filterelement (14);

- nævnte andet filter (12), placeret nedstrøms fra nævnte første filter (11), har et andet sæde (15), separat fra nævnte første sæde (13), og omfatter en flerhed af andet filterelementer (16) af forskellige typer i forhold til nævnte første filterelement (14) og indsat i nævnte andet sæde (15);

kendetegnet ved, at

- nævnte andet sæde (15) er placeret ved bagsiden (23b) af kanten (23) og nævnte første sæde (13) er indskudt mellem nævnte sugåbning og nævnte andet sæde (15);

- nævnte andet sæde (15) er tilgængeligt igennem nævnte første sæde (13), for at muliggøre udtrækningen og/eller indsættelsen af nævnte andet filterelementer (16) igennem nævnte sugåbning (4), passerende igennem nævnte første sæde (13).

2. Kogeplade (1) ifølge krav 1, **kendetegnet ved, at** den omfatter en udsugningskanal (10) placeret nedstrøms fra nævnte sugorgan (5) ved nævnte bagside (23b), hvor nævnte andet sæde (15) er dannet i nævnte udsugningskanal

(10), nævnte udsugningskanal har en perifer væg (20) der separerer nævnte første sæde (13) fra nævnte andet sæde (15).

3. Kogeplade (1) ifølge krav 2, hvor nævnte andet sæde (15) har en udtræksåbning (17) der vender mod nævnte første sæde (13), hvor nævnte udtræksåbning (17) er defineret på nævnte perifere væg (20).

4. Kogeplade (1) ifølge det foregående krav, **kendetegnet ved, at** den omfatter en dør (19) associeret med nævnte udtræksåbning (17) og glider væk fra//mod nævnte støtte (2) for at åbne og/eller lukke nævnte udtræksåbning (17).

5. Kogeplade (1) ifølge et hvilket som helst af kravene 3 til 4, hvor nævnte første sæde (13) har en gennemgangsåbning (18) der vender mod nævnte udtræksåbning (17) for at muliggøre gennemgangen af nævnte andet filterelementer (16).

6. Kogeplade (1) ifølge det foregående krav, **kendetegnet ved, at** den omfatter en sugkanal (6) i fluidforbindelse med det udvendige miljø igennem nævnte sugåbning (4), hvor nævnte første sæde (13) er mindst delvist defineret af nævnte sugkanal (6), nævnte sugkanal (6) omfatter en sidevæg (7) placeret ved nævnte første sæde (13) og fremspringende fra en underside (2b) af nævnte støtte (2), hvor nævnte gennemgangsåbning (18) er dannet i nævnte sidevæg (7).

7. Kogeplade (1) ifølge krav 5 eller 6, hvor nævnte første sæde (13) omfatter et dækkeelement (21) associeret med nævnte gennemgangsåbning (18), til at åbne/lukke sidstnævnte.

8. Kogeplade (1) ifølge det foregående krav, hvor nævnte dækkeelement (21) er hængslet til nævnte sidevæg (7) at nævnte gennemgangsåbning (18) til at åbne mod det indre af nævnte første sæde (13).

9. Kogeplade (1) ifølge et hvilket som helst af kravene 3 til 8, **kendetegnet ved, at** den omfatter udtrækningsorganer til at udtrække nævnte andet filterelementer (16) konfigureret til at skubbe nævnte andet filterelementer (16) til nævnte andet sæde (15) i et område foran nævnte udtræksåbning (17) så en bruger er i stand til at trække dem ud.

10. Kogeplade (1) ifølge det foregående krav, hvor nævnte udtrækningsorganer er mindst delvist indsat i nævnte andet sæde (15).

DRAWINGS

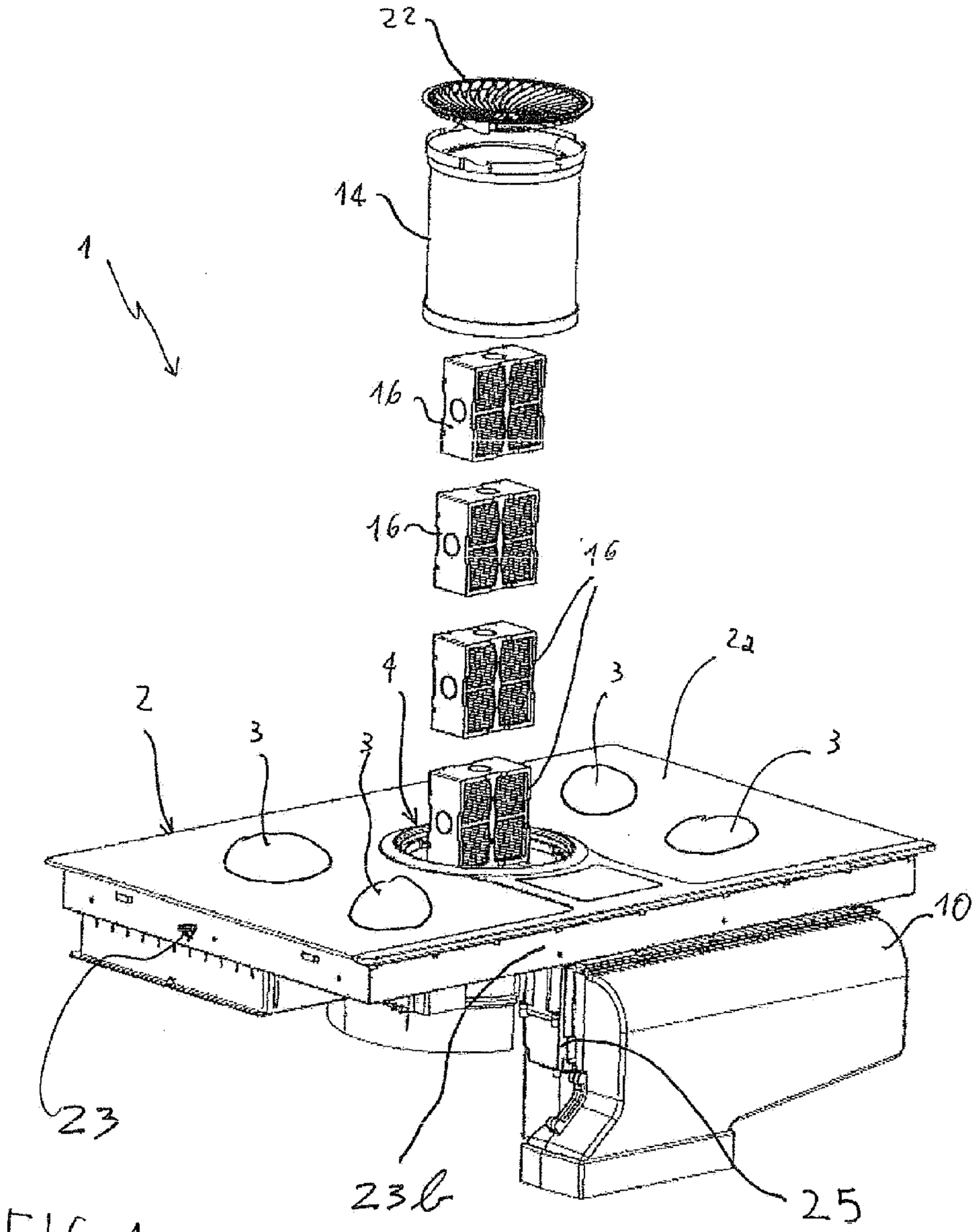


FIG. 1

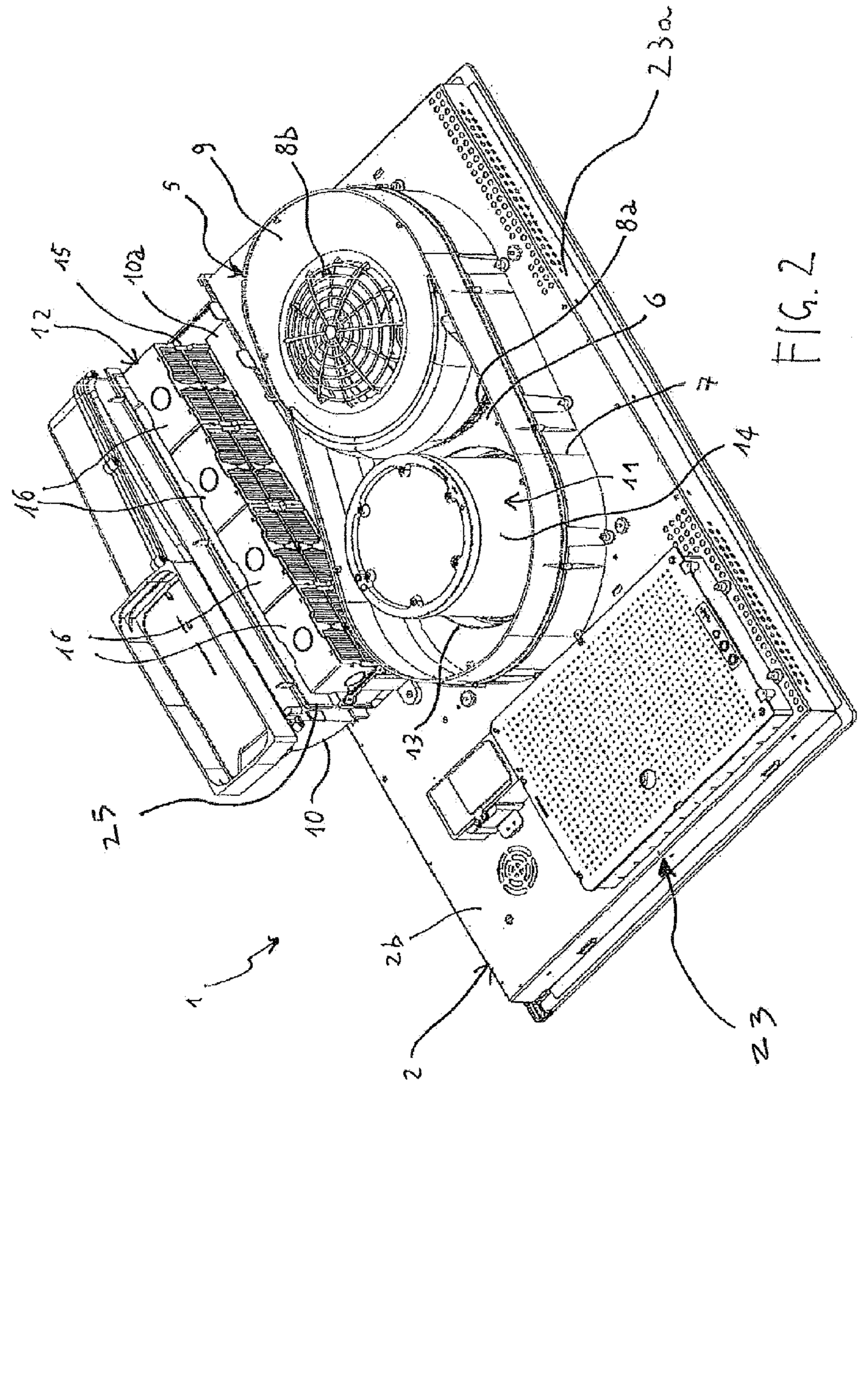


FIG. 2

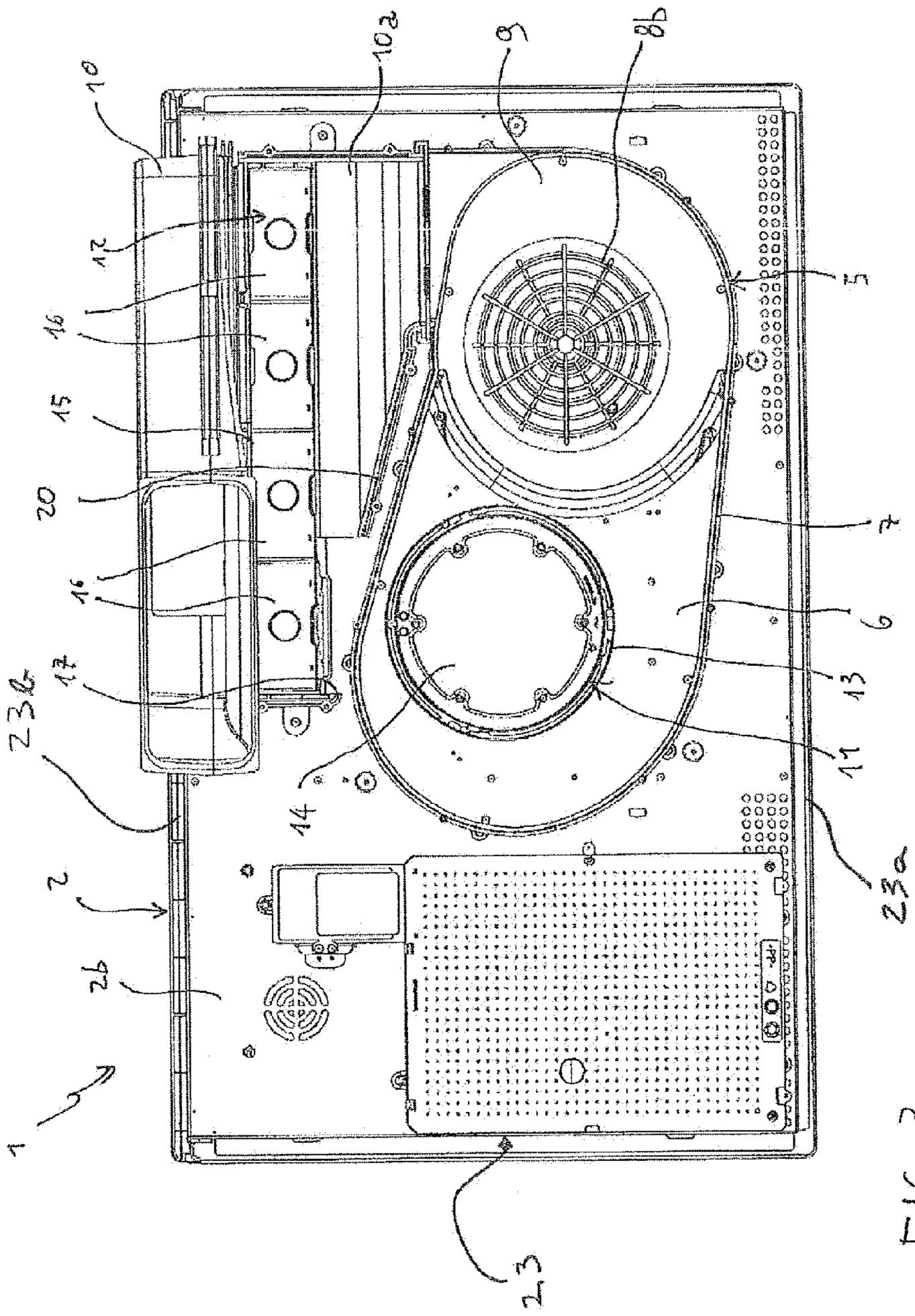


FIG. 3

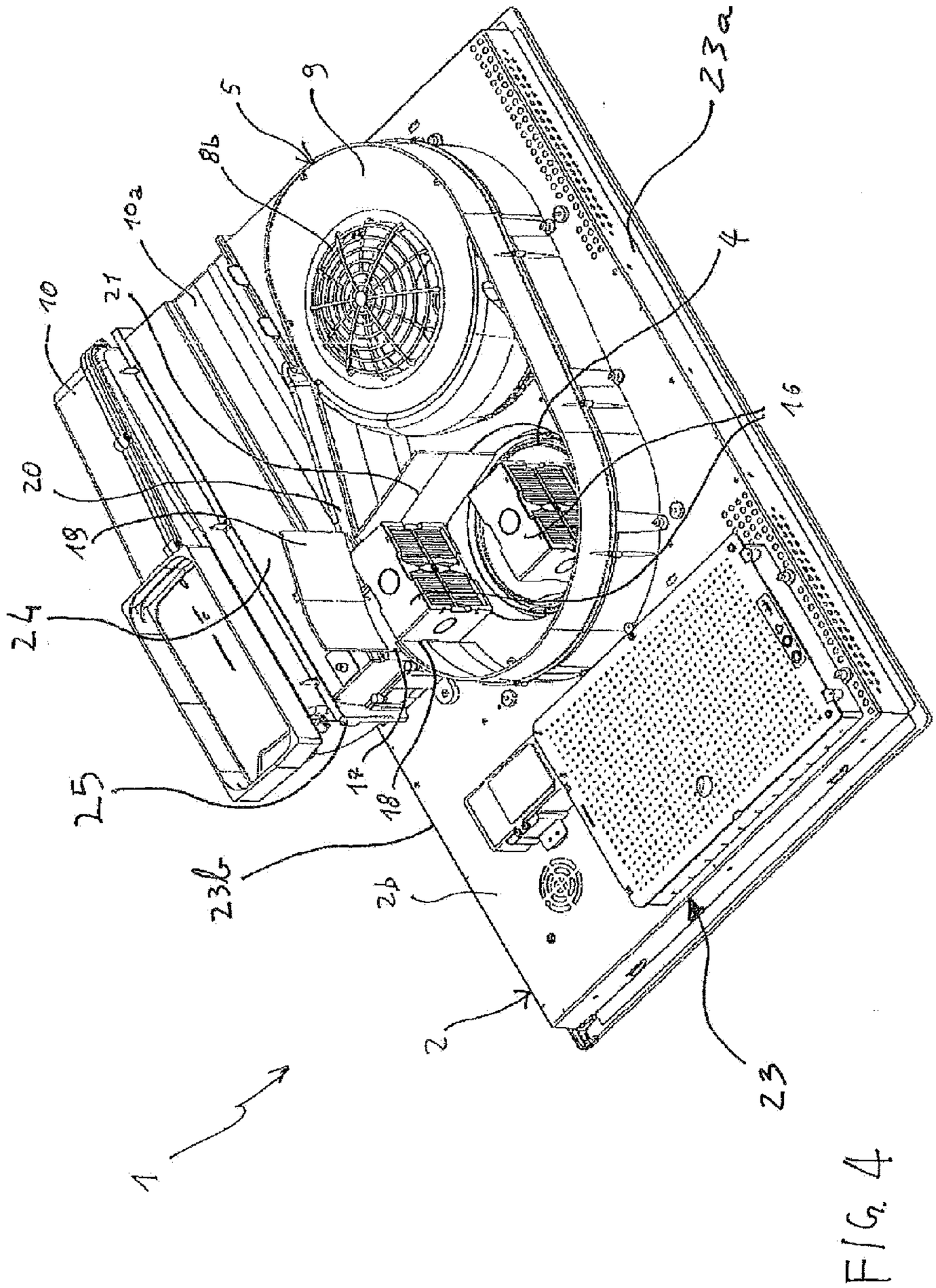


FIG. 4