



(11) **EP 2 896 892 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**22.07.2015 Bulletin 2015/30**

(51) Int Cl.:  
**F24C 15/20 (2006.01)**

(21) Application number: **15151381.9**

(22) Date of filing: **16.01.2015**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**

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(30) Priority: **20.01.2014 IT PN20140003**

(54) **Extractor hood integrated in a hob**

(57) Extractor hood integrated in a kitchen hob comprising a container (2) of parallelepiped shape open at the top, and connected at the bottom to a powered extractor fan (4) suitable to extract cooking fumes and vapours; a movable part (1) containing filtering elements (8) and sliding vertically within said container (2) between a rest position in which it is completely inserted in said container (2) and an operating position in which it is extracted from the hob and an actuator (3) driven by a control unit to adjust the position of said movable part (1). The movable part (1) comprises a hopper-shaped conveyor (10) that extends downward with a first duct (11) suitable to slide telescopically and to be sealingly tight inside a second duct (13) fastened to the base (2B) of said container (2) and connected to said powered extractor fan (4).

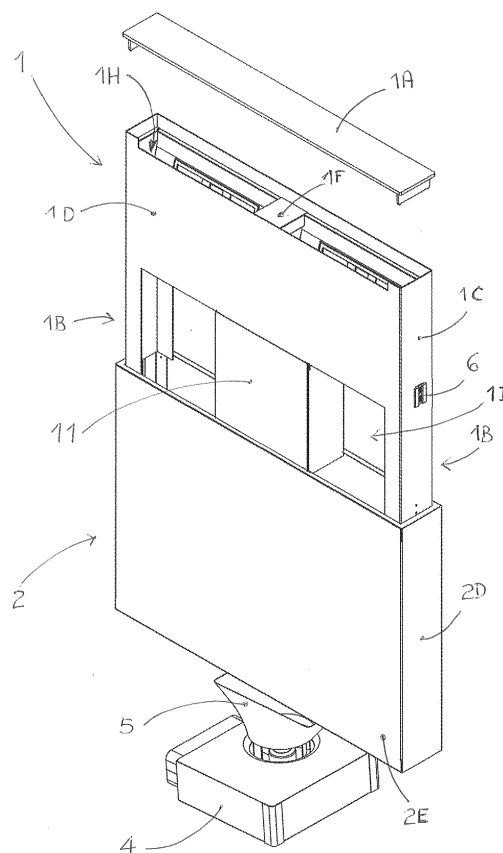


Fig. 1

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## Description

### TECHNICAL FIELD OF INVENTION

**[0001]** . The present invention relates to an extractor hood built into or integrated in the hob of a kitchen, fitted with powered fan for extracting fumes and vapours generated during the preparation and cooking of food. In particular, the invention refers to an extractor hood integrated in a hob.

### BACKGROUND OF THE INVENTION

**[0002]** . Solutions are already known that propound extractor hoods that can be arranged in a position between the recessed rest position and the protruding operating position, and that extract downward the fumes and vapours generated above the hob so as to recirculate them in the ambient atmosphere or vent them outside the kitchen environment after having filtered them.

The hoods of the prior art employ, as an outflow duct for fumes and vapours, an arrangement consisting of a container and a movable part that slides within it; in particular, some of said hoods feature gaskets installed on the contact edges to guarantee their airtightness and facilitate the extraction of the fumes.

**[0003]** . For example, the cooking apparatus described in patent application US2006/278215 illustrates a movable hood built into a cooking top and provided with gaskets within it.

A first gasket is located between the base of the housing of the movable element and the housing of a compressor, and a second gasket is used to seal the inner movable element and the hood housing to reduce air leaks.

**[0004]** . The American patent application US 2008/029081 also describes a retractable extractor hood integrated in a kitchen cooking top. The internal element can be sealed from the housing in which it slides so as to prevent air leaks. The sealing can be achieved by means of gaskets to reduce the gap between the internal element and the container fastened to the base.

**[0005]** . The American Patent Application US 2010/059040 describes the use of a gasket installed on the face of the hob inside the cabinet on the edge in contact with the movable part. The gasket has the double function of preventing the passage of dirt from the hob to the underlying space and of adjusting the extraction position of the movable part thanks to friction.

**[0006]** . All the teachings mentioned above seal the fixed container and, if necessary, feature gaskets installed on the perimeter of the movable part. The technical problems of these solutions are mainly of two types. Firstly, the space between the container and the movable part has an appreciable area and even the insertion of a gasket does not offer a valid solution to limit the leakages of air, fumes and vapours. The second problem is that the container has many other points where it is possible for air, smoke and vapours to leak through; these include

the holes made for fastening guides and conduits, in addition to the contact edges of the lateral surfaces which can be removed to access the internal devices for maintenance.

**[0007]** The sealing of all these points requires specific materials as well as long and complicated operations that increase operating times and costs.

### SUMMARY OF THE INVENTION

**[0008]** . The proposed solution employs a construction that is capable of extracting more effectively the fumes and vapours produced during cooking, overcoming the drawbacks of the prior art, thanks to the adoption of a duct of smaller cross section inside the hood that conveys the flow of fumes and vapours generated by the extractor motor. The internal duct reduces the flow resistance due to the leaks that can occur at the points of contact between the surfaces that form the fixed housing in which the movable part slides, or on the edges of holes necessary, for example, for mounting guides or other functional components designed for moving the movable part.

**[0009]** . Another purpose of the invention is to provide a hood of the above type that makes it possible to easily and readily extract the devices that control the lifting and lowering of the movable part.

**[0010]** . These and other objectives are achieved with the extractor hood equipped with a conduit the characteristics of which are defined in the claims at the conclusion of the present description.

### BRIEF DESCRIPTION OF THE FIGURES

**[0011]** . The technical characteristics of the invention will be described with the help of the accompanying figures which illustrate an embodiment purely by way of non limiting example, in which:

- Fig. 1 illustrates a perspective view of an embodiment of an extractor hood according to the present invention;
- Fig. 2 illustrates a perspective view of the hood of Fig. 1 from which the external surfaces have been removed so as to allow a view of the internal components;
- Fig. 3 is a perspective view of the movable part of the hood of Fig. 1.

### DETAILED DESCRIPTION OF THE INVENTION

**[0012]** . Figure 1 illustrates a preferred embodiment of the extractor hood integrated in the hob and designed to slide vertically according to the invention. Said embodiment features a structure generally of a parallelepiped shape, although with suitable modifications within the capabilities of a skilled technician in the field, this specification can be applied to other shapes, such as for example cylindrical extractor hoods.

**[0013]** . The perspective view illustrates the main elements of the extractor hood: a movable part 1 that slides vertically inside a container 2, a motorized extractor fan 4 connected through a connecting duct 5 to the bottom of said container 2.

**[0014]** . The container 2 includes a frame 2A (Fig. 2) on which is mounted a first surface 2B having at its centre an opening 2C necessary to communicate said container 2 with said connecting duct 5. A continuous lateral surface is made up of a pair of sides 2D, 2E that can be fastened with known means to the upright elements of said frame 2A. The remaining side, opposite to the first surface 2B, is open to allow the engagement and the vertical movement of said movable part 1.

**[0015]** . Guides 7 are mounted on the internal surface of said sides 2D of the container and are apt to engage corresponding elements 6 mounted on the movable part 1 in the manner described below.

**[0016]** . At least one of the sides 2E not provided with guides 7 is removable to allow access to the mechanisms of the extractor hood housed inside said container 2. Said removable side 2E, when it is placed in position to close the container 2, is fastened with known means on an edge 2F of said container 2.

**[0017]** . The connecting duct 5 is fastened externally to the container 2 at the opening 2C; the width of its face in contact with said container 2 is such as to provide an airtight mating along the edge of said opening 2C. Said connecting duct 5 also rotatably supports said motorized extractor fan 4.

**[0018]** . A fixed conduit 13 is mounted internally and coaxially to the container 2 on the wall 2B. The cross section of said fixed duct 13 is of such dimensions that its perimeter is fastened in an air-tight manner along the edge of said opening 2C. A free edge of said fixed conduit is bent inwardly so as to support a gasket 17 (Fig. 2, detail A).

**[0019]** . The movable part 1 is a supporting box-shaped parallelepiped structure having dimensions such as to be engaged slidably inside said container 2.

**[0020]** . A lateral surface of said movable part 1 is made up of a pair of larger closed sides 1D, two smaller sides 1C and two opposed openings (Fig. 1).

**[0021]** . From one of these two openings extend two extensions 1B (Fig 3) suitable to be engaged in said container 2 and create a space 11.

**[0022]** . The upper edge of at least one of said sides 1D has a profile shaped so as to create at least one opening 1H through which flow fumes and vapours drawn in by said motorized extractor fan 4 when the extractor hood is closed by an upper cover 1A.

**[0023]** . On the external face of said sides 1C is mounted a plurality of projecting tongues 6, or similar devices, suitable to engage said guides 7 to guide the vertical motion of said movable part 1 in said container 2.

**[0024]** . The upper portion of said movable part 1 contains filtering elements 8 to clean the vapours and fumes drawn in by said motorized extractor fan 4, support struc-

tures 9 for said filters 8 and a box-shaped element 1E.

**[0025]** . Said support structures 9 are closed within said movable part 1 so as to prevent the leakage of fumes or vapours.

5 **[0026]** . In an upper part of said box-shaped element 1E, closed at the top by a removable cover 1F, are contained mechanisms 1G for the fine adjustment of the position of said movable part 1, so that the upper surface of said cover 1A is coplanar with the surface of the hob  
10 when the extractor hood is in the rest position, that is, inserted into the container 2.

**[0027]** . In the upper portion of said movable part 1 is also contained a hopper-shaped conveyor 10, installed  
15 in such a position as to be crossed by the fumes that have already gone through said filtering elements 8.

**[0028]** . An edge of said conveyor 10 nearest the support structure 9 is fastened so as to adhere to the internal surface of said movable part 1 and prevent the leakage  
20 of the extracted fumes; on a free edge opposite said conveyor 10 is also air-tightly fastened a movable duct 11.

**[0029]** . Said movable duct 11 ends with an edge bent outwardly so as to support a gasket 12 (Fig. 2, detail A).

**[0030]** . With the extractor hood in a completely extracted position, said gasket 12 is in contact with said  
25 gasket 17 of the fixed conduit 13, so as to prevent the leakage of gases or vapours; otherwise, with said extractor hood in a not completely extracted position, the widths of the bent edges of the conduits 11 and 13 allow a flow of air to avoid the production of noise due to leakages  
30 during the procedure of closing the extractor hood, while the motorized extractor fan 4 is not yet stopped.

**[0031]** . The extractor hood of the present invention includes an actuator 3 to displace the movable part 1 vertically in response to control signals given by the user  
35 through a control unit normally known and not shown, such as a keyboard or a remote control unit.

**[0032]** . The actuator 3 comprises a first hollow internally threaded rod 3A; said rod 3A is driven by an electric motor (not shown) contained in its lower end, that is, near  
40 the side 2B of the container 2. On said lower end of the rod 3A is provided a through hole in which a pin 14 is engaged. The ends of said pin 14 project from the base of said rod 3A and engage holes 15 provided on the walls of the fixed conduit 13 and in corresponding positions on  
45 the frame 2A.

**[0033]** . A second rod 3B is threaded externally: a first end of the same is screwed into the first rod 3A and a second end is connected in said box-shaped element 1E of said movable part 1 through a second pin 16.

50 The rotation of the first rod 3A driven by the motor in a first direction makes the second rod 3B slide axially to displace the movable part 1 to the extracted position; vice versa, the rotation in the opposite direction makes the second rod 3B slide in the opposite direction and causes  
55 the movable part 1 to return into the container 2.

**[0034]** . In particular, as shown in the detail A of Fig. 2, the head of said rod 3B has a through hole, or eyelet, in which is engaged said second pin 16, the ends of which

are connected to opposite walls of said box-shaped element 1 E.

[0035] . As is shown in Fig. 2, the upper portion of the movable part 1, the conveyor 10, the movable duct 11 and the fixed duct 13 form a closed, air-tight path for the extracted fumes and vapours that conveys them from the surface of the hob to discharge or recirculating ducts through said motorized extractor fan 4.

[0036] . The lateral surfaces of all four components 1, 10, 11 and 13 are continuous and do not have any holes necessary to fasten elements such as the guides 7 or the container itself 2 to the structure of the hob. Moreover, the different sections that compose it are all joined to each other so as to prevent the leakage of fumes or vapours, for example by means of welding. The only exception results from the point of contact between the free edges of the movable duct 11 and of the fixed duct 13. The pressure loss at this point are however eliminated thanks to the presence of the gaskets 12 and 17 and to the limited extent of the contact area. Consequently, with the power of the motor being the same, it is possible to obtain a stronger suction or else it is possible to adopt motors of smaller power and size.

It thus becomes unnecessary to seal all the holes necessary for mounting the guides 7, as well as to apply gaskets on the edges of the removable panel 2E of the container 2.

[0037] . Moreover, the design choice of placing the actuator 3 in a coaxial position with all the elements 1, 10, 11 and 13 that form the conduit for the extracted fumes makes it possible to rotate the powered extractor fan 4 on a plane perpendicular to the common axis of said elements, so as to be orientated according to the spaces available in the support structure of the hob, to the position of the ducts necessary for discharging the fumes and vapours, or to the arrangement of the kitchen walls, without thereby negatively affecting the effectiveness of the fume extraction or requiring particular connections or processing solutions.

[0038] . The coaxial embodiment of the telescopic conduit entails another advantage over the extractor hoods currently available on the market. The absence of bends reduces flow resistance, with further positive effects on the reduction of the power and/or of the dimensions of the powered extractor fan 4.

[0039] . Naturally, the present invention is susceptible of numerous applications, modifications or variants, without departing from the scope of patent protection, as defined by the enclosed claims.

[0040] . Moreover, the materials and the equipment used for implementing the present invention, as well as the shapes and dimensions of the individual components, can be the most suitable according to the specific requirements.

## Claims

1. Extractor hood integrated in a kitchen work plan comprising:

- a parallelepiped container (2) open on top, and connected at the bottom with a suction motor (4) adapted to suck cooking fumes and vapors;
- a movable part (1) containing filtering elements (8) which slides vertically inside said container (2) between a rest position wherein it is fully inserted in said container (2) and an operating position wherein it is extracted from the kitchen work plan;
- an actuator (3) driven by a control unit to adjust the position of said movable part (1);

### characterized in that

said movable part (1) comprises a conveyor (10) hopper shaped, which extends inferiorly with a first duct (11) adapted to slide telescopically and sealed within a second duct (13) fixed to the base (2B) of said container (2) and connected to said suction motor (4).

2. Extractor hood integrated in a kitchen work plan according to claim 1, **characterized in that** a gasket (12) mounted on the lower free edge of said first duct (11) and a second gasket (17) mounted on the upper free edge of said second conduit (13) are in contact when said movable part (1) is extracted into operating position.
3. Extractor hood integrated in a kitchen work plan according to claim 1, **characterized in that** said movable part (1) extends downward on two opposite sides with extensions (1 B) which slide in said container (2), said extensions being guided by projecting tongues (6) which engage in respective guides (7).
4. Extractor hood integrated in a kitchen work plan according to claims 1 and 2, **characterized by** being closed at top by a removable cover (1 A), placed on top of said movable part (1) which contains an adjustment device (1 G) adapted to adjust the precise position of said movable part (1), so that an upper surface of said removable cover (1 A) is coplanar with a surface of the kitchen work plan when said movable part is in the rest position.
5. Extractor hood integrated in a kitchen work plan according to claim 3, **characterized in that** said actuator (3) is coaxially mounted to said second conduit (13) through a pin (14) which passes through said actuator's (3) base and engages on two opposing walls of said second duct (13) and said casing (2).
6. Extractor hood integrated in a kitchen work plan according to claim 5, **characterized in that** said actu-

ator (3) comprises a first hollow rod (3A) internally threaded and driven in rotation by an electric motor mounted at its lower end, and a second rod (3B) externally threaded and inserted into the first hollow rod (3A), an upper end of said second rod (3B) being fixed in a box element (1 E) of said movable part (1) by a pin (16).

7. Extractor hood integrated in a kitchen work plan according to claim 1, **characterized in that** said motorized aspirator (4) is placed on the same axis of said telescopic duct (11, 13) and supported by a connecting duct (5), fixed to the bottom of said container (2), so as to rotate with respect to its axis.
8. Extractor hood integrated in a kitchen work plan according to claim 1, **characterized in that** said filtering elements (8) are housed in position adjacent to each other.

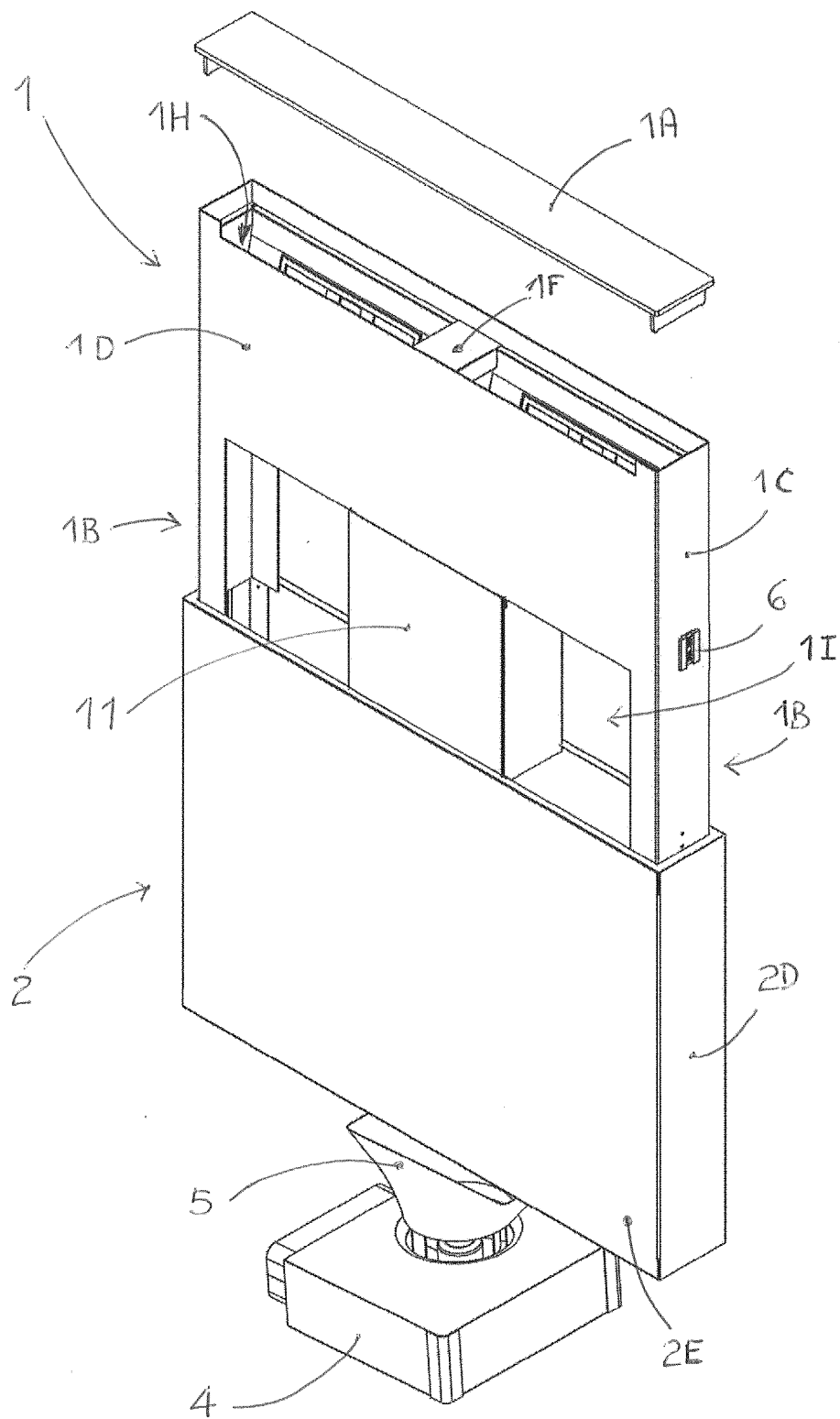
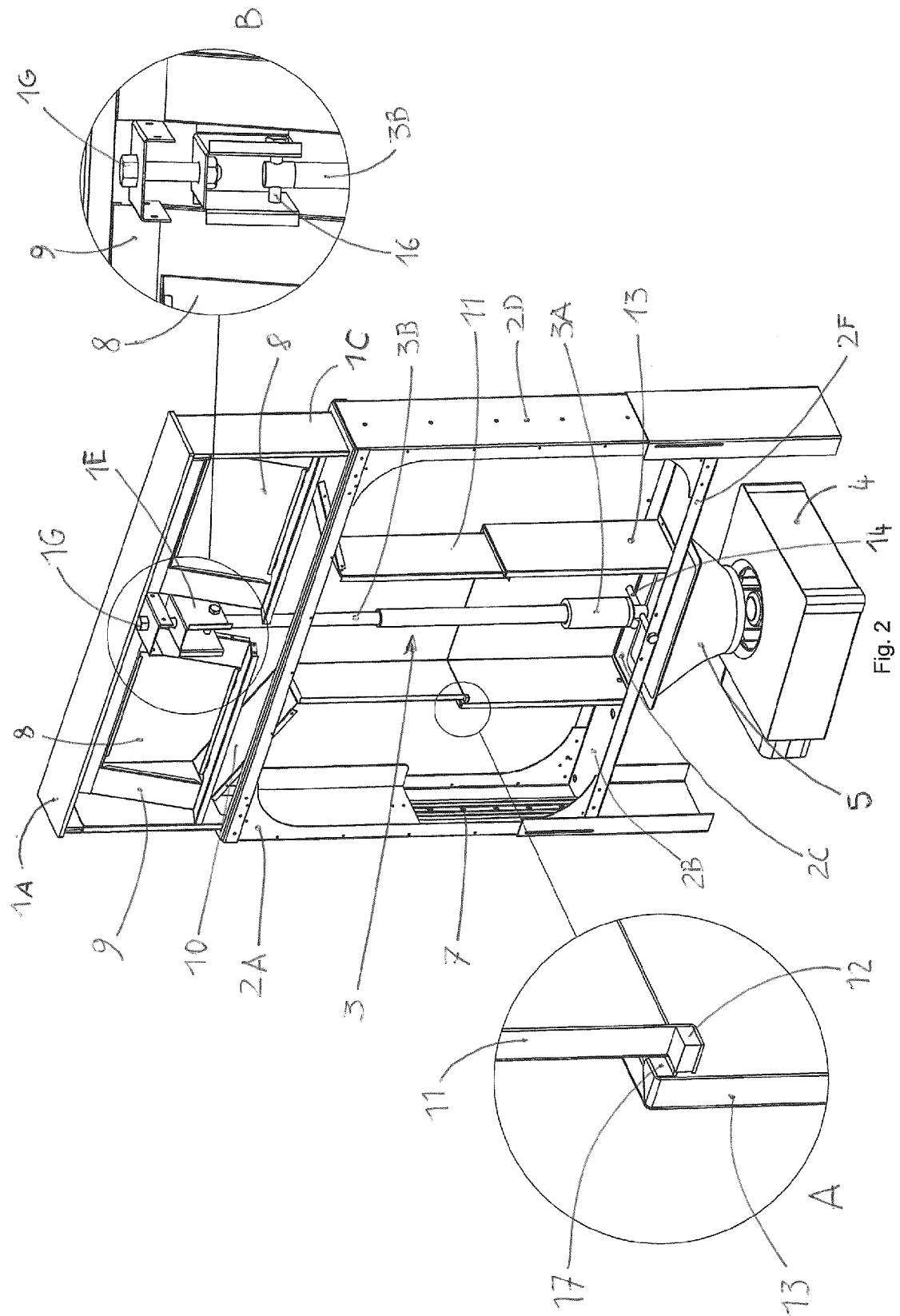


Fig. 1



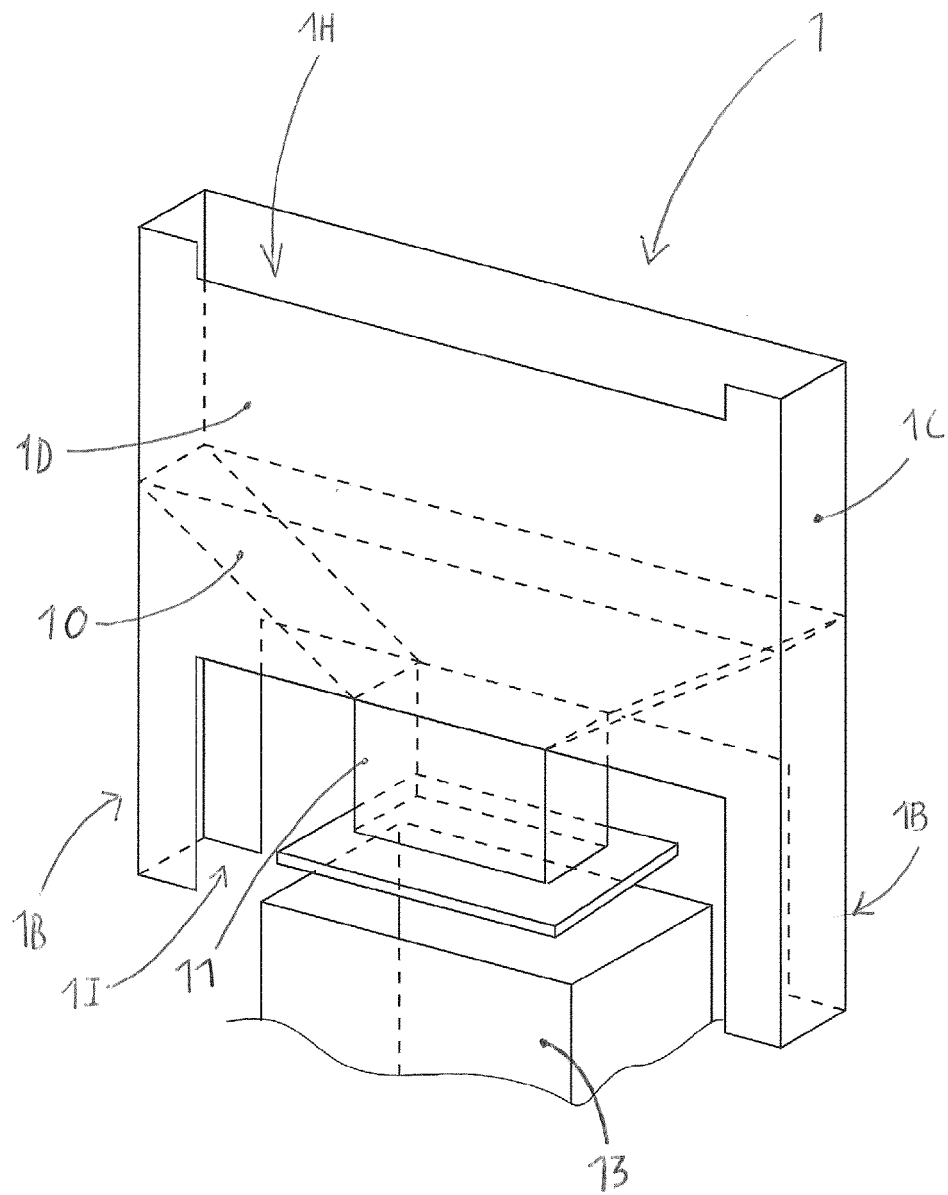


Fig. 3



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Application Number

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                      |                                  |                                         |
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| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                      |                                  |                                         |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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