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(11) **EP 4 517 191 A1**

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(54) **HOB DEVICE**

(57) The invention relates to a hob device comprising an odor filter assembly (114) wherein the odor filter assembly (114) comprises an odor filter housing (116) and at least one odor filter (118), and wherein the odor filter housing (116) has at least one abutment surface (116b) for lateral abutment of an associated odor filter (118). According to the invention the odor filter housing (116) has, in a lower section, at least one support surface (116a) for supporting a lower edge of an associated odor filter (118). Further, the odor filter housing (116) comprises latch connection means (116c) and the at least one odor filter (118) comprises latch connection counter means (118a) adapted and intended to cooperate with the latch connection means (116c) of the odor filter housing (116) to hold the at least one odor filter (118) to the odor filter housing (116). According to a second aspect, the odor filter housing (116) has, above the at least one support surface (116a) and at least partially within the at least one abutment surface (116b), a recess (116e) whose lower boundary surface forms a further support surface (116f) and whose lateral boundary surface forms a further abutment surface (116g).

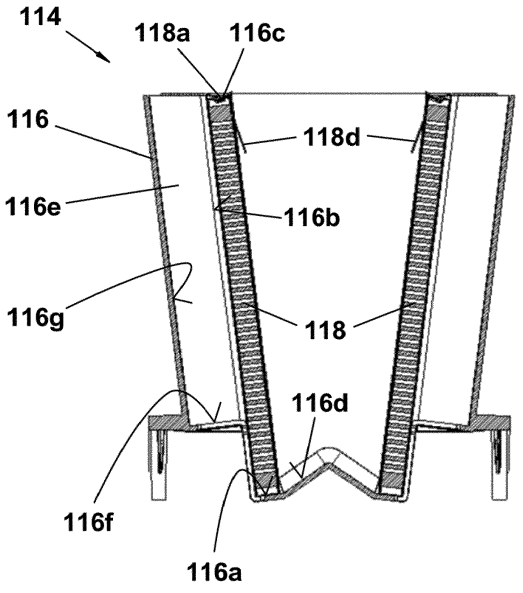

Fig. 4

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Description

[0001] The invention relates to a hob device comprising

- a hob having an opening,
- an extraction device arranged below the hob and having a fan for extracting cooking fumes from above the hob through the opening,
- an odor filter assembly disposed in the direction of flow of the cooking fumes between the opening and the fan,

wherein the odor filter assembly comprises an odor filter housing and at least one odor filter, and wherein the odor filter housing has at least one abutment surface for lateral abutment of an associated odor filter.

[0002] Hob devices of the afore-mentioned type having a downdraft cooking fume extraction device are well known in the art. Usually, the odor filter assembly of such hob devices are located in an area of the hob device, which is difficult to access. Consequently, it is difficult to ensure that after replacing an odor filter the odor filter is accurately located thus excluding any parasitic flow paths around the odor filter and thus jeopardizing the odor filter's function.

[0003] In view of the above, it is the object of the invention to provide a hob device of the afore-mentioned type, the odor filter assembly of which facilitates the replacement of the at least one odor filter.

[0004] According to the invention, this object is solved by a hob device of the afore-mentioned type in which the odor filter housing has, in a lower section, at least one support surface for supporting a lower edge of an associated odor filter, and in which the odor filter housing comprises latch connection means and the at least one odor filter comprises latch connection counter means adapted and intended to cooperate with the latch connection means of the odor filter housing to hold the at least one odor filter to the odor filter housing.

[0005] Based on this design, when replacing an odor filter, the odor filter can be inserted into the odor filter housing until its lower edge contacts the support surface, such that the odor filter is securely supported by the support surface. In this situation, the user can be sure that the lower edge of the odor filter is properly located. Thereafter, the odor filter can be pivoted around this support until it abuts against the abutment surface of the odor filter housing, the correct positioning of the odor filter being indicated by the snapping of the latch and latch connection counter means. This snapping can be perceived by the user both haptically by snapping vibrations and acoustically by a snapping sound. Thus, the user can be sure that the entire odor filter is properly located. Furthermore, the latch connection securely holds the odor filter against the odor filter housing.

[0006] In order to further facilitate the inserting of the odor filter into the odor filter housing, it is suggested that the odor filter housing has, adjacent to the at least one support surface, an insertion surface extending in an oblique manner in a direction away from the support surface and from the bottom to the top. This insertion surface forms a ramp guiding the odor filter to the correct position, thus assisting the user in prepositioning the odor filter. The user just needs to lower the odor filter into the odor filter housing, and once the odor filter touches the insertion surface, this surface will guide the odor filter simply by gravity to the correct position in which its lower edge is supported by the support surface.

[0007] In this context, it should be noted that if the odor filter assembly has two odor filters, the insertion surfaces associated with the support surfaces for the two odor filters can together form an inverted V-shaped arrangement. The vertex angle of the inverted V-shape may amount to between about 100° and about 120°, preferably to about 110°.

[0008] According to a further development of the invention, the latch connection means can be provided in a predetermined portion of the odor filter housing, namely in an upper portion or in at least one of the side portions of the odor filter housing, and the latch connection counter means can be provided in a portion of the at least one odor filter allocated to the predetermined portion of the odor filter housing. This design features ensures that the odor filter is securely held against the odor filter housing.

[0009] Preferably, the latch connection counter means can be arranged on a frame of the at least one odor filter.

[0010] According to a specific embodiment, the latch connection means can comprise at least one latching projection provided on one of the odor filter housing and the at least one odor filter and the latch connection counter means can comprise at least one associated latching recess formed on the respective other of the odor filter housing and the at least one odor filter.

[0011] In order to facilitate removing the odor filter from the odor filter housing, e.g. for cleaning purposes, it is suggested according to a further development of the invention that the at least one odor filter has at least one handle arranged in its upper portion. This handle, which may be formed as a grip tab and/or may be made from fabric, allows the user to grab the filter easily, pull in a horizontal direction, and the odor filter will be released from the latch connection and is now free to be removed.

[0012] Similar to the counter latch connection means, the at least one handle can be arranged on a frame or the frame of the at least one odor filter.

[0013] According to a further aspect, it is the object of the present invention to provide a hob device of the afore-mentioned type, which can be used together with different types of odor filters, thus providing an increased flexibility for the user.

[0014] According to this further aspect, this object is solved by a hob device of the afore-mentioned type, in which the odor filter housing has, above the at least one support surface and at least partially within the at least one abutment surface, a recess whose lower boundary

surface forms a further support surface and whose lateral boundary surface forms a further abutment surface. Odor filters usually may include activated carbon, which may have a variety of different structures. For example, it may be provided in the form of powder, pellets, bricks, and the like, which also has consequences for the design, and in particular the dimensions, of the corresponding odor filter. According to the further aspect of the invention, for which independent protection is sought, the odor filter housing provides, in addition to the first odor filter location defined by the support surface and the abutment surface, the afore-mentioned recess as a second odor filter location having different dimensions than the first odor filter location. As a consequence, odor filters of different design may be used with the odor filter housing according to the invention.

[0015] For example, the at least one odor filter can be dimensioned such that it is supported by the at least one support surface when its latch connection counter means cooperate with the latch connection means of the odor filter housing. However, the odor filter assembly may alternatively be used with an an odor filter which is dimensioned such that it is supported by the further support surface when its latch connection counter means cooperate with the latch connection means of the odor filter housing. In the directions extending substantially orthogonal to the direction in which cooking fumes are led through the odor filter the latter-mentioned odor filter may be smaller than the first-mentioned odor filter. In order to be nevertheless able to provide approximately the same amount of odor filtering material, it is further suggested that the at least one odor filter is dimensioned such that it protrudes from the further support surface when its latch connection counter means cooperate with the latch connection means of the odor filter housing.

[0016] In order to ensure the extraction of cooking fumes through the odor filter assembly, it is suggested that the further abutment surface is formed at least partially in the shape of a grid.

[0017] Advantageously, the at least one odor filter can be dimensioned such that it be removed through the opening, thus enabling its easy removal or replacement.

[0018] In order to prevent the at least one odor filter to be contaminated by grease particles included in the cooking fumes, it is suggested that it further comprises a grease filter assembly, which is arranged in the flow direction of the cooking fumes between the opening and the odor filter assembly. This grease filter assembly may be inserted in the opening. In this way, the cooking fumes first have to pass the grease filter before they come upon the odor filter assembly.

[0019] Advantageously, side walls of the odor filter housing can surround the opening but can be located underneath the edges of the hob defining the opening. Due to its size, the odor filter housing cannot be removed through the opening. In addition, the odor filter housing can be connected to the hob in such a way that it cannot be detached from the hob without using tools.

[0020] It should be noted that in the context of the invention terms like "upper", "lower", "below" and "above" refer to the usual operating condition of the hob device and its components.

[0021] In the following the invention will be explained in more detail referring to the attached drawings, in which

Figure 1 shows a schematic side view of a hob device according to the invention;

Figure 2 shows a perspective view of an odor filter assembly according to the invention;

Figure 3 shows a perspective view of an odor filter to the invention;

Figure 4 shows a schematic sectional side view of the odor filter housing in which a first type of odor filter is located;

Figure 5 shows a schematic sectional side view of the odor filter housing in which a second type of odor filter is located; and

Figure 6 shows a perspective view of a grease filter assembly which can be used in combination with the odor filter assembly according to the invention.

[0022] In Figure 1, a hob device according to the invention is generally designated 100. The hob device 100 comprises a hob 102 and a plurality of heating devices 104. Below the hob 102, an enclosure 106 is mounted. Furthermore, the hob 102 has an opening 108 connecting the space above the hob 102 with the interior of the enclosure 106. A fan 110 is located in the enclosure 106, thus allowing to extract cooking fumes from above the hob 102 downwards through the opening 108 and then through a grease filter assembly 112 and an odor filter assembly 114 before expelling them at the backside of the hob device 100.

[0023] The grease filter assembly 112 cleans the cooking fumes from any grease or oil particles entrained together with the extracted cooking fumes. The odor filter assembly 114, which in the direction of flow of the extracted cooking fumes is located downstream of the grease filter assembly 112, then further cleans the cooking fumes from any substances which might result in an unpleasant smell of the cleaned cooking fumes. For this purpose, the odor filter assembly 114 usually comprises activated carbon, while the grease filter assembly 112 usually includes a stretched metal mesh.

[0024] As may be seen from Figure 1, the fan 110 is located behind the grease filter assembly 112 and the odor filter assembly 114.

[0025] The core of present invention is the design of the odor filter assembly 114, which will be explained in more detail referring to Figures 2 to 5.

[0026] In the embodiment shown in Figure 2, the odor filter assembly 114 comprises an odor filter housing 116 and two odor filters 118.

[0027] As may be best seen from Figures 2 and 4, each of the odor filters 118 is supported by an associated support surface 116a of the odor filter housing 116 and abuts against an associated abutment surface 116b of the odor filter housing 116. In this position it is secured by cooperation of a latching projection 116c provided at an upper end of the odor filter housing 116 and a latching recess 118a (see Figure 3) provided at a frame 118b surrounding the stretched metal mesh 118c of the odor filter 118.

[0028] It should be noted that the latch connection might as well be provided at at least one of the side portions of the odor filter housing 116 and the odor filter(s) 118. Furthermore, the latching projection(s) might as well be provided at the odor filters 118, while the latching recess(es) could be provided at the odor filter housing 116.

[0029] In this context, it should be noted that the odor filter assembly 114 has two odor filters 118. The insertion surfaces 116d associated with the support surfaces 116a for the two odor filters 118 together form an inverted V-shaped arrangement, the vertex angle α of the inverted V-shape amounting to between about 100° and about 120°, preferably to about 110°.

[0030] In order to facilitate releasing the odor filter 118 from the latch connection, the odor filter 118 further comprises a handle 118d, which is attached to the frame 118b adjacent to the latching recess 118a. The user may grip this handle 118d through the opening 108 and simply pull the odor filter 118 away from the abutment surface 116b, thus overcoming the latch connection. Then the odor filter 118 can be removed through the opening 108.

[0031] As may be best seen from Figure 4, the odor filter housing 116 further comprises an oblique insertion surface 116d, which is located adjacent and directly connected to the support surface 116a. This insertion surface 116d facilitates the re-insertion of the odor filter 118. The insertion surface 116d forms a ramp guiding the odor filter 118 to the correct position. The user just needs to lower the odor filter 118 into the odor filter housing 116, and once the odor filter 118 touches the insertion surface 116d, this surface will guide the odor filter 118 simply by gravity to the correct position in which its lower edge is supported by the support surface 116a.

[0032] According to a further aspect of the invention, the odor filter housing 116 is designed such that it can be used with two different types of odor filters, namely a first type of odor filter 118 as is shown in Figure 4 or alternatively a second type of odor filter 118' as is shown in Figure 5.

[0033] To this end, the odor filter housing 116 has above the support surface 116a, and, as may be seen from Figure 2, and at least partially within the at least one abutment surface 116b, a recess 116e whose lower boundary surface forms a further support 116f surface and whose lateral boundary surface forms a further abutment surface116g.

[0034] As may be seen from Figure 5, the second type odor filter 118' analogously to the first type odor filter 118 a latch connection counter means 118a' adapted and intended to cooperate with the latch connection means 116c of the odor filter housing 116, as well as a handle 118d' facilitating its removal from the odor filter housing 116. Furthermore, the second type odor filter 118' protrudes from the further support surface 116f.

[0035] Referring to Figure 2, it is further to be noted that the further abutment surface 116g is formed at least partially in the shape of a grid, in order to allow the flow of cooking fumes therethrough.

[0036] Figure 2 further shows that the odor filter housing 116 has an arc-shaped extension 116h, thus widening, on the one side, its upper inlet opening 116i for cooking fumes, and providing, on the other side, a space below the arc-shaped extension 116h where the fan 110 can be arranged.

[0037] Figure 6 shows an exemplary embodiment of a grease filter assembly 112 having a grease filter housing 112a and two grease filters 112b which may be used in combination with the odor filter assembly 114, and may, in particular, be inserted through the opening 108 into the odor filter housing 116 after the odor filters 118 or 118', respectively, have been connected thereto.

Claims

1. A hob device (100) comprising

- a hob (102) having an opening (108),
- an extraction device arranged below the hob (102) and having a fan (110) for extracting cooking fumes from above the hob (102) through the opening (108),
- an odor filter assembly (114) disposed in the direction of flow of the cooking fumes between the opening (108) and the fan (110),

wherein the odor filter assembly (114) comprises an odor filter housing (116) and at least one odor filter (118, 118'), and

wherein the odor filter housing (116) has at least one abutment surface (116b; 116g) for lateral abutment of an associated odor filter (118, 118'), **characterized in that** the odor filter housing (116) has, in a lower section, at least one support surface (116a; 116f) for supporting a lower edge of an associated odor filter (118, 118'), and **in that** the odor filter housing (116) comprises latch connection means (116c) and the at least one odor filter (118) comprises latch connection counter means (118a) adapted and intended to cooperate with the latch connection means (116c) of the odor filter housing (116) to hold the at least one odor filter (118, 118') to the odor filter

housing (116).

2. The hob device according to claim 1, **characterized in that** the odor filter housing (116) has, adjacent to the at least one support surface (116a), an insertion surface (116d) extending in an oblique manner in a direction away from the support surface (116a) and from the bottom to the top.

3. The hob device according to claim 1 or claim 2, **characterized in that** the latch connection means (116c) are provided in a predetermined portion of the odor filter housing (116), namely in an upper portion or in at least one of the side portions of the odor filter housing (116), and the latch connection counter means (118a) are provided in a portion of the at least one odor filter (118; 118') allocated to the predetermined portion of the odor filter housing (116).

4. The hob device according any of claims 1 to 3, **characterized in that** the latch connection counter means (118a) are arranged on a frame (118b) of the at least one odor filter (118; 118').

5. The hob device according any of claims 1 to 4, **characterized in that** the latch connection means (116c) comprise at least one latching projection provided on one of the odor filter housing (116) and the at least one odor filter (118; 118')and the latch connection counter means (118a) comprise at least one associated latching recess formed on the respective other of the odor filter housing (116) and the at least one odor filter (118; 118').

6. The hob device according any of claims 1 to 5, **characterized in that** the at least one odor filter (118) has at least one handle (118d) arranged in its upper portion.

7. The hob device according to claim 6, **characterized in that** the at least one handle (118d) is arranged on a frame or the frame of the at least one odor filter (118; 118').

8. The hob device according to the preamble part of claim 1 and, if desired, the characterizing part of any of the preceding claims, **characterized in that** the odor filter housing (116) has, above the at least one support surface (116a) and at least partially within the at least one abutment surface (116b), a recess (116e) whose lower boundary surface forms a further support surface (116f) and whose lateral boundary surface forms a further abutment surface (116g).

9. The hob device according to claim 8, **characterized in that** the at least one odor filter (118) is dimensioned such that it is supported by the at least one support surface (116a) when its latch connection counter means (118a) cooperate with the latch connection means (116c) of the odor filter housing (116).

10. The hob device according to claim 8, **characterized in that** the at least one odor filter (118') is dimensioned such that it is supported by the further support surface (116f) when its latch connection counter means (118a') cooperate with the latch connection means (116c) of the odor filter housing (116).

11. The hob device according to claim 10, **characterized in that** the at least one odor filter (118') is dimensioned such that it protrudes from the further support surface (116f) when its latch connection counter means (118a') cooperate with the latch connection means (116c) of the odor filter housing (116).

12. The hob device according any of claims 8 to 11, **characterized in that** the further abutment surface (116g) is formed at least partially in the shape of a grid.

13. The hob device according any of claims 1 to 12, **characterized in that** the at least one odor filter (118; 118') is dimensioned such that it be removed through the opening (108).

14. The hob device according any of claims 1 to 13, **characterized in that** it further comprises a grease filter assembly, which is arranged in the flow direction of the cooking fumes between the opening and the odor filter assembly.

15. The hob device according any of claims 1 to 14, **characterized in that** side walls of the odor filter housing surround the opening but are located underneath the edges of the hob defining the opening.

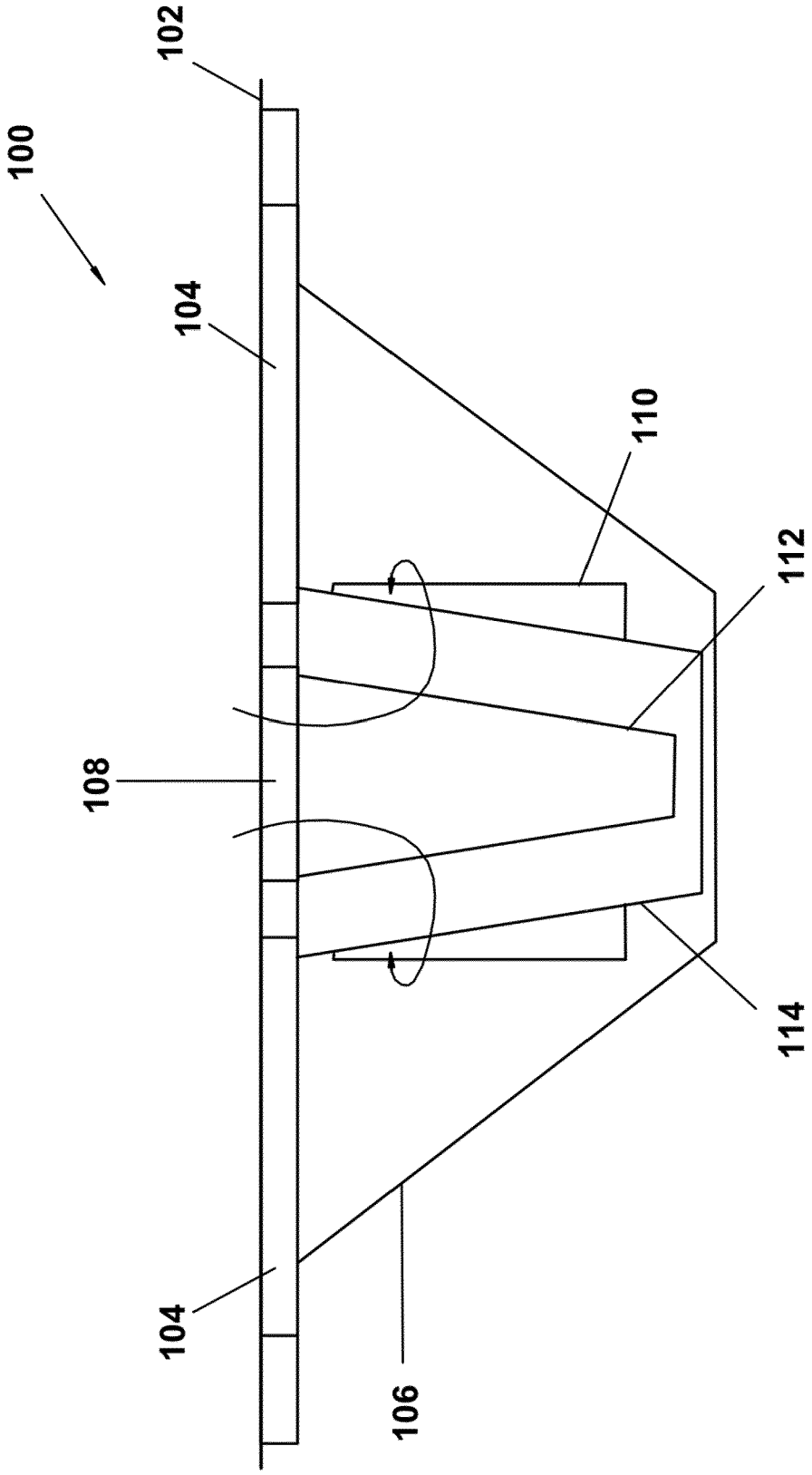

Fig. 1

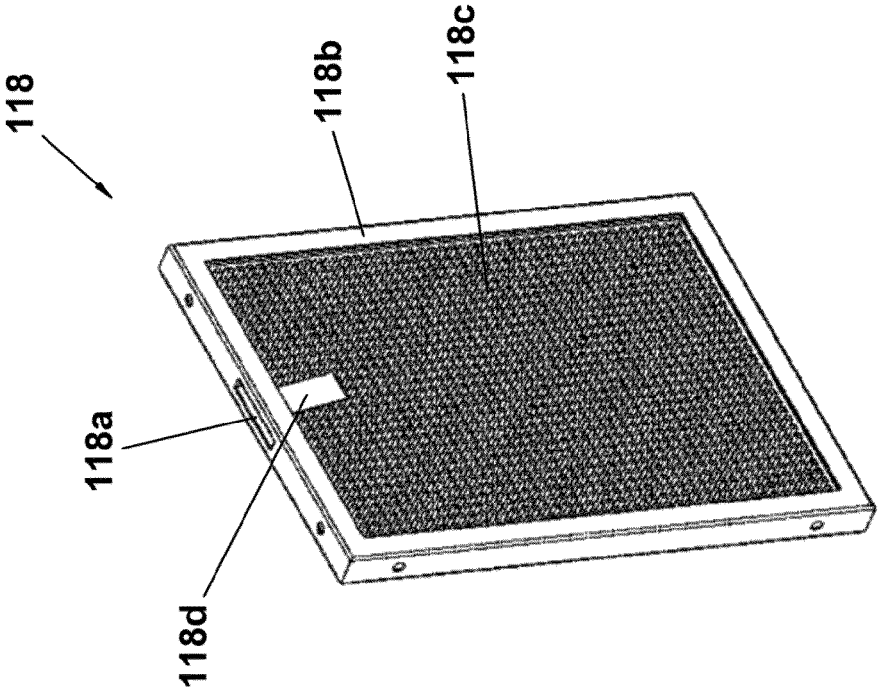

Fig. 3

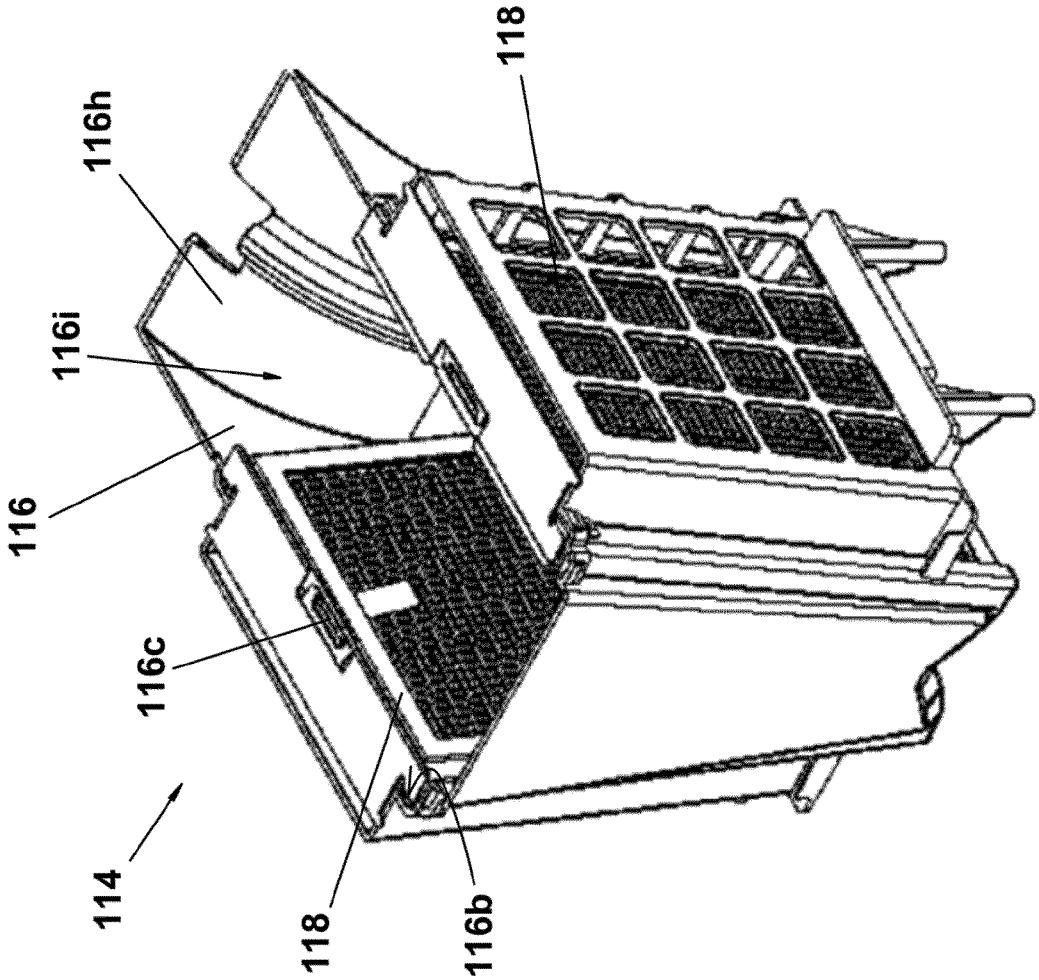

Fig. 2

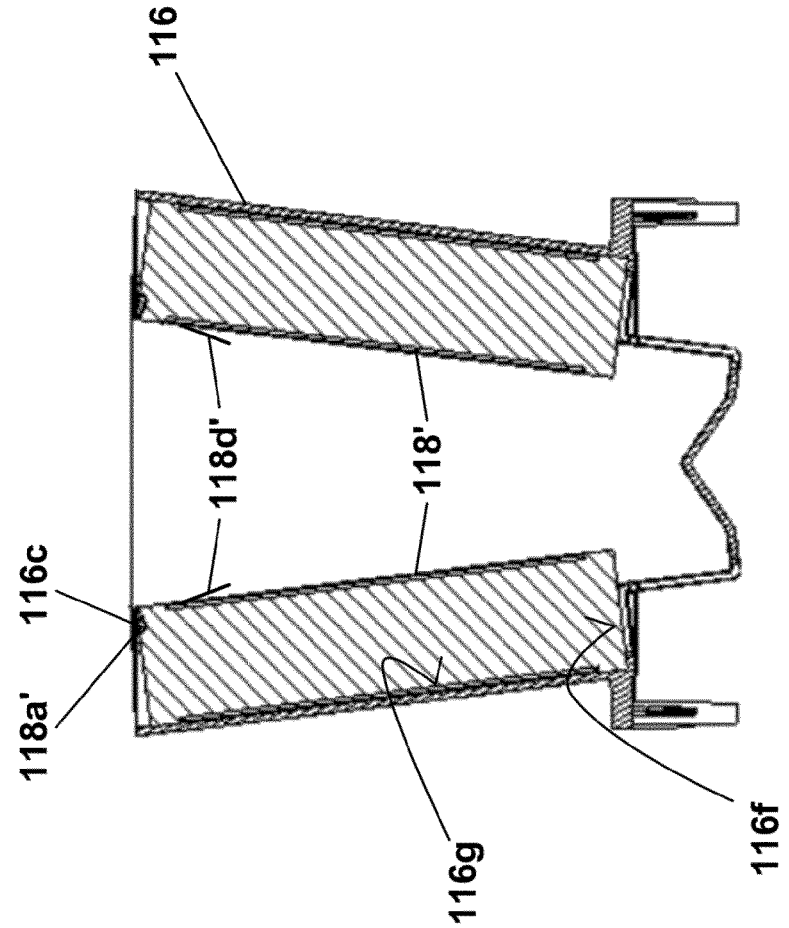
116
118d'
118'
116c
118a'
116g
116f

Fig. 5

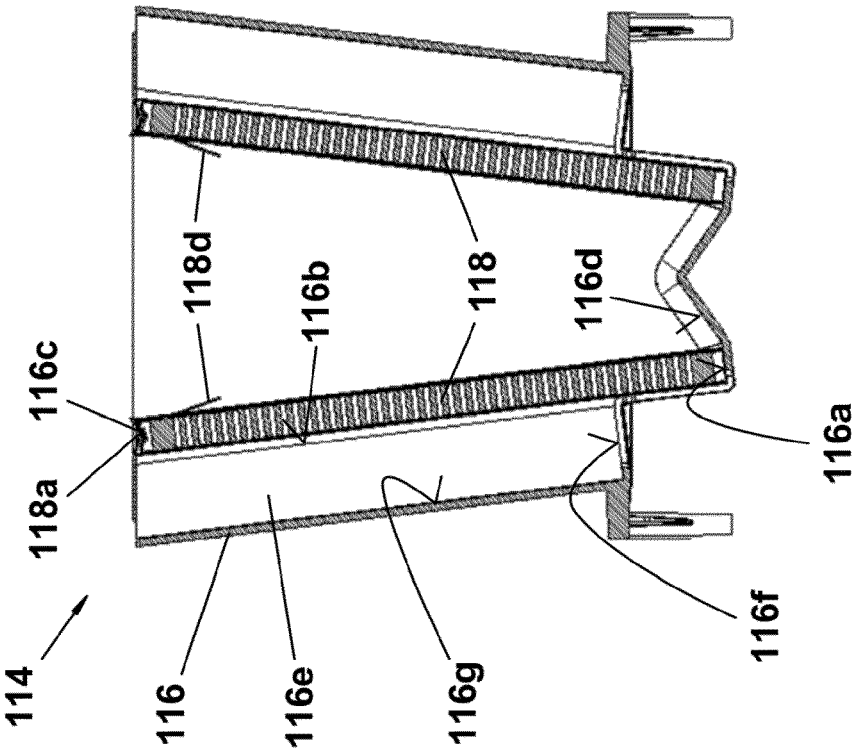
118d
116b
118
116d
116c
118a
116a
114
116
116e
116g
116f

Fig. 4

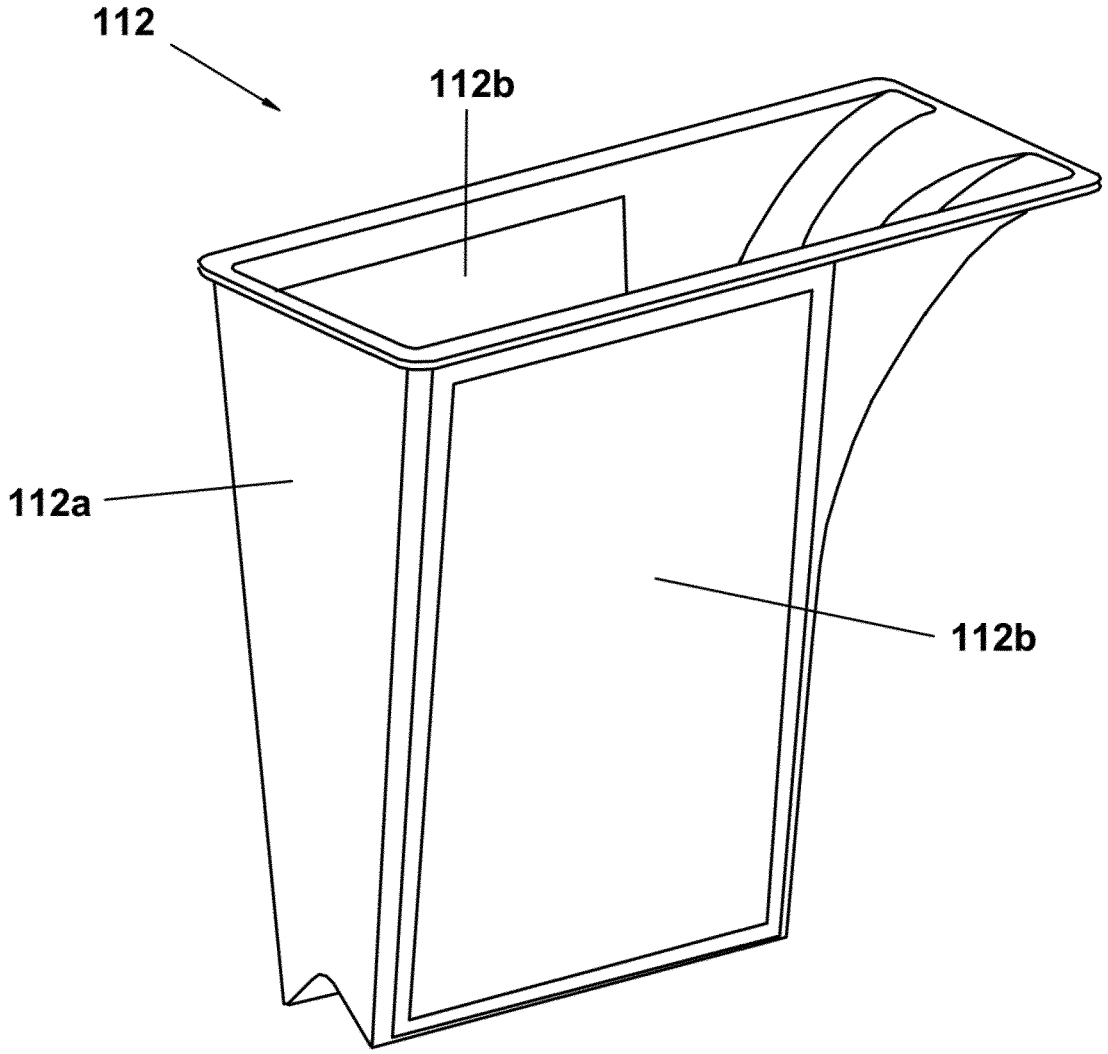

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 23 19 3730

DOCUMENTS CONSIDERED TO BE RELEVANT

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 May 2024	Verdoodt, Luk

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

& : member of the same patent family, corresponding document

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Application Number
EP 23 19 3730

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 23 19 3730

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7, 13-15

A hob device having an odor filter housing (116) wherein said housing has, adjacent to the at least one support surface (116a), an insertion surface (116d) extending in an oblique manner in a direction away from the support surface (116a) and from the bottom to the top.

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2. claims: 8-12

A hob device having an odor filter housing (116), wherein said housing has, above the at least one support surface (116a) and at least partially within the at least one abutment surface (116b), a recess (116e) whose lower boundary surface forms a further support surface (116f) and whose lateral boundary surface forms a further abutment surface (116g).

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 23 19 3730

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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