

(19)



(11)

**EP 3 473 936 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**24.04.2019 Bulletin 2019/17**

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

(21) Application number: **17197051.0**

(22) Date of filing: **18.10.2017**

(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**  
Designated Validation States:  
**MA MD**

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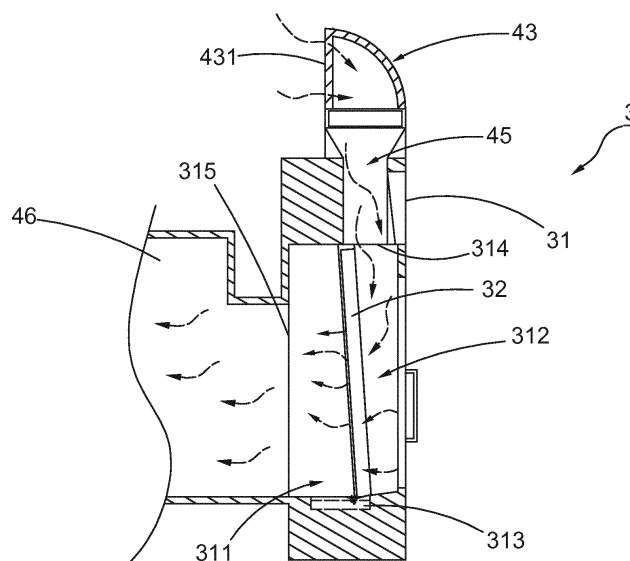
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**(54) COOKING APPARATUS WITH FILTERING ASSEMBLY**

(57) A cooking apparatus (4) with filtering assembly (3) includes a base (41) having a cooking area (42) disposed thereon, an intake cover (43) facing the cooking area (42), a filtering assembly (3) and an exhaust fan (44) disposed within the base (41) respectively. The filtering assembly (3) includes a collecting case (31) having a room (31A) with a large space and a filter (32) disposed in the room (31A) for dividing the collecting case (31) into a discharge area (311) and a filtering area (312), thereby

allowing the extensively-disposed filter (32) to increase an area available of filtering dirt and oil in fumes and decrease the wind resistance. A collecting trough (313) is formed on a bottom of the collecting case (31) for gathering the dirt and oil to prevent the filter (32) from getting obstructed. The discharge area (311) accommodates the filtered fumes temporarily and releases the filtered fumes gradually to reduce air extrusion. Therefore, the filtering efficiency is increased.

**FIG. 5****EP 3 473 936 A1**

## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

[0001] This invention relates to a fumes filtering device and relates particularly to a cooking apparatus equipped with a filtering assembly.

#### 2. Description of the Related Art

[0002] Generally, apparatuses for use in cooking, such as Teppanyaki apparatus, grilling apparatus or frying apparatus, are equipped with fumes filtering devices to filter and gather fumes occurred when cooking ingredients. Here takes a Teppanyaki assembly 2 as an example.

[0003] Referring to Fig. 1, a conventional Teppanyaki assembly 2 includes a base 21, a cooking area 22 fitted on the base 21, an intake cover 23 mounted on the base 21 and having a mouth 231 open to face the cooking area 22, an exhaust fan 24 fitted in the base 21, a filtering device 1 communicating with the intake cover 23 and the exhaust fan 24, an intake channel 25 formed between the mouth 231 of the intake cover 23 and the filtering device 1, and an exhaust channel 26 formed between the filtering device 1 and the exhaust fan 24. The filtering device 1 has a body 11, an accommodation space 12 formed in the body 11 in communication with the intake channel 25, an intake opening 13 communicating with the intake channel 25 and the accommodation space 12, an exhaust opening 14 communicating with the exhaust channel 26 and the accommodation space 12, and a filtering net 15 fitted on the exhaust opening 14.

[0004] Referring to Fig. 1, in use of the filtering device 1 of the Teppanyaki apparatus 2, the exhaust fan 24 is activated to carry out the motion of air, namely the air current movement, firstly. The suction operation of the exhaust fan 24 affects the motion of air around the cooking area 22 in consequence the accommodation space 12 communicates with the exhaust fan 24 and the intake cover 23. Hence, fumes flowing around the cooking area 22 caused by heating ingredients are absorbed into the accommodation space 12 from the mouth 231 of the intake cover 23 through the intake opening 13 and the intake channel 25. The fumes are further filtered by the filtering net 15 before entering into the exhaust channel 26 to intercept dirt and oil in the fumes. The filtered fumes are then discharged to the outside through the exhaust channel 26 to complete the filtering operation of the fumes.

[0005] However, the conventional filtering device 1 still has problems. First, the filtering device 1 collects the oil and dirt in the fumes ineffectively. At an early period of the filtering operation, the fumes can be absorbed into the accommodation space 12 from the mouth 231 of the intake cover 23 and filtered by the filtering net 15 to achieve the filtering operation because the filtering net

15 is clean without getting obstructed by the oil and dirt. However, the ineffectively-collected oil and dirt in the fumes adhere to meshes of the filtering net 15 after a long use of the filtering net 15 to result in the obstructed filtering net 15. Therefore, the meshes of the filtering net 15 become smaller to hinder the fumes from entering and result in poor suction effect of the exhaust fan 24. Thus, the fumes flowing around the cooking area 22 are absorbed and filtered ineffectively. Further, the accommodation space 12 is not large enough to accommodate a great quantity of the fumes simultaneously to cause parts of the fumes to diffuse around dinning places and result in poor dinning environment.

[0006] Second, the oil and dirt adhered to the filtering net 15 and the accommodation space 12 are difficult to be removed because the oil and dirt in the fumes are thick materials. Meanwhile, the accommodation space 12 is too narrow for cleaning completely when the oil and dirt stick to a surface thereof. Hence, the oil and dirt adhered to the filtering net 15 and the accommodation space 12 hinder the fumes from entering to result in the ineffective filtering operation and reduced suction effect of the exhaust fan 24. Hence, the conventional filtering device 1 needs to be improved.

### SUMMARY OF THE INVENTION

[0007] The object of this invention is to provide a cooking apparatus with filtering assembly having an enlarged room to allow an extensively-disposed filter and a discharge area to temporarily accommodate fumes to reduce wind resistance, attain smooth filtering effect and increase filtering efficiency.

[0008] The cooking apparatus with filtering assembly of this invention includes a base, a cooking area fitted thereon, an intake cover facing the cooking area, an exhaust fan connected to the base, a filtering assembly communicating with the intake cover and the exhaust fan, an intake channel formed between the intake cover and the filtering assembly, and an exhaust channel formed between the filtering assembly and the exhaust fan. The filtering assembly includes a collecting case provided with a room with a large space and a filter extensively fitted in the room for dividing the collecting case into a discharge area and a filtering area. The collecting case includes at least one collecting trough fitted on a bottom thereof and situated relative to the filter, an intake opening in communication with the intake channel and the filtering area, and an exhaust opening in communication with the exhaust channel and the discharge area. Hence, the room allows an extensive disposition of the filter to increase an area available of filtering fumes, thereby filtering fumes smoothly without any difficulties when the fumes are absorbed by the suction effect of the exhaust fan and reducing the resistance occurred during the suction operation effectively. Meanwhile, the collecting trough assists in gathering dirt and oil to prevent the filter from getting obstructed. Further, the discharge area

can contain the filtered fumes temporarily and release the filtered fumes gradually to prevent the filtered fumes from extruding the exhaust channel, thereby reducing the wind resistance and attaining the smooth filtering effect. Thus, the filtering efficiency is increased.

[0009] Preferably, a controlling set is disposed on the exhaust opening. The controlling set has a track spaced from the filter and a gate slidably mounted on the track to control an opening state of the exhaust opening.

[0010] Preferably, the filter is slantingly disposed in the room of the collecting case.

[0011] Preferably, the filter has a frame positioned in the collecting case, a plurality of spaced apart leading bars disposed in the frame, and a filtering path formed between any two of the leading bars. Each leading bar is formed into a polygonal shape whereby each filtering path varies in width.

[0012] Preferably, a filtering net is disposed on the exhaust opening.

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0013]

Fig. 1 is a schematic view showing a conventional filtering device;

Fig. 2 is a schematic view showing a first preferred embodiment of this invention;

Fig. 3 is a top plan view as seen along the line A-A of Fig. 2;

Fig. 4 is an enlarged view showing a partial element of Fig. 2;

Fig. 5 is a cross-sectional view showing a partial element of Fig. 2;

Fig. 6 is a schematic view showing a second preferred embodiment of this invention; and

Fig. 7 is a simulation that the gate slides along the track.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Referring to Fig. 2, a first preferred embodiment of a filtering assembly 3 of this invention is positioned within a cooking apparatus 4, such as a teppanyaki apparatus, a grilling apparatus or a frying apparatus. The cooking apparatus 4 includes a base 41, a cooking area 42 fitted on the base 41, an intake cover 43 fitted on the base 41 and having an opening 431 open to face the cooking area 42, an exhaust fan 44 connected to the base 41, and a filtering assembly 3 fitted within the base 41 and communicating with the intake cover 43 and the exhaust fan 44, an intake channel 45 formed in the filtering assembly 3 and situated between the opening 431 of the intake cover 43 and the filtering assembly 3, and an exhaust channel 46 formed between the filtering assembly 3 and the exhaust fan 44. When the exhaust fan 44 is activated to carry out the motion of air and create

the flow wind pressure with strong suction effect, fumes flowing around the cooking area 42 are drawn by the flow wind pressure and absorbed from the opening 431 of the intake cover 43, filtered by the filtering assembly 3 and discharged through the exhaust fan 44 to the outside.

[0015] The filtering assembly 3 includes a collecting case 31 connected to the intake cover 43 and having a room 31A with a large space and a filter 32 extensively fitted in the room 31A of the collecting case 31 and dividing the room 31A into a discharge area 311 communicating with the exhaust channel 46 and a filtering area 312 communicating with the intake channel 45, as shown in Fig. 5.

[0016] The collecting case 31 includes at least one collecting trough 313 formed on a bottom of the collecting case 31 and placed relative to the filter 32, an intake opening 314 communicating with the intake channel 45 and the filtering area 312, and an exhaust opening 315 communicating with the exhaust channel 46 and the discharge area 311. In this preferred embodiment, the filter 32 has a frame 321 situated in the collecting case 31 and surrounding a periphery of the filter 32 and a plurality of leading bars 322 spaced apart from each other and disposed in the frame 321. Each leading bar 322 is formed into a polygonal shape whereby each filtering path 323 varies in width, as shown in Fig. 3. Referring to Fig. 4, when the fumes are drawn to pass through the filter 32, dust and smelly odor are intercepted and absorbed by the filtering paths 323. Meanwhile, dirt and oil are blocked and adhere to surfaces of the leading bars 322 and the filtering paths 323. The blocked dirt and oil further flow downwards along the leading bars 322 and the filtering paths 323 to enter into the collecting trough 313. Further, in this preferred embodiment, the filter 32 is slantingly and movably fitted in the room 31A of the collecting case 31 to increase the cleaning convenience.

[0017] Referring to Figs. 2 to 5, when the cooking apparatus 4 is activated for cooking ingredients, the cooking area 42 is heated and the exhaust fan 44 is functioning to carry out the motion of air and create the flow wind pressure with the strong suction effect simultaneously. When the ingredients are placed on the cooking area 42, the fumes occur immediately owing to the high temperature of the cooking area 42. The fumes flowing around the cooking area 42 are then pulled by the flow wind pressure to enter into the filtering assembly 3 through the intake cover 43. Precisely, the fumes are absorbed into the filtering area 312 through the intake channel 45 from the opening 431 of the intake cover 43. Since the room 31A is formed with a large space, the filter 32 is allowed to be disposed in the room 31A extensively. When the fumes are strained by the filter 32, the dirt and oil in the fumes are blocked on the surfaces of the leading bars 322 and the filtering paths 323. Meanwhile, the blocked dirt and oil flow downwards along the leading bars 322 and the filtering paths 323 and enter into the collecting trough 313. On the other hand, the dust and smelly odor are absorbed by the filtering paths 323.

Hence, the fumes are filtered by the filter **32** without any difficulties and the resistance caused when the fumes are dragged by the suction effect of the exhaust fan **44** is reduced. After that, the filtered fumes further flow into the discharge area **311**. Because the discharge area **311** can temporarily store the filtered fumes and gradually release the filtered fumes to the exhaust channel **46**, thereby preventing the exhaust channel **46** from being squeezed when a great quantity of the filtered fumes is released simultaneously and preventing the suction effect of the exhaust fan **44** from reducing caused by the air extrusion. Further, an amount of the dirt and oil in the filtered fumes released into the discharge area **311** is greatly reduced. Therefore, the filtered fumes will not decrease the suction effect of the exhaust fan **44**. Finally, the filtered fumes are then discharged from the exhaust opening **315** to the outside through the exhaust channel **46**. Thus, the filtering efficiency is increased. Besides, the cleaning convenience is increased because the dirt and oil are gathered in the collecting trough **313** effectively to preventing a surface of the collecting case **31** from being overly stained by the dirt and oil. Moreover, the filter **32** can be dismantled and separated from the collecting case **31** to attain the simple and fast cleaning operation.

**[0018]** Referring to Fig. 6 and Fig 7 show a second preferred embodiment of the cooking apparatus **4** with filtering assembly **3** of this invention. The correlated elements and the concatenation of elements, the operation and objectives of the second preferred embodiment are the same as those of the first preferred embodiment. This embodiment is characterized in that a filtering net **33** and a controlling set **34** are fitted on the exhaust opening **315** respectively. The controlling set has a track **341** spaced from the filter **32** and a gate **342** slidably mounted on the track **341** to control an opening state of the exhaust opening **315**. Hence, the filtering net **33** assists in filtering the fumes which have been filtered by the filter **32** once again to attain the double filtering effect and to strain the fumes effectively. Meanwhile, the suction strength of the exhaust fan **44** (not shown) can be adjusted through sliding the gate **342** along the track **341** to allow the displayed area of the exhaust opening **315** to be larger or smaller.

**[0019]** Therefore, the controlling set **34** can timely adjust the opening state of exhaust opening **315** by sliding the gate **342** along the track **341** according to the suction strength and flow wind pressure of the exhaust fan **44** to increase or reduce the displayed area of the exhaust opening **315**. In other words, when the suction strength and flow wind pressure of the exhaust fan **44** are small, the gate **342** is disposed without covering the exhaust opening **315**. Thus, the exhaust fan **44** still executes the suction operation smoothly with the small suction strength and flow wind pressure. Contrarily, when the suction strength and flow wind pressure of the exhaust fan **44** are large and the user intends to centralize the suction strength of the exhaust fan **44**, the gate **342** is adjusted to cover parts of the exhaust opening **315**,

namely to narrow the displayed area of the exhaust opening **315**. Thus, the suction strength of the exhaust fan **44** is centralized effectively to attain the smooth and quick filtering operation. Further, the double filtering effect of the filtering net **33** and the filter **32** reduces an amount of the dirt and smelly order in the filtered fumes greatly. Therefore, the filtering efficiency is increased effectively.

**[0020]** To sum up, the cooking apparatus with filtering assembly of this invention takes an advantage of the room formed with a large space to allow the extensively-disposed filter to increase the area available of filtering the fumes, thereby filtering the fumes smoothly, reducing the wind resistance, and ensuring the preferable suction effect of the exhaust fan. Thus, the fumes enter into the filter without any difficulties and the resistance caused by adhered fumes or absorbing the fumes are decreased greatly. Further, the discharge area maintains the filtered fumes temporarily and releases the filtered fumes gradually, thereby preventing the exhaust channel from being squeezed when a great quantity of the filtered fumes is released simultaneously. Hence, the filtering efficiency is increased.

**[0021]** While the embodiments of this invention are shown and described, it is understood that further variations and modifications may be made without departing from the scope of this invention.

## Claims

1. A cooking apparatus (4) with filtering assembly (3) comprising a base (41), a cooking area (42) disposed on said base (41), an intake cover (43) disposed on said base (41) and provided with an opening (431) open to face said cooking area (42), an exhaust fan (44) connected to said base (41), a filtering assembly (3) disposed within said base (41) and communicating with said intake cover (43) and said exhaust fan (44), an intake channel (45) formed between said opening (431) of said intake cover (43) and said filtering assembly (3), and an exhaust channel (46) formed between said filtering assembly (3) and said exhaust fan (44);

**characterized in that** said intake channel (45) is formed in said filtering assembly (3), said filtering assembly (3) including a collecting case (31) connected to said intake cover (43) and forming a room (31A) in communication with said intake channel (45) and a filter (32) extensively disposed in said room (31A) of said collecting case (31) and dividing said room (31A) into a discharge area (311) in communication with said exhaust channel (46) and a filtering area (312) in communication with said intake channel (45), said collecting case (31) including at least one collecting trough (313) formed on a bottom thereof and located relative to said filter

(32), an intake opening (314) communicating with said intake channel (45) and said filtering area (312), and an exhaust opening (315) communicating with said exhaust channel (46) and said discharge area (311).

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2. The cooking apparatus (4) with filtering assembly (3) as claimed in claim 1, wherein a controlling set (34) is disposed on said exhaust opening (315), said controlling set (34) having a track (341) spaced from said filter (32) and a gate (342) slidably mounted on said track (341) to control an opening state of said exhaust opening (315). 10
3. The cooking apparatus (4) with filtering assembly (3) as claimed in claim 1, wherein said filter (32) is slantingly disposed in said room (31A) of said collecting case (31). 15
4. The cooking apparatus (4) with filtering assembly (3) as claimed in claim 1, wherein said filter (32) has a frame (321) positioned in said collecting case (31), a plurality of spaced apart leading bars (322) disposed in said frame (321), and a filtering path (323) formed between any two of said plurality of leading bars (322), each of said plurality of leading bars (322) being formed into a polygonal shape whereby each of said plurality of filtering paths (323) varies in width. 20 25
5. The cooking apparatus (4) with filtering assembly (3) as claimed in claim 1, wherein a filtering net (33) is disposed on said exhaust opening (315). 30

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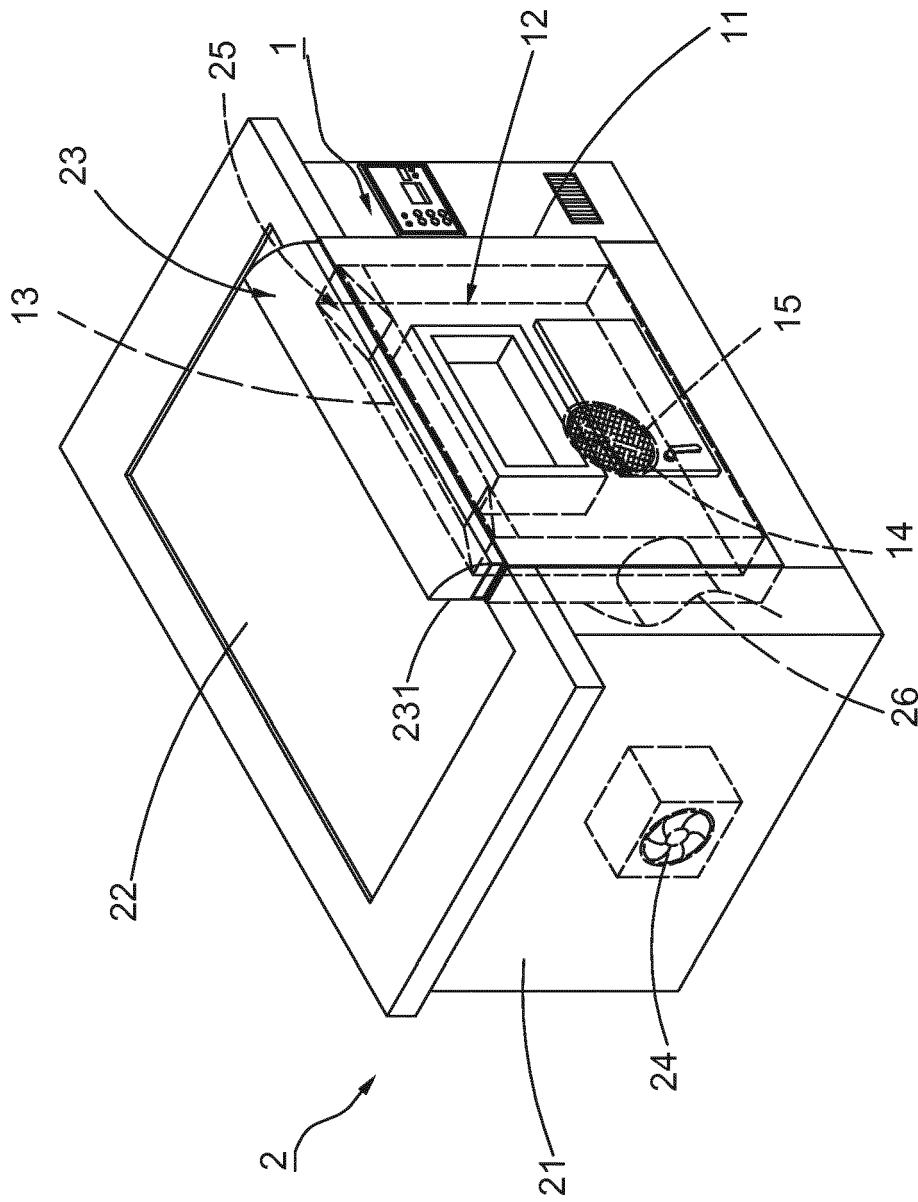


FIG. 1 (Prior Art)

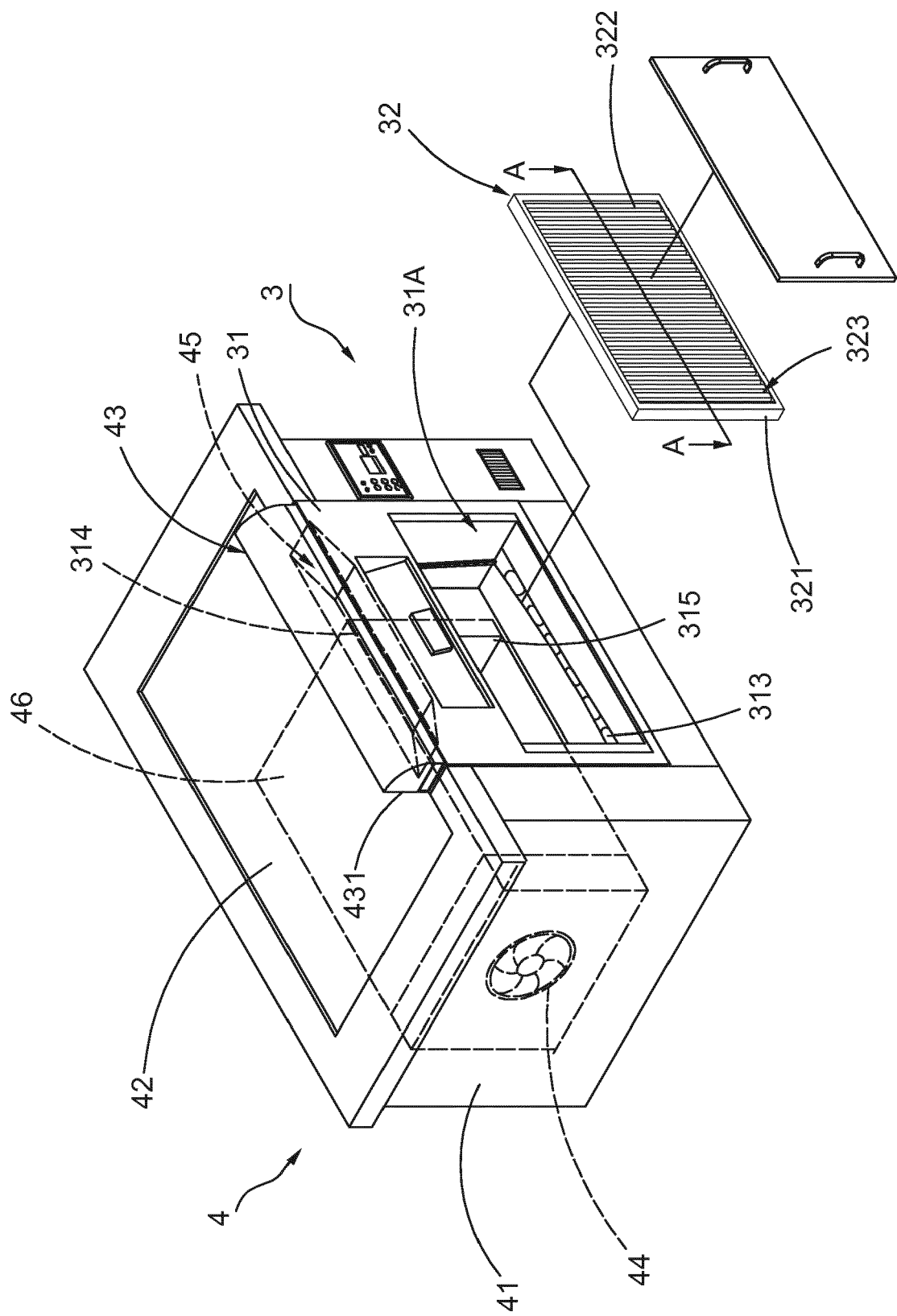


FIG. 2

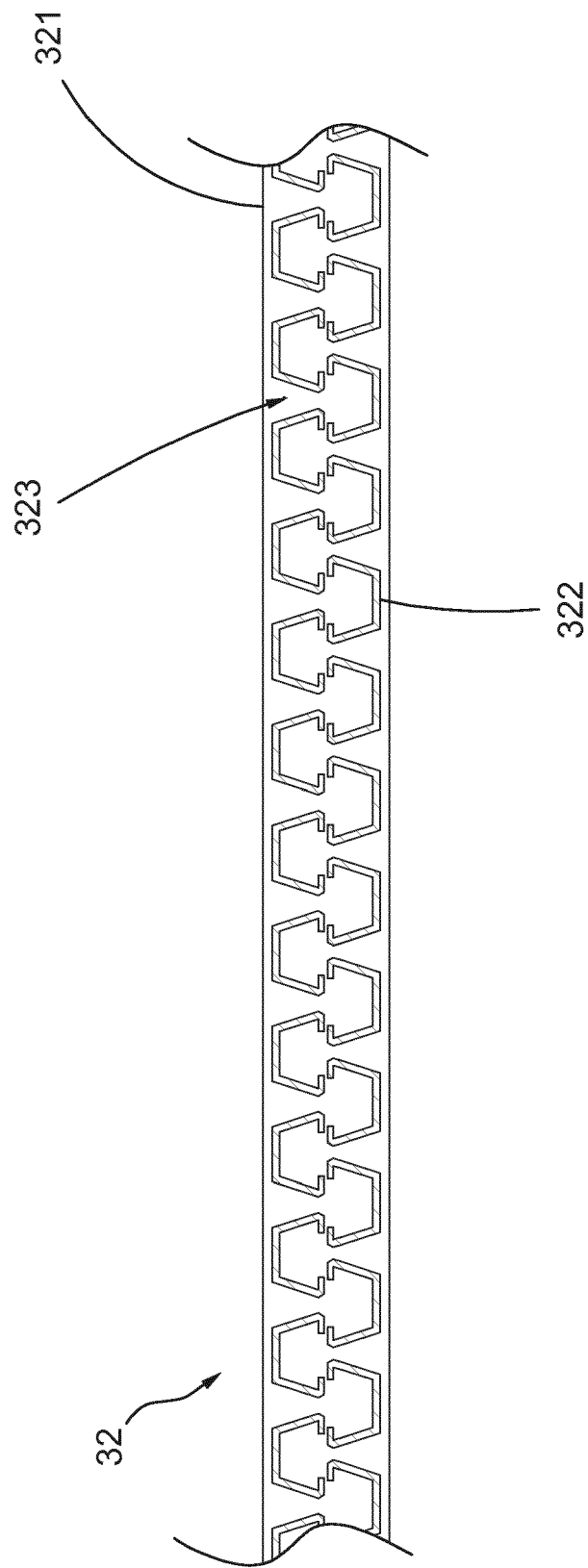


FIG. 3

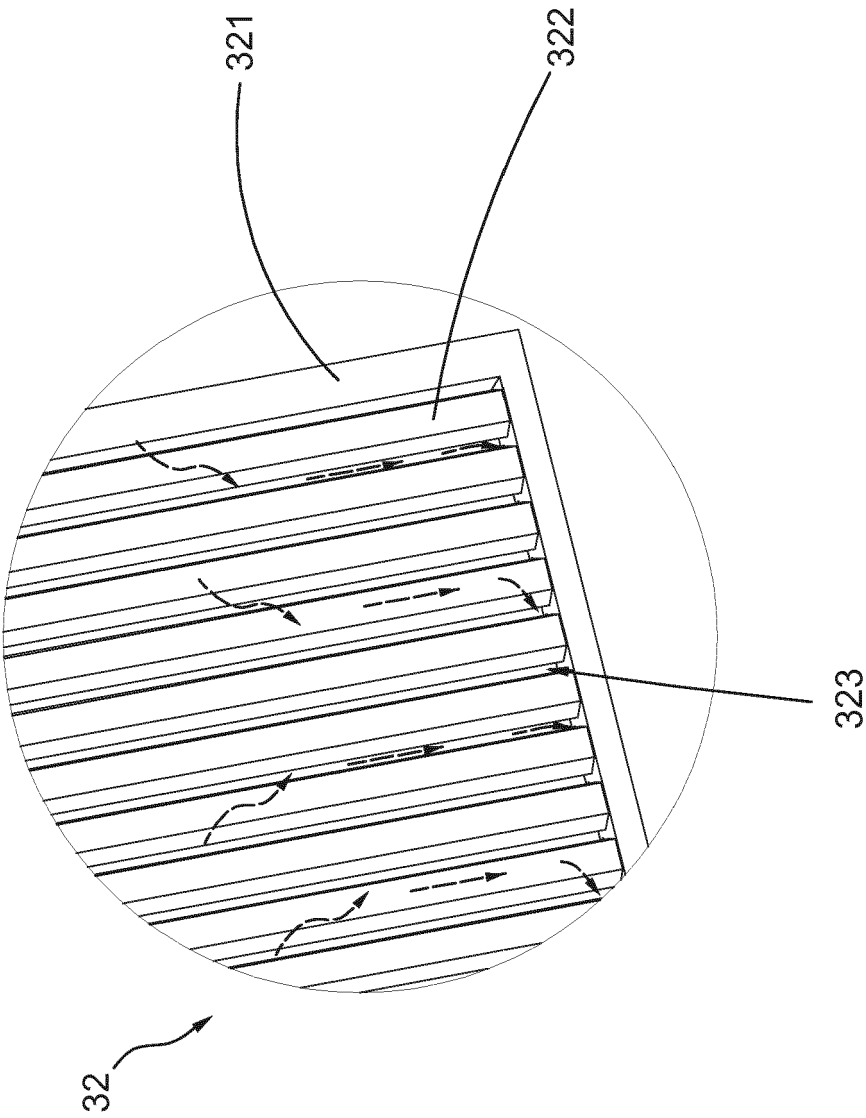


FIG. 4

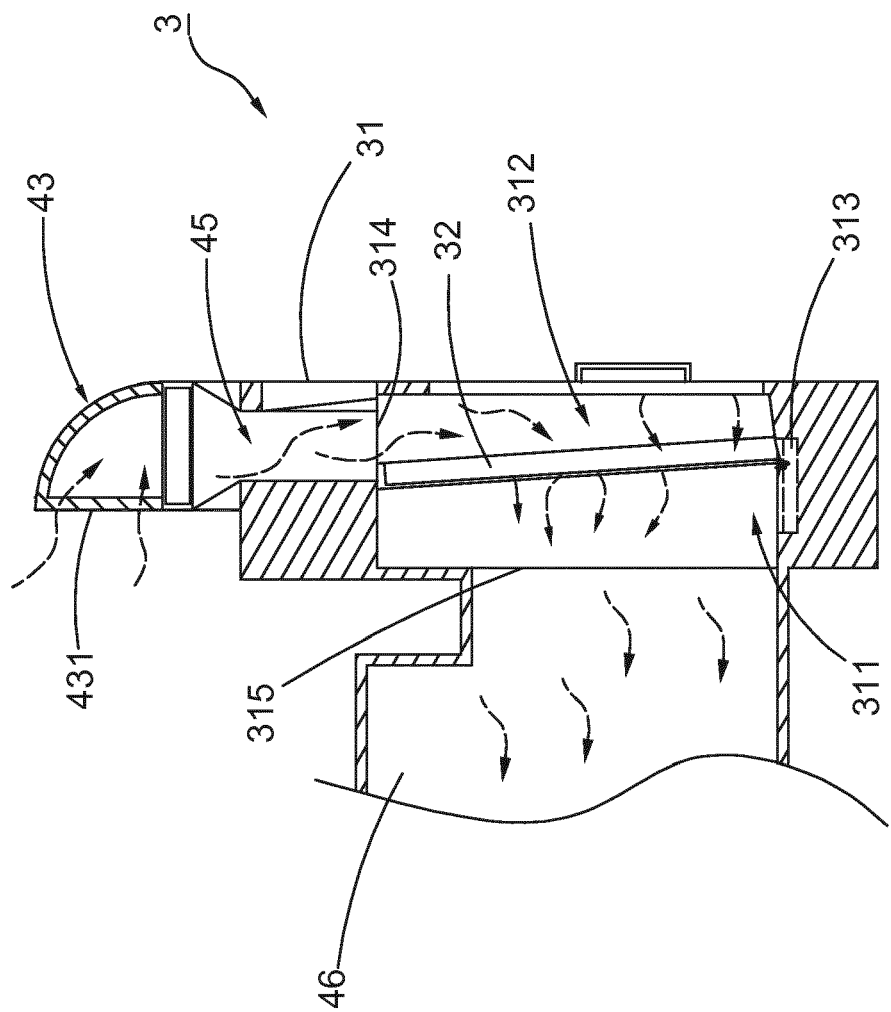


FIG. 5

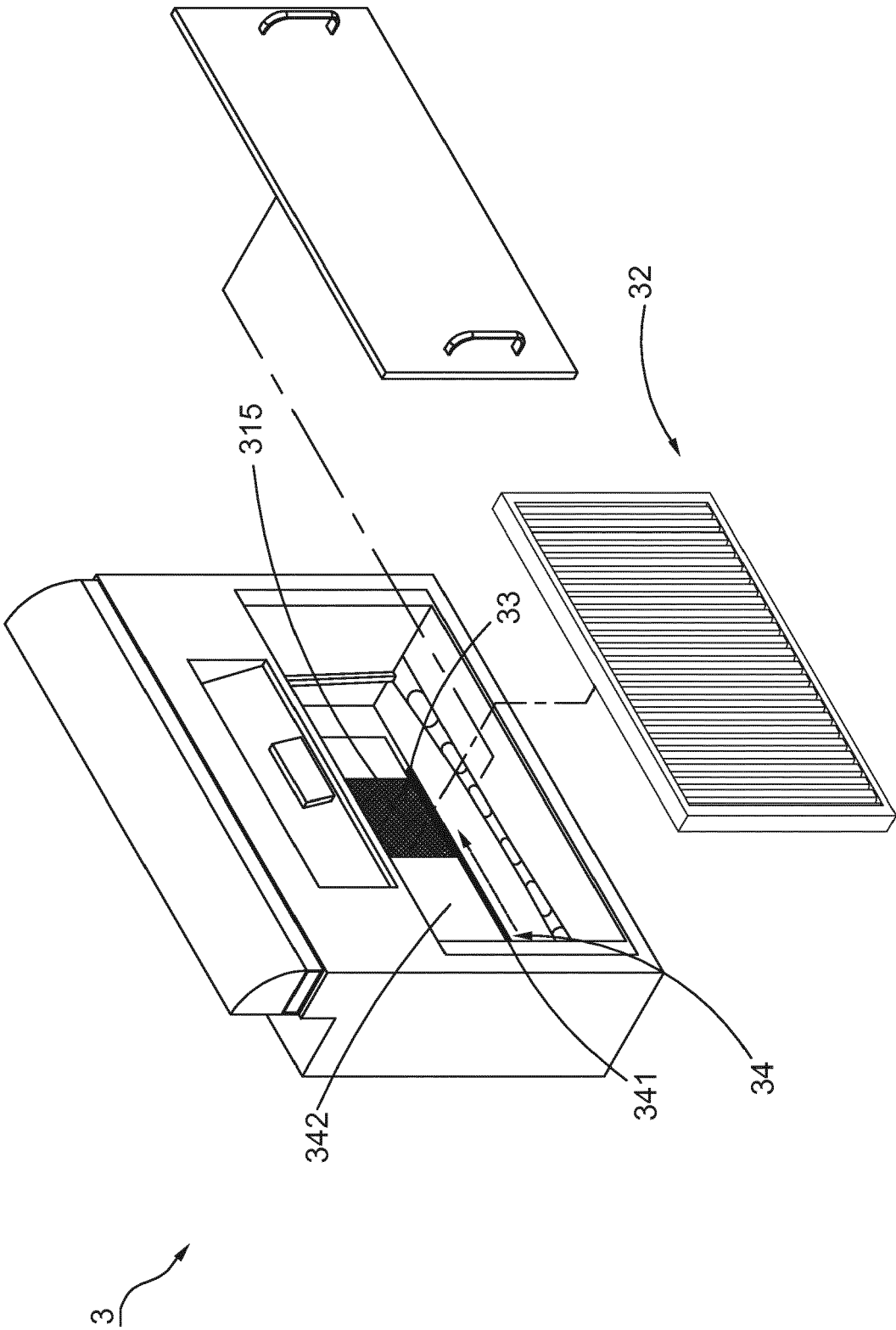


FIG. 6

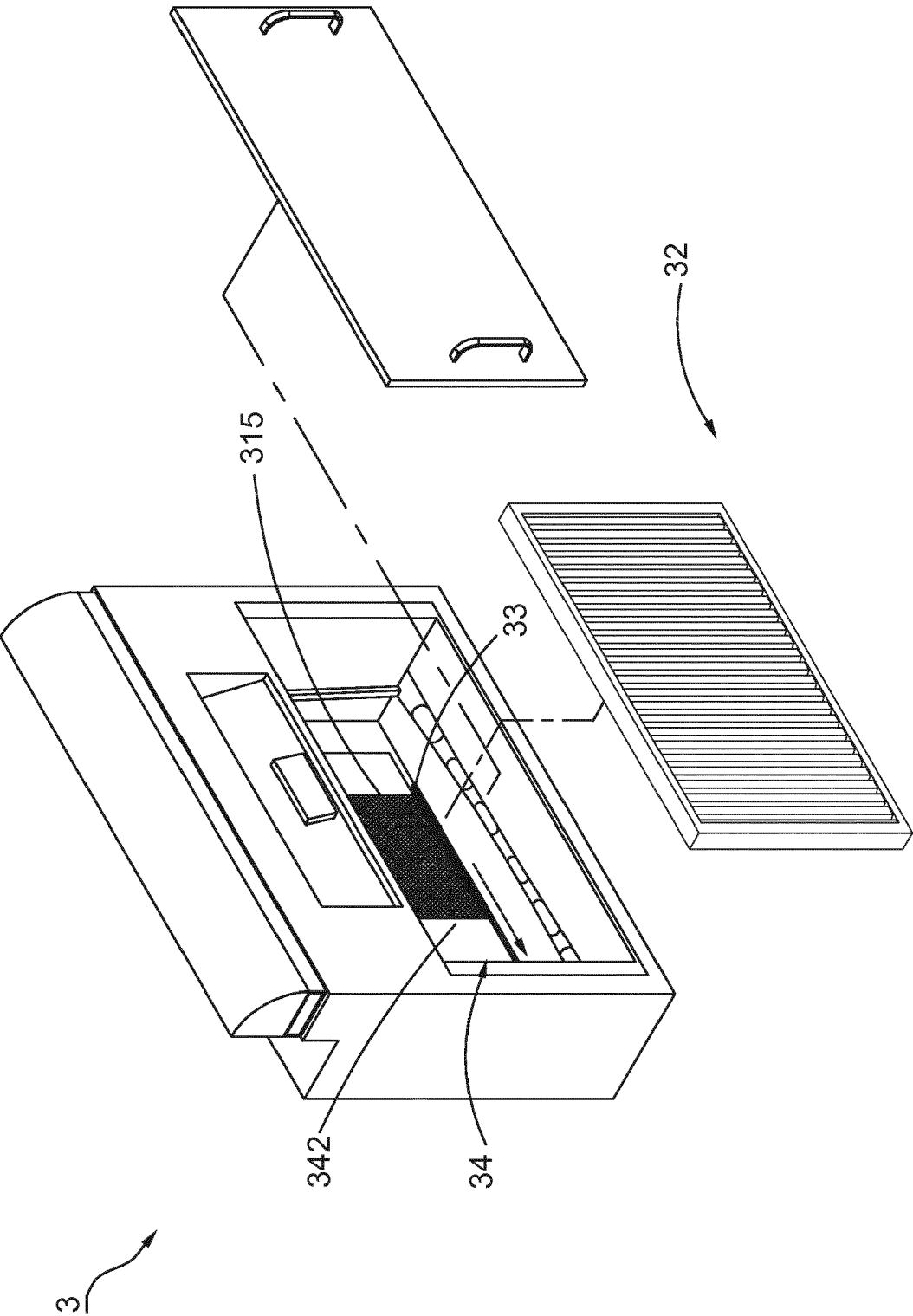


FIG. 7



## EUROPEAN SEARCH REPORT

Application Number  
EP 17 19 7051

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                      |                                                          |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                                        | Relevant to claim                                        | CLASSIFICATION OF THE APPLICATION (IPC)        |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                      |                                                          |                                                |
| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                      | Date of completion of the search<br><b>17 April 2018</b> | Examiner<br><b>Jalal, Rashwan</b>              |
| 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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