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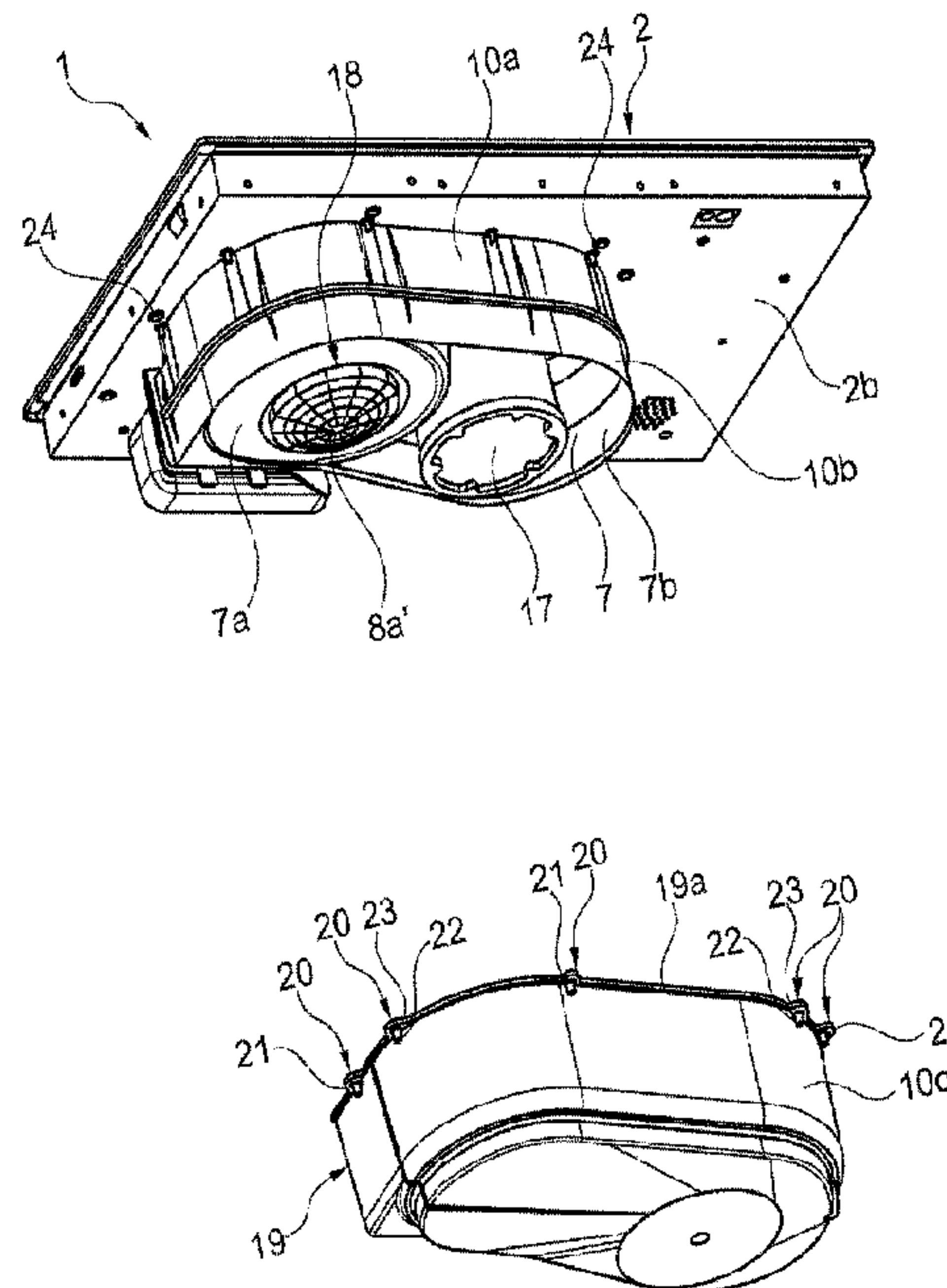


Fig. 2

(57) Abrégé/Abstract:

The present invention relates to a cooktop (1) which comprises a support element (2) having a top surface (2a) and a bottom surface (2b); at least one cooking area (3) which is configured to accommodate a heating element at the top surface (2a); a suction opening (5) for drawing cooking fumes; a suction duct (7) in fluid communication with the suction opening (5); suction means (18) associated with the suction opening (5) for drawing cooking fumes through the suction opening (5) and the suction duct (7); a collecting tray (19) located below the suction opening (5) for collecting liquids flowing through the suction opening (5); a plurality of magnetic elements (21), which are fixed to the tray (19) for magnetic coupling to the support element (2).

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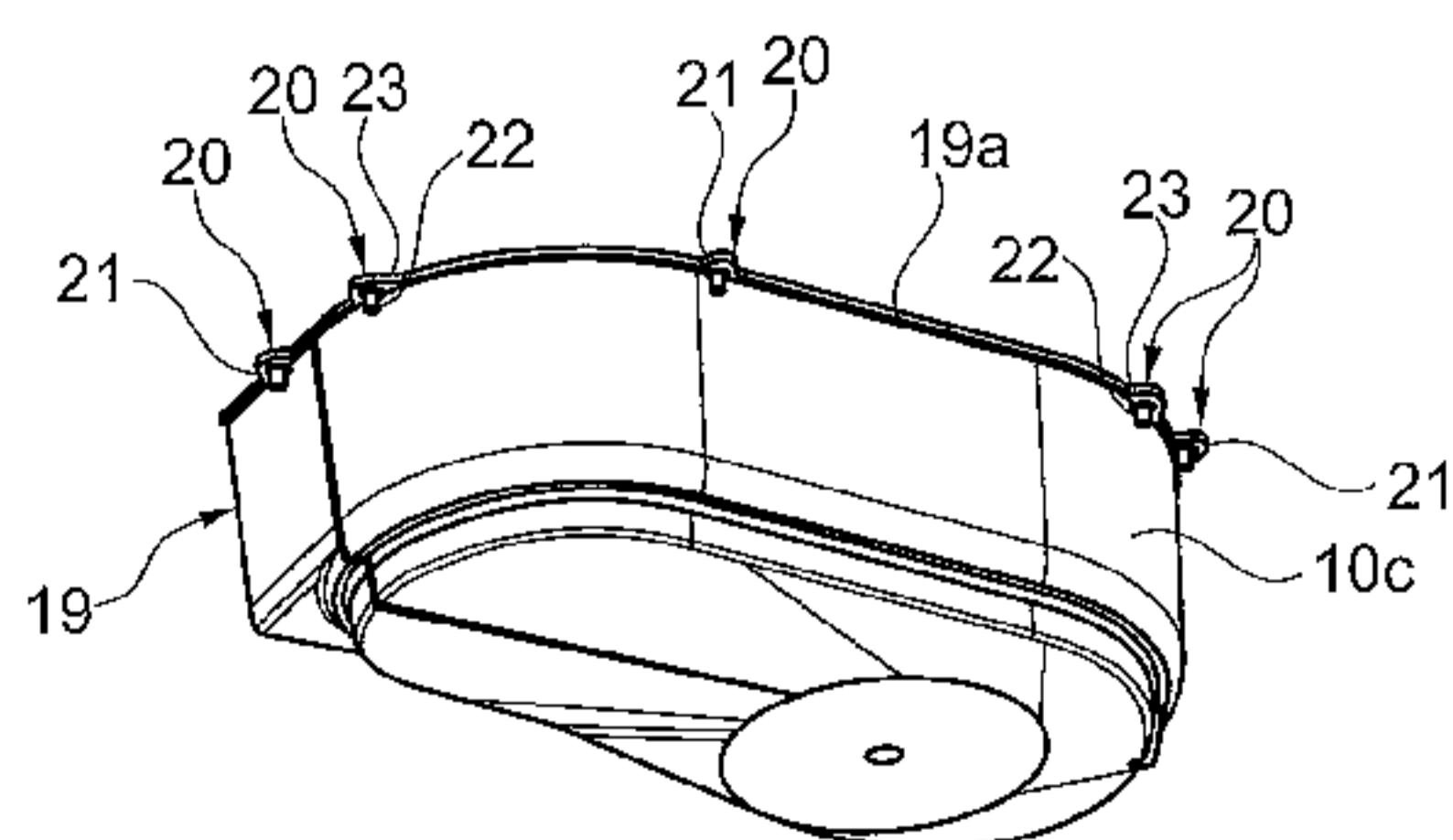
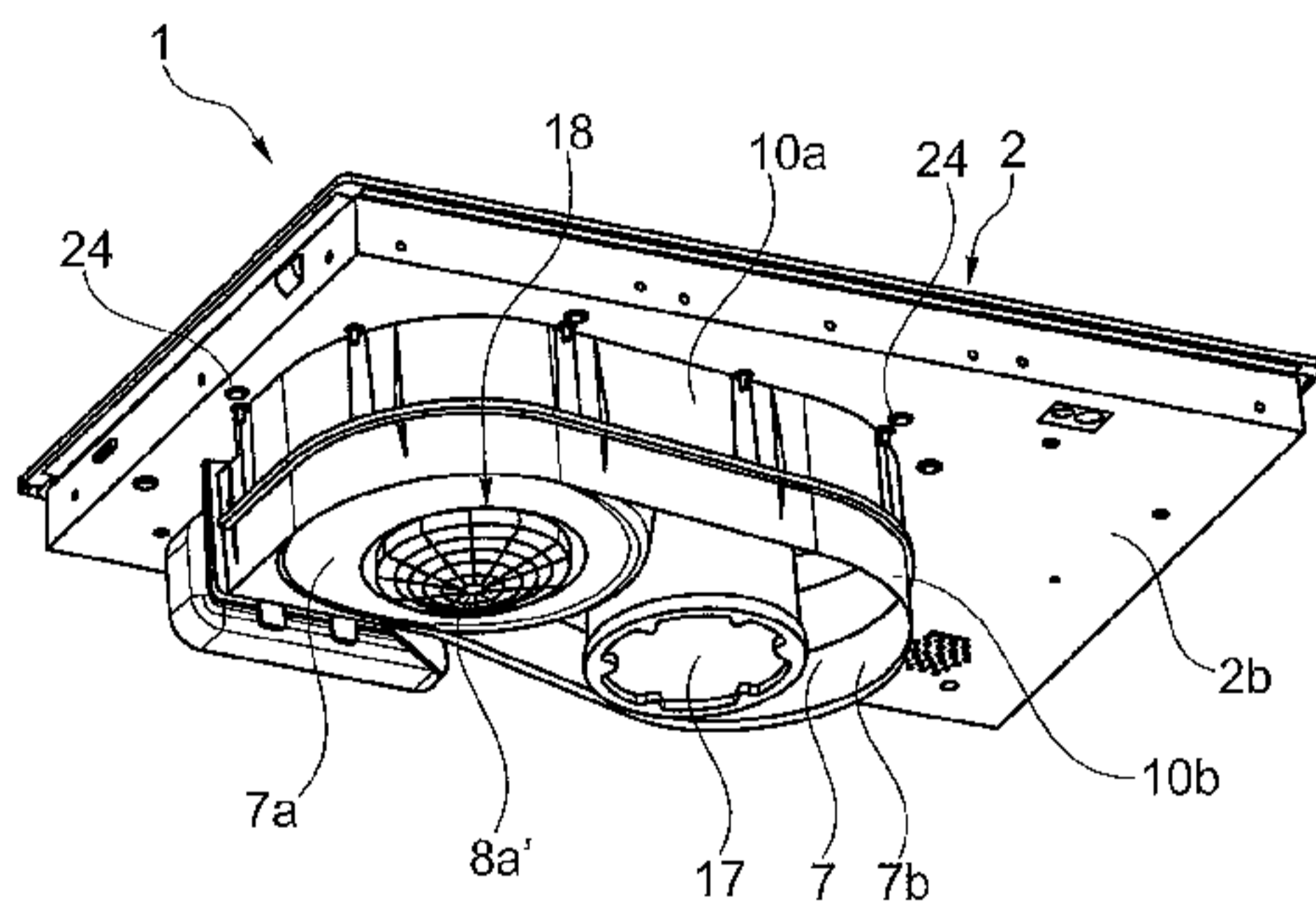


Fig. 2

(57) Abstract: The present invention relates to a cooktop (1) which comprises a support element (2) having a top surface (2a) and a bottom surface (2b); at least one cooking area (3) which is configured to accommodate a heating element at the top surface (2a); a suction opening (5) for drawing cooking fumes; a suction duct (7) in fluid communication with the suction opening (5); suction means (18) associated with the suction opening (5) for drawing cooking fumes through the suction opening (5) and the suction duct (7); a collecting tray (19) located below the suction opening (5) for collecting liquids flowing through the suction opening (5); a plurality of magnetic elements (21), which are fixed to the tray (19) for magnetic coupling to the support element (2).

“A cooktop”**DESCRIPTION**

The present invention relates to a cooktop in accordance with the preamble of claim 1.

5 Particularly, but without limitation, the present invention relates to a cooktop integrating a hood that is commercially available under the name of “downdraft hood”.

BACKGROUND OF THE INVENTION

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.

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.

15 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.

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

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

25 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.

5 A motor is associated with the centrifugal fan to set it into rotation. Such motor is fixed to the support element 2.

The prior art cooktop further comprises a collecting tray, located below the suction opening. Such tray has the purpose of collecting liquid or semi-liquid any cooking residues, such as water, oil, grease or else, that may flow through the suction
10 opening. The cooktop comprises coupling means for the tray, particularly screws, which have the purpose of reversibly fixing the tray to the support element.

The above described cooktop was found by the Applicant to be affected by the drawback that an excessively labor-intensive operation is required to remove the tray, for example when it has to be emptied and cleaned.

15 SUMMARY OF THE INVENTION

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

Particularly, the present invention has the object of providing a cooktop that can afford easier cleaning of the tray.

20 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.

Advantages

25 Particularly, a cooktop in accordance with the present invention comprises a support element that has a top surface and a bottom surface. At least one cooking area is

configured to accommodate a heating element at the top surface. The support element further has a suction opening for drawing cooking fumes.

The cooktop also comprises a suction duct, in fluid communication with the suction opening. Suction means are associated with the suction opening to draw in fumes
5 through the suction opening and the suction duct.

The cooktop further comprises a collecting tray, located below said suction opening. Such tray has the purpose of collecting liquids that flow through the suction opening. For example, liquids may flow into the collecting tray through the suction opening as they are drawn in by the suction means, or because they flow over the food-
10 preparing containers.

The cooktop further comprises coupling means associated with the tray for reversibly fixing the tray to the support element. These coupling means comprise a plurality of magnetic elements, which are fixed to the tray for magnetic coupling to the support element.

15 Advantageously, the use of magnetic elements for fixation of the tray affords quicker installation and removal thereof and, as a result, simplifies cleaning and maintenance of the cooktop.

LIST OF DRAWINGS

Further features and advantages of the present invention will result more clearly
20 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 perspective top view of a cooktop of the present invention;
- Figure 2 is a partially exploded perspective bottom view of the cooktop of Figure 1;
- 25 - Figure 3 is an exploded perspective view of the cooktop of Figures 1 and 2; and

- Figure 4 is a perspective view of a detail of the cooktop of Figures 1 and 2.

DETAILED DESCRIPTION

Even when this is not expressly stated, the individual features as described with reference to the particular embodiments shall be intended as auxiliary to and/or
5 interchangeable with other features described with reference to other exemplary embodiments.

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

The cooktop 1 comprises a support element, which has a top surface 2a and a
10 bottom surface 2b. Namely, when the cooktop 1 is installed, the top surface 2a of the support element 2 is designed to be the exposed or visible side and the bottom surface 2b is designed to be the side that is hidden to the view of users, e.g. embedded in kitchen furniture.

Therefore, in one aspect, the support element defines a volume that is adapted to
15 contain the parts required for controlling and heating/cooking food, as well as for downward extraction of cooking vapors.

In one embodiment, the top surface 2a is embodied as a glass sheet or a sheet made of any material having glass-like properties (not shown).

According to a preferred aspect, both the top surface 2a and the bottom surface 2b
20 are embodied as parallel and opposed flat surfaces.

More in detail, the support element 2 has at least one cooking area 3 which is configured to accommodate a heating element (not shown) at the top surface 2a.

Particularly referring to Figure 1, a plurality of cooking areas 3 may be defined on the top surface 2a. In this case, the cooking areas 3 are suitably distributed over the top
25 surface 2a of the support element 2 and are particularly designed to radiate heat, if the

heating elements are of resistive type, or induce heat generation in appropriate cooking containers, if the heating elements are of inductive type.

In the embodiment of Figure 1, there are four cooking areas 3, although different alternative embodiments, not shown, may be provided, in which a greater or smaller
5 number of cooking areas.

The support element 2 further has a cavity 4, which substantially extends between the top surface 2a and the bottom surface 2b. Preferably, the cavity 4 is located in a central area relative to the positions of the cooking areas 3. In the embodiment of the figures, the cavity 4 extends from the top surface 2a and almost reaches the bottom
10 surface 2b without touching it, i.e. leaves a space that may be designed for collection of fluids.

The support element 2 further has a suction opening 5, particularly situated at the cavity 4, for drawing cooking fumes. Preferably, the suction opening 5 has a circular shape and is protected by a grille 6. The grille 6 is preferably removable for maintenance
15 purposes.

The grille 6 has a safety purpose, as it prevents the introduction of foreign elements into the suction opening 5.

In one aspect, also referring to Figure 2, the cooktop 1 comprises a filter 17 arranged in the cavity 4 to filter out grease and vapors in cooking gases.

20 Namely, such filter 17 is designed to create a form-fit with the cavity 4.

Preferably, the filter 17 is a grease filter consisting of metal mesh or other materials having similar characteristics.

In a preferred embodiment, the filter 17 has a cylindrical shape and can be pulled off the cavity 4 for the user to carry out normal maintenance operations, such as cleaning
25 or replacement.

The cooktop 1 also comprises a suction duct 7, in fluid communication with the suction opening 5.

The cooktop 1 also comprises suction means 18 associated with the suction opening 5. Particularly, the suction means 18 can draw in cooking fumes through the suction opening 5 and the suction duct 7.

More in detail, the suction means 18 comprise a centrifugal fan 8 having an inlet port 8a and an outlet scroll 8b. The inlet port 8a is in fluid communication with the suction duct 7. Particularly referring to Figure 3, it shall be noted that the centrifugal fan 8 has two inlet ports 8a and 8a' at the axis of rotation, located on each side of the fan 8.

The suction means 18 further comprise a motor 9 associated with the centrifugal fan 8 to set it into rotation. Particularly, the motor 9 is mechanically coupled to the centrifugal fan 8, e.g. by a direct mechanical coupling between the rotor of the motor 9 and the hub of the centrifugal fan 8. In a preferred embodiment, the diameter of the centrifugal fan 8 is 185 mm and its rotation, imposed by the motor 9 may be as high as 2700-3000 revolutions/min. Alternative embodiments, not shown, can be provided, in which the dimensions of the centrifugal fan 8 and the rpm of the motor 9 may be changed to meet any new design specifications.

More in detail, the cooktop 1 comprises connection means (not shown), operable between the motor 9 and the support element 2, particularly its bottom surface 2b. Such connection means may comprise a plurality of screws (not shown) and a corresponding number of holes (not shown), formed on the bottom surface 2b of the support element 2. In alternative embodiments, the screws 24 may be replaced by any analogous fastening element known to the skilled person, such as, by way of example, rivets, welds, glue or else.

The cooktop 1 further comprises a collecting tray 19. Such tray 19 is located

below the suction opening 5. The tray 19 partially defines the suction duct 7. The tray 19 has the purpose of collecting liquids that flow through the suction opening 5. Particularly, these liquids may be collected by the tray 19 by being drawn in by the suction means 18 with the cooking fumes, or may be drawn (or not drawn) by the suction means 18 as they
5 flow over containers.

For example, these liquids may be water, steam and/or water mixed with oil and/or greases.

In operation, the tray 19 is fixed to the support element 2, particularly to its bottom surface 2b, at a top edge 19a thereof.

10 More in detail, the cooktop 1 comprises coupling means 20 associated with the tray 19 for reversibly fixing it to the support element 2. These coupling means 20 are particularly arranged along the top edge 19a of the tray 19.

The coupling means 20 comprise a plurality of magnetic elements 21 attached to the tray 19. The magnetic elements 19 have the purpose of magnetically coupling to the
15 support element 2, particularly to its bottom surface 2b. Such magnetic elements 21 are arranged along the aforementioned top edge 19a of the tray 19, such that they may face the bottom surface 2b of the support element 2.

As particularly shown in Figure 4, the embodiment of the invention as disclosed comprises four magnetic elements 21. In alternative embodiments, not shown, any
20 number of magnetic elements 21 may be provided. In the embodiment of the invention as disclosed, the magnetic elements 22 may be permanent magnets.

Still referring to Figure 4, it shall be noted that the coupling means 20 for the tray 19 also comprise at least one mechanical safety element 22 which has the purpose of locking the tray 19 in a predetermined position on the support element 2. Preferably, the
25 connection means 20 comprise at least two mechanical safety elements 22.

More in detail, when the tray 19 is fixed to the support element 2, each mechanical safety element 22 can be switched between a locked position and a releasable position. In the locked position, the mechanical safety element 22 prevents the tray 19 from being separated from the support element 2. Conversely, once all the mechanical safety elements 22 have been switched into the releasable position, the operator shall simply overcome the magnetic attraction force that causes the magnetic elements 21 to adhere to the bottom surface 2b of the support element 2 to be able to detach the tray 19.

It shall be noted that, like the aforementioned magnetic elements 21, the mechanical safety elements 22 are arranged along the top edge 19b of the tray 19. Particularly, each mechanical safety element 22 is placed between two magnetic elements 21.

More in detail, the mechanical safety element 22 is defined by a key 23. The support element 2 has at least one hole 24 for the key 23. The key is designed to fit into the hole 24 and be locked in the hole 24, to lock the tray 19 on the support element 2. Particularly, the hole 24 has such a shape as to allow the key 23 to be locked therein by rotating by a quarter of a turn.

As shown for instance in Figure 3, the cooktop 1 comprises a housing 10 for the centrifugal fan 8. The housing 10 defines both the suction duct 7 and the outlet scroll 8b of the centrifugal fan 8.

The housing 10 is in turn defined by first 10a and second 10b half-parts and a partition element 10d. It is further closed by a cover element 10c. As clearly shown in Figure 3, in operation the centrifugal fan 8a is situated between the two half-parts 10a, 10b.

More in detail, the first half-part 10a has a perimeter wall 11 which at least partially defines the suction duct 7 and the outlet scroll 8b. A partition wall 12 separates

the suction duct 7 from the outlet scroll 8b of the centrifugal fan 8. A diaphragm 13 is transverse to the walls 11, 12 and at least partially defines the outlet scroll 8b of the centrifugal fan 8, and has one of the two aforementioned inlet ports 8a which, once the cooktop 1 is assembled, channels air into the centrifugal fan 8. The first half-part 10a is
5 directly fixed to the support element 2.

The second half-part 10b is configured to close the first half-part 10a, and is particularly fixed to the first half-part 10a. More in detail, the second half-part has its own perimeter wall 14 and a partition wall 15, which correspond to the same walls 11, 12 of the first half-part 10a and are configured to mate against them. The second half-part 10b
10 further comprises an additional diaphragm 16, transverse to the walls 14, 15, which defines the other inlet port 8a of the centrifugal fan 8.

The partition element 10b overlies the two half-parts 10a, 10b, at the partition walls 12, 15. In operation, the partition element divides the stream of fumes into two branches 7a of the suction duct 7. Each branch 7a ends in one of the respective inlet ports
15 8a of the fan 8.

More in detail, the partition element 10b has an outer surface 25 that faces a section 7b of the suction duct 7, and an inner surface 26 that faces the branches 7a of the suction duct 7.

Due to the profile of the outer surface 25 of the partition element 10d, the cooking
20 vapors are divided between the two branches 7a of the suction duct 7 and, due to the profile of the inner surface 26, the two portions of the vapors are conveyed by laminar flow toward the two inlet ports 8a of the centrifugal fan 8. Particularly, the curved shape of the partition wall 10d makes such portions more laminar as it facilitates and promotes their movement toward the housing of the fan 8.

25 In a preferred embodiment, the curved shape of the partition element 10d has the

shape of an arc of a parabola.

In one aspect, the first stream portion that flows in the respective branch 7b of the suction duct 7 to reach the port 8a of the centrifugal fan 8, shall flow through a first intake grille 27, and the second stream portion shall flow through a second intake grill 28
5 to access the port 8a' of the centrifugal fan 8.

It shall be noted that the grilles 27, 28 are the grilles required by regulations to protect user safety, by preventing users from directly reaching the centrifugal fan 8 and the electrically powered parts.

Concerning the cover element 10c, it has the shape of a half-shell and, once the
10 cooktop 1 is assembled, it encloses the two half-parts 10a, 10b and the partition element, in combination with the support element 2. It shall be further noted that, in the embodiment as disclosed, the cover element 10c defines the tray 19 and hence its top edge defines the aforementioned top edge 19b of the tray 19.

Those skilled in the art will obviously appreciate that a number of changes and
15 variants may be made to the arrangements as described hereinbefore to meet incidental and specific needs. All of these variants and changes fall within scope of the invention, as defined in the following claims.

CLAIMS

1. A cooktop (1) comprising:

- a support element (2) having a top surface (2a) and a bottom surface (2b);
- at least one cooking area (3) configured to accommodate a heating element at said top
5 surface (2a);
- a suction opening (5) for drawing cooking fumes;
- a suction duct (7) in fluid communication with said intake opening (5);
- suction means (18) associated with said suction opening (5) for drawing the cooking
fumes through said suction opening (5) and said suction duct (7);
- 10 - a collecting tray (19) located below said suction opening (5) for collecting liquids
flowing through said suction opening (5);
- coupling means (20) associated with said tray (19) for reversibly fixing said tray (19) to
said support element (2);

characterized in that said coupling means (20) comprise a plurality of magnetic
15 elements (21), which are fixed to said tray (19) for magnetic coupling to said support
element (2).

2. A cooktop (1) as claimed in the preceding claim, wherein said magnetic elements (21)
are placed on an upper edge (19b) of said tray (19).

20

3. A cooktop (1) as claimed in any of the preceding claims, wherein four of said magnetic
elements (21) are provided.

4. A cooktop (1) as claimed in any of the preceding claims, characterized in that it
25 comprises at least one mechanical safety means (22) which is configured to lock said tray

(19) in a predetermined position on said support element (2).

5 5. A cooktop (1) as claimed in claim 4, wherein said mechanical safety means (22) is placed on said upper edge (19b) of said tray (19), particularly between two magnetic elements (21).

6. A cooktop (1) as claimed in claim 4 or 5, wherein said mechanical safety element (22) is defined by a key (23).

10 7. A cooktop (1) as claimed in claim 6, wherein said support element has at least one hole (24) for said key (23), said key (23) being designed to fit into said hole (24) and be locked in said hole (24), thereby locking said tray (19) on said support element (2).

15 8. A cooktop (1) as claimed in any of the preceding claims, characterized in that said suction means (18) comprise a centrifugal fan (8) and a motor (9) connected to said centrifugal fan (8); said cooktop (1) further comprising a housing (10) for the centrifugal fan (8), said housing (10) defining said suction duct (7), said housing (10) comprising a partition element (10b) operable on a vapor stream in the duct (7) to divide said vapor stream into two portions, each directed toward a respective inlet (8a, 8a') of said
20 centrifugal fan.

9. A cooktop (1) as claimed in claim 8, characterized in that said partition element (10d) has the shape of an arc, preferably an arc of a parabola.

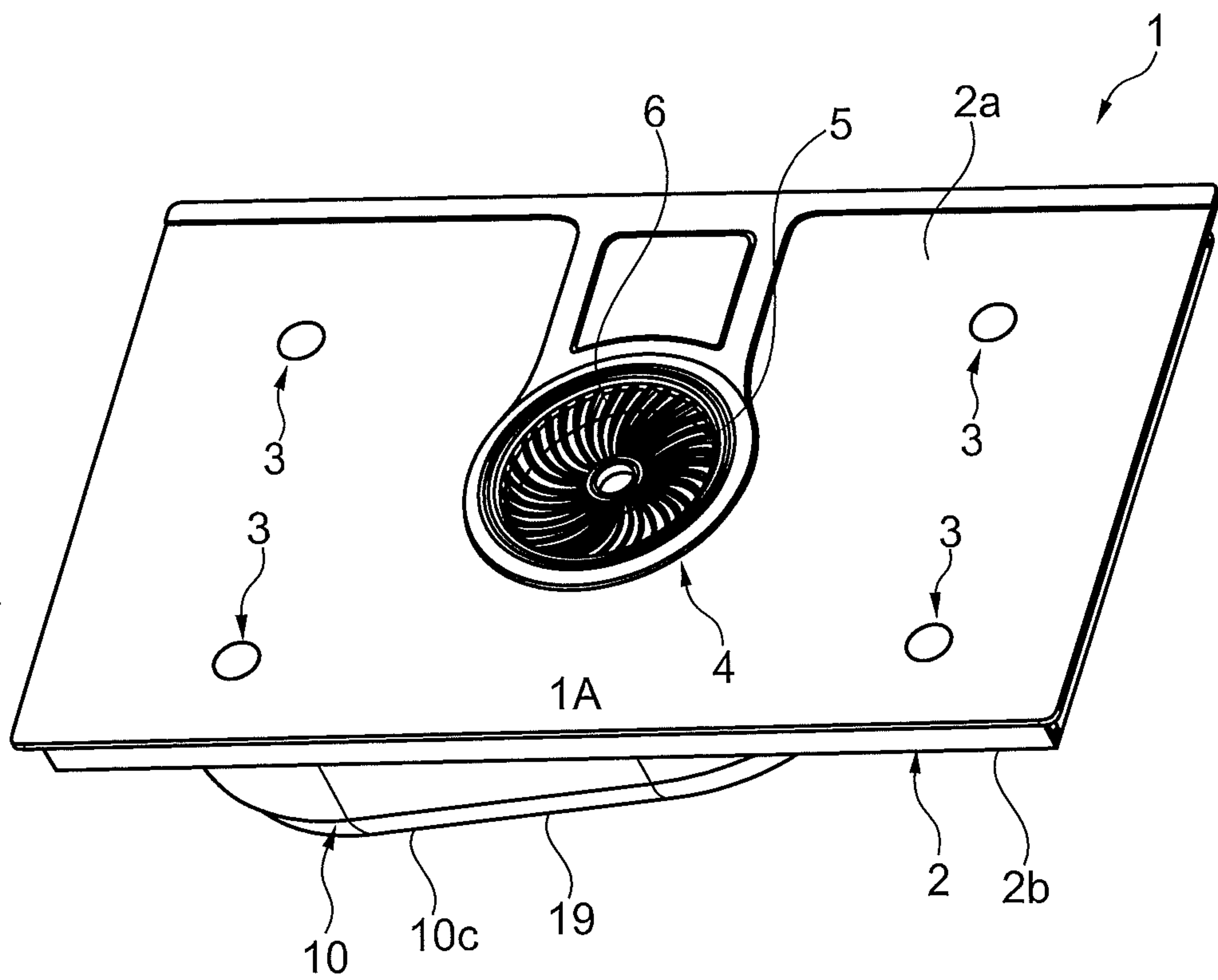


Fig. 1

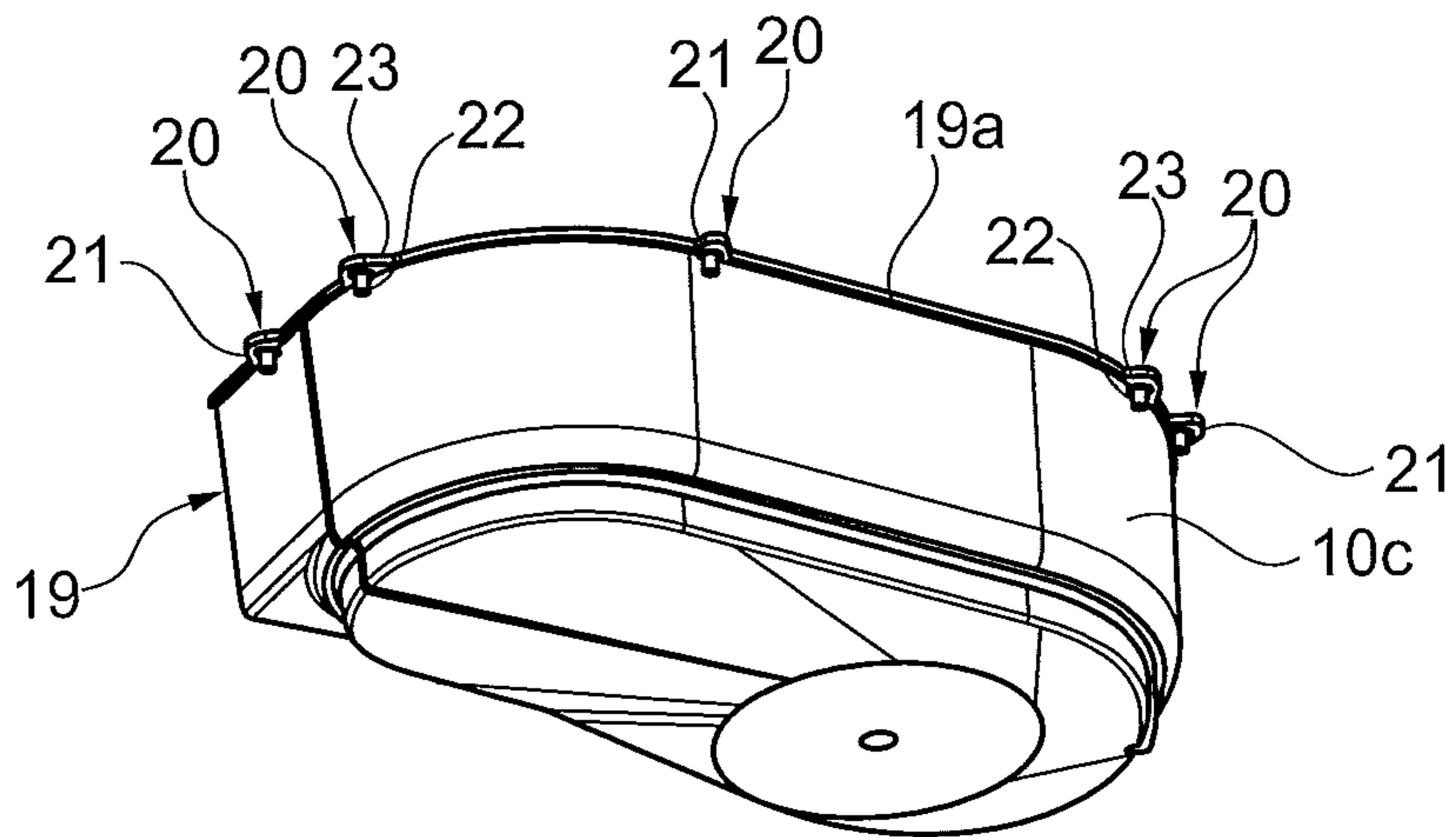
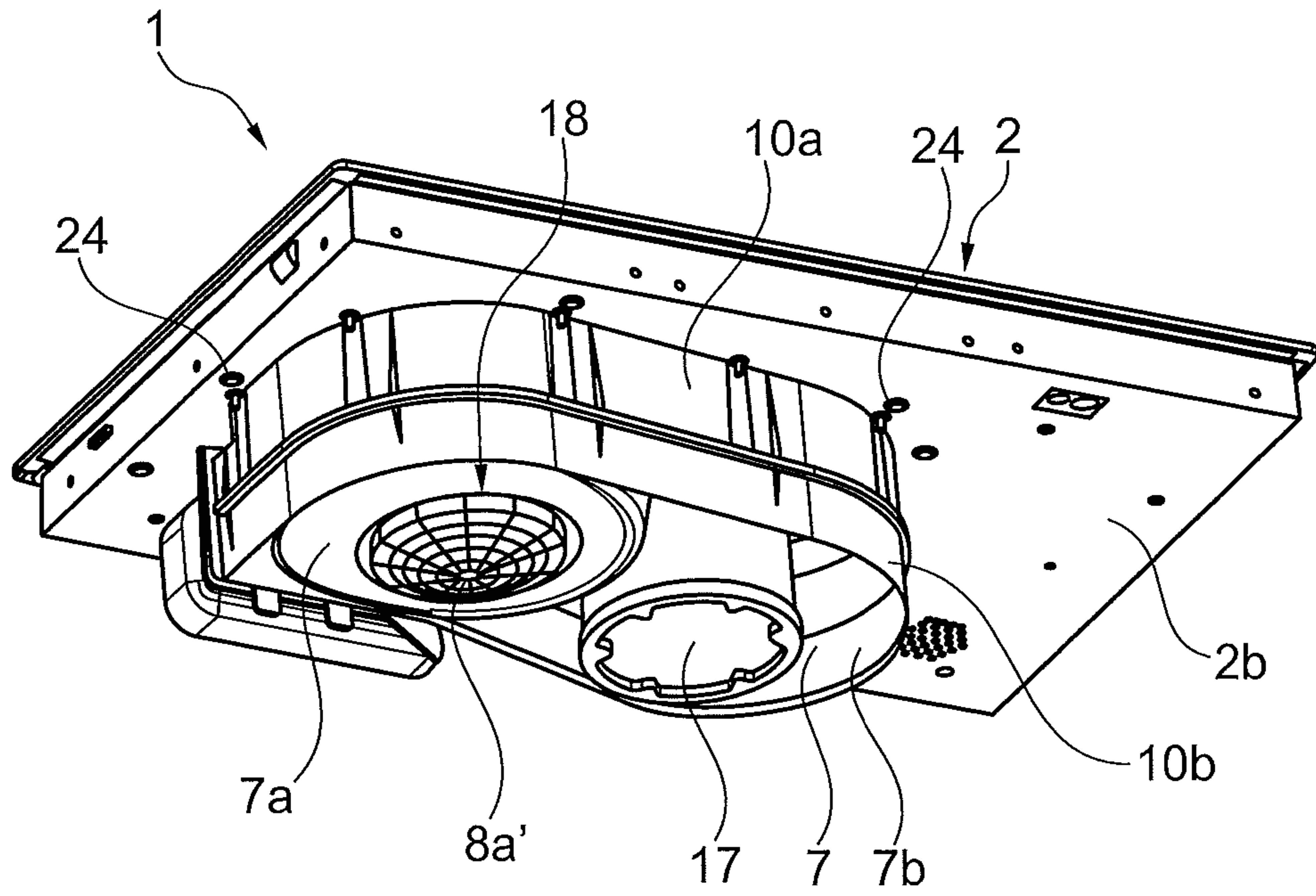


Fig. 2

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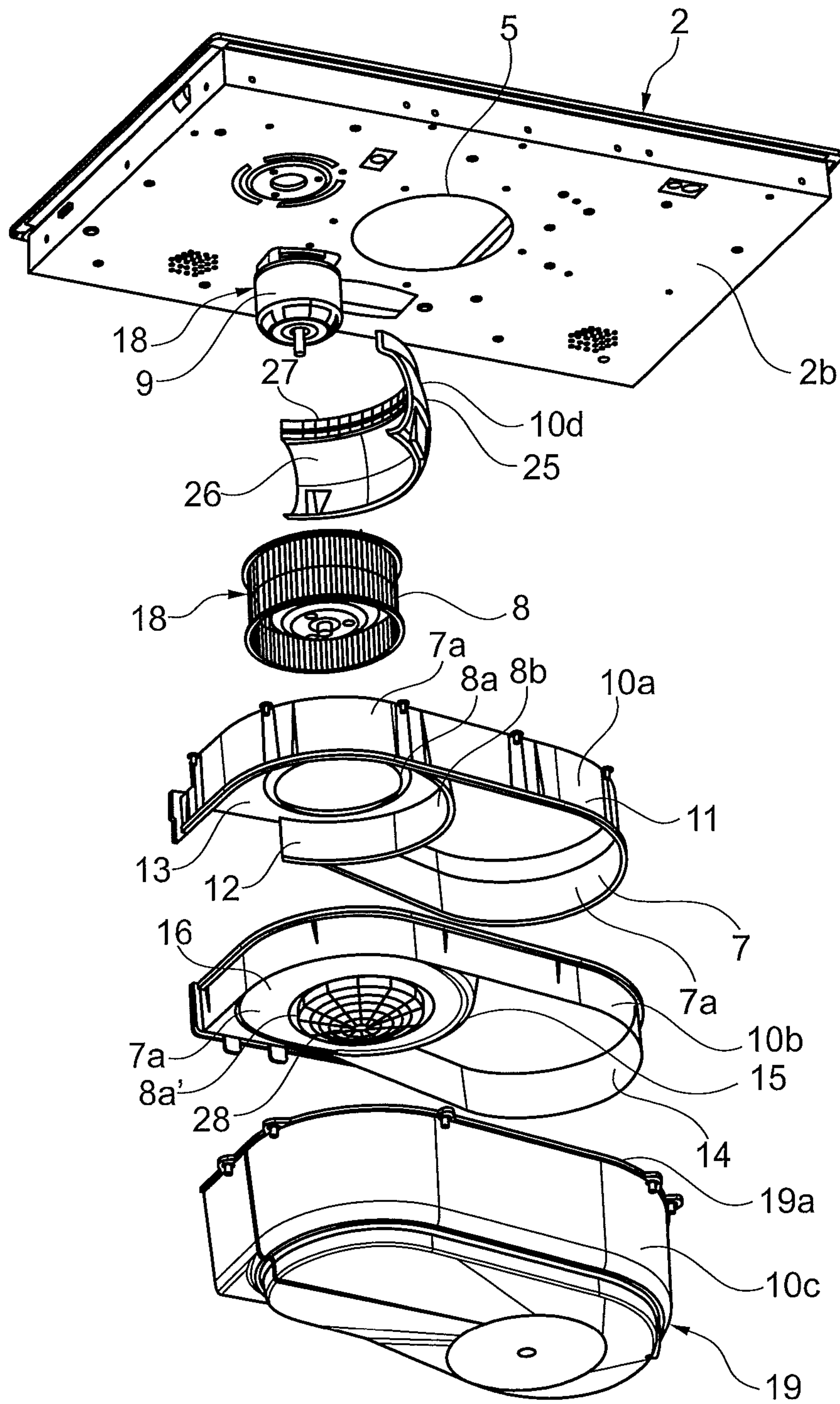


Fig. 3

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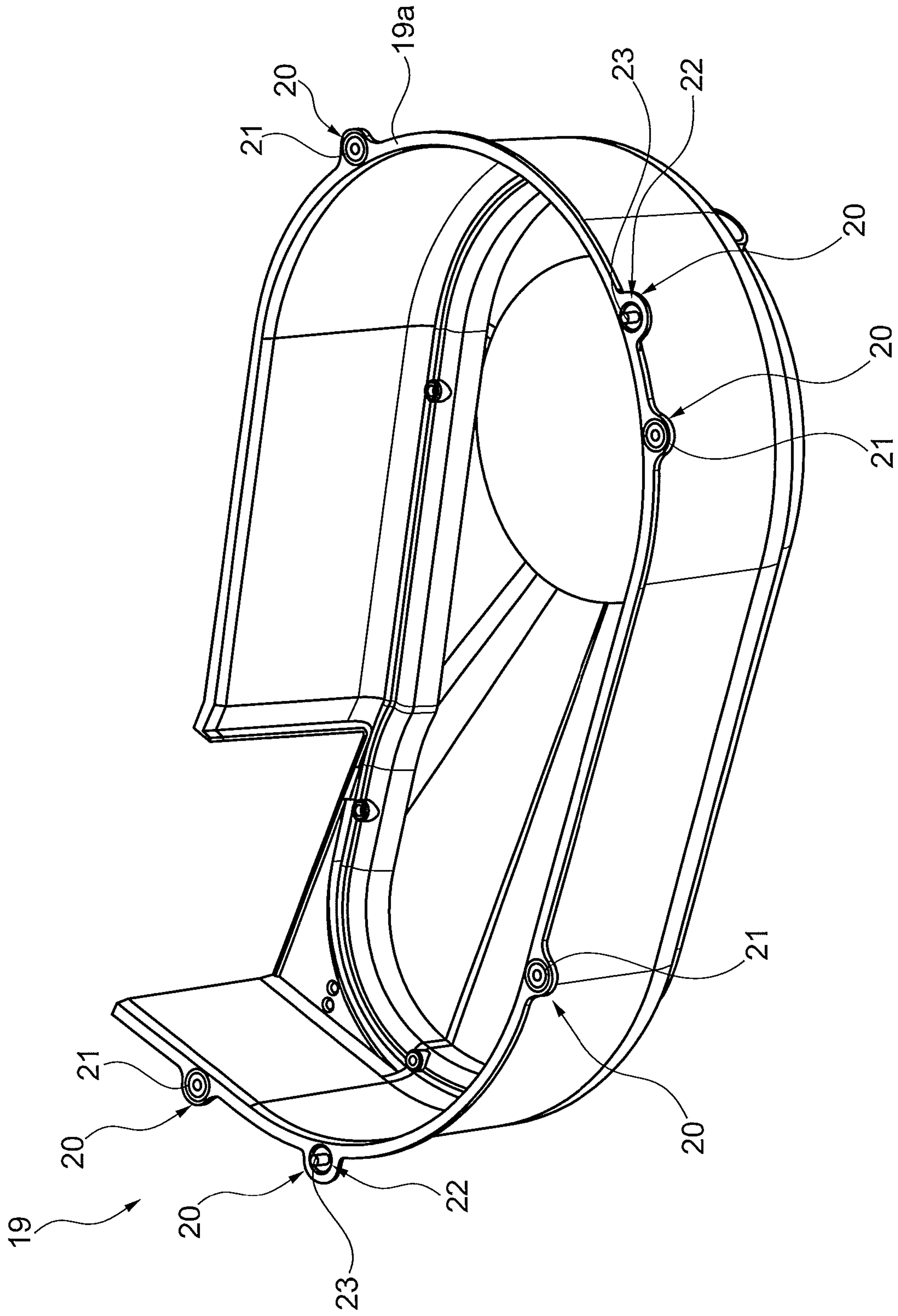


Fig. 4

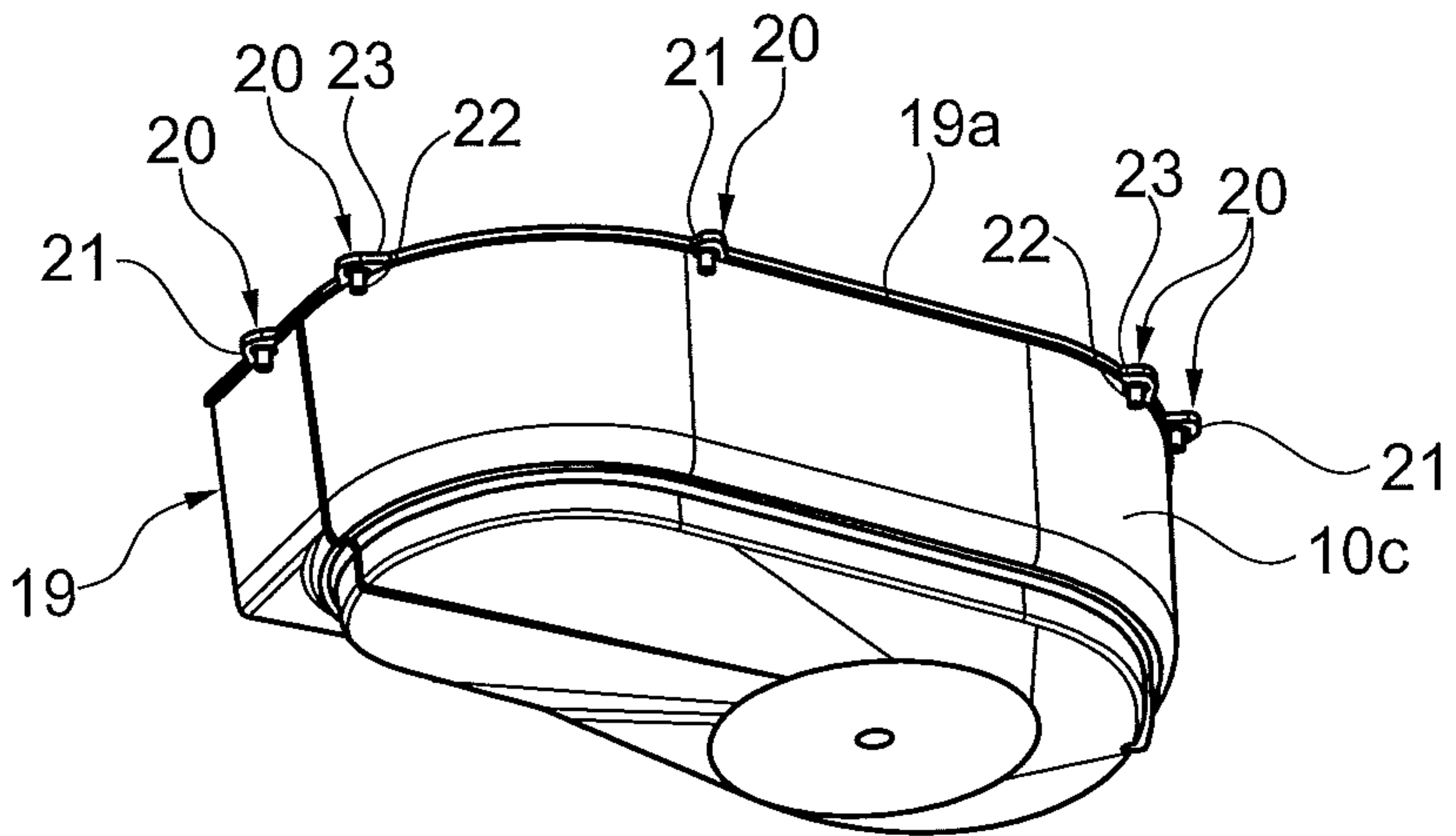
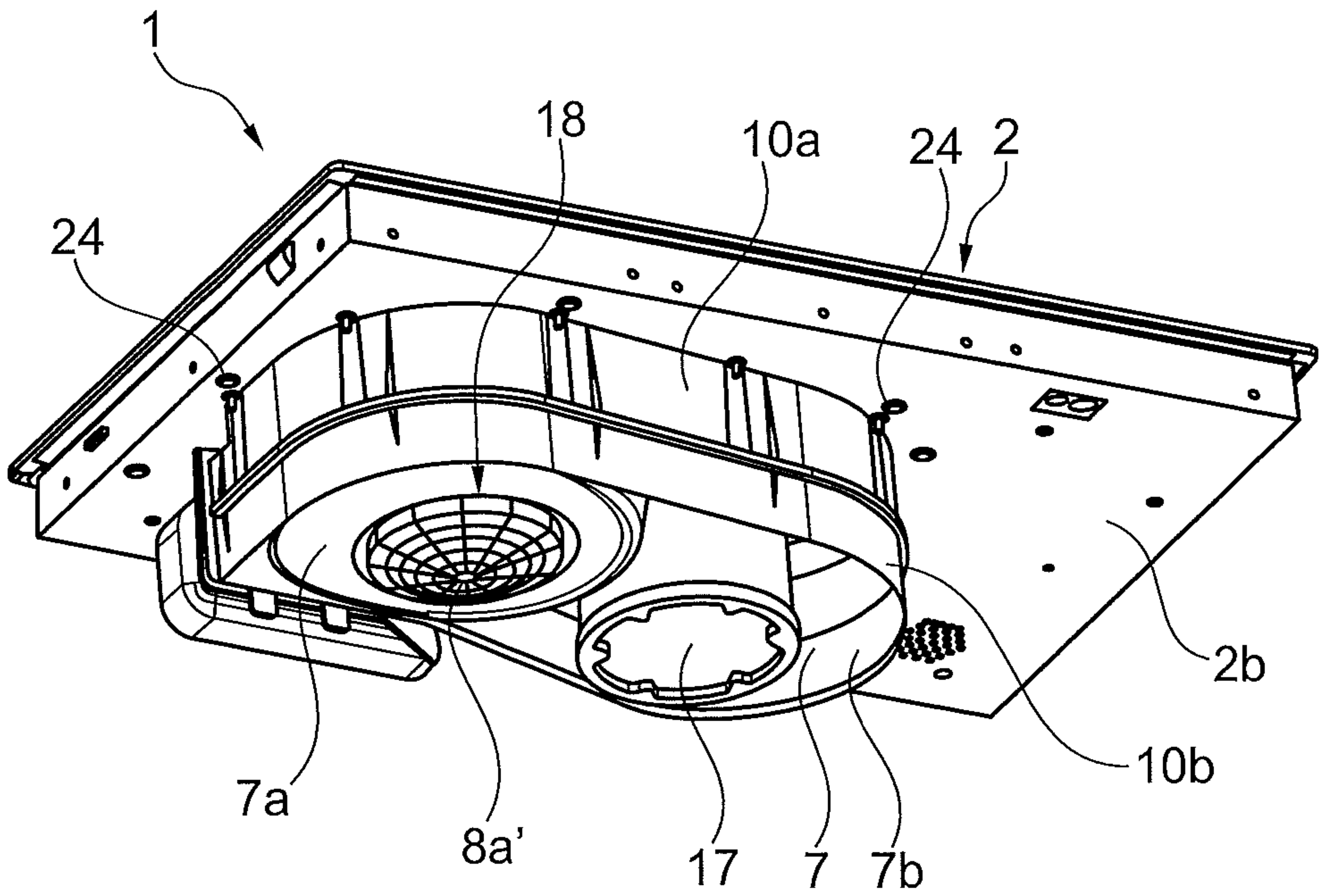


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