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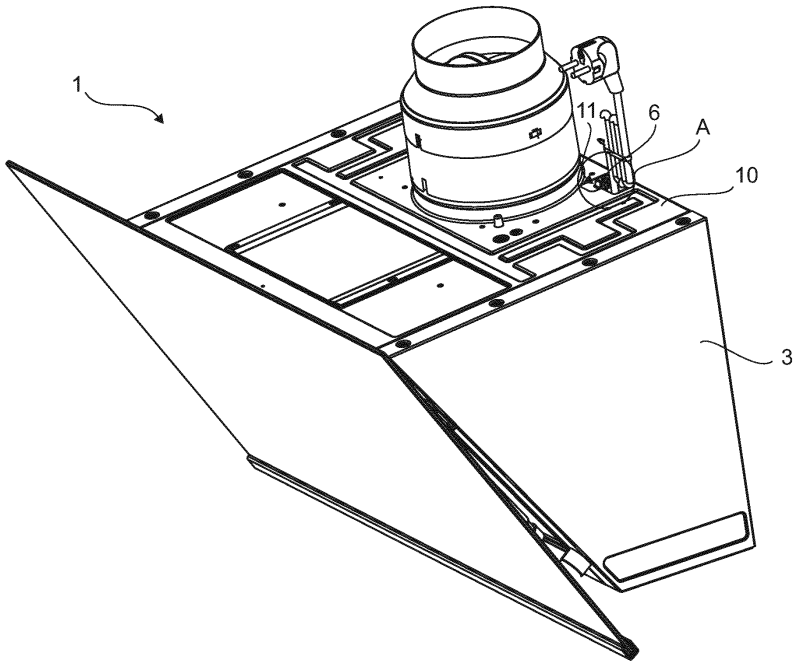
(71) Applicant: **Arçelik Anonim Sirketi**
34445 Istanbul (TR)

(72) Inventors:
- **ALTUNTAS, Hakan**
34445 Istanbul (TR)
- **DONERKAYALI, Arda**
34445 Istanbul (TR)

(54) AN EXHAUST HOOD WITH IMPROVED AUTOMATIC OPERATION PERFORMANCE

(57) The exhaust hood (1) of the present invention is positioned above cooking devices (8) such as cookers, countertop cookers and ovens so as to provide the removal of odor, smoke and moisture which occur during the cooking process, and comprises a body (2); a suction channel (3) which is provided in the body (2); at least one fan (4) which is provided in the suction channel (3); a casing (9) which protects the suction channel (3) and the fan (4) from external factors; at least one first temperature sensor (5) which is provided on the exhaust hood (1) and which detects the ambient temperature; at least two second temperature sensors (6) which detect the temperature of the air rising from the cooking device (8) or the cooking vessel thereon and which are disposed on the flow path of the air sucked into the suction channel (3); and a control unit (7) which enables the exhaust hood (1) to automatically operate according to the information received from the first and second temperature sensors (5 and 6) and which also enables the operation level to be automatically adjusted, and the first temperature sensor (5) is disposed on the spacer (10) between the suction channel (3) and the casing (9).

Figure 2



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Description

[0001] The present invention relates to an exhaust hood wherein the sensors are efficiently positioned to increase the automatic operation performance.

[0002] The exhaust hood provides the discharge of the water vapor and odor generated during the cooking process to the outside environment. With the development of sensor technologies, there are also important additional functions such as automatic operation and air purification.

[0003] The exhaust hood generally comprises a suction motor, a suction channel and a suction surface. The exhaust hood can be operated at different levels depending on the motor power in order to provide the discharge of the water vapor and odor generated during the cooking process to the outside environment. Said different levels can be selected by the user at appropriate stages according to the load of the cooking process.

[0004] In the state of the art, the user operates the exhaust hood when required during the cooking process and selects the appropriate level. In addition, there are applications where the exhaust hood is operated automatically to increase user comfort and to determine the most accurate level. In applications where the exhaust hood is operated and controlled automatically, sensors which monitor changes such as odor and temperature are used.

[0005] One of at least two temperature sensors on the exhaust hood measures the ambient temperature while the other temperature sensor detects whether the cooking device is operational or not from the temperature changes caused by the cooking process. By using at least two temperature sensors, it can be determined whether the cooker under the exhaust hood is operational or not, from the relative change (differences) between the temperature information measured by said sensors. Accordingly, it is provided that the exhaust hood is activated, the level is increased, and when the thermal load disappears, the level is reduced and the exhaust hood is closed. However, the position of the sensor, which follows the ambient temperature, that is, the reference temperature, should be in a position which is suitable for measuring the ambient temperature, away from the hot air path caused by the cooking device load, at a point that is not affected by the heat caused by the cooking process.

[0006] For the measurement of the ambient temperature, it is of great importance to determine a position for the placement of the sensor detecting the ambient temperature, which is not directly affected by the factors that may mislead the temperature measurement, such as heater, air conditioner, ventilation, window or sunlight in the environment, apart from the cooking device and the heat originating from the cooking process. As the sensor measuring the ambient temperature is affected by the cooking device and the cooking process or external heat sources, no relative difference occurs between the sensor measuring the load temperature of the cooking device and the sensor measuring the ambient temperature, and the exhaust hood cannot perform its automatic operation function.

[0007] Similarly, when a heater or air conditioner is operated or sunlight is present to emit heat directly onto the sensor which measures the ambient temperature, automatic operation cannot be achieved, automatic level adjustment cannot be performed, or automatic shutdown cannot be performed at the end of the operation, since the reference point is affected. Moreover, as a result of sudden decreases and errors in the reference temperature measurement due to the air conditioner or the wind blowing from the window directly affecting the sensor which measures the ambient temperature, even though there is no cooking process, it is inevitable that the exhaust hood causes faulty automatic operation, incorrect level adjustment or incorrect termination.

[0008] In the state of the art German Patent Application No. DE102006041581, an exhaust hood which is prevented from overheating and a control method are disclosed.

[0009] In the state of the art Chinese Utility Model Document Application No. CN2491733, a smart exhaust hood comprising a control device is disclosed. In this document, two negative temperature coefficient thermistors are used as sensors. The thermistors are mounted directly onto the lower corners of the exhaust hood.

[0010] In the state of the art German Patent Application No. DE3922090, an exhaust hood is disclosed, comprising a temperature sensor placed on the outer surface thereof and measuring the ambient temperature and at least two temperature sensors placed on the suction surface, wherein the fan is controlled according to temperature difference based on the information received from the sensors.

[0011] In the state of the art International Patent Application No. WO2020078670, an exhaust hood is disclosed, which is positioned above cooking devices such as cooker, oven, etc., comprising a body; a suction pipe; a fan which enables the air to be sucked and discharged to the outer environment; a guiding plate which is disposed on the lower surface of the body; an air suction duct; and one or more than one temperature sensor which measures the temperature of the air rising from the cooking device by heating up. This document also discloses the temperature sensor which is mounted at the center of the air suction duct between the guiding plate and the front panel, which is positioned in the flow path of the air, and which is enabled to be affected from the air flow at maximum. Thus, incorrect measurement is prevented while the temperature sensor performs its automatic operating functions.

[0012] The aim of the present invention is the realization of an exhaust hood wherein the sensors are efficiently positioned to increase the automatic operation performance.

[0013] The exhaust hood realized in order to attain the

aim of the present invention, explicated in the first claim and the respective claims, comprises at least one first temperature sensor which detects the ambient temperature; at least two second temperature sensors which detect the temperature of the air rising from a cooking device such as countertop cooker, oven, etc. or a cooking vessel thereon and which are disposed on the flow path of the air sucked; and a control unit which enables the exhaust hood to automatically operate according to the information received from the first and second temperature sensors and which also enables the operation level to be automatically adjusted; and the first temperature sensor is disposed on the spacer between the suction channel and the casing. Thus, in order for the automatic operation function of the exhaust hood to work correctly and effectively, the first temperature sensor, which measures the ambient temperature, is placed in a more protected area to prevent the same from being suddenly affected by various physical elements in the external environment and to enable the same to measure the ambient temperature more effectively.

[0014] By placing the first temperature sensor at a point on the spacer at the base of the casing, which is located on the suction channel in the exhaust hood and which also decoratively covers the suction channel outlet, the room temperature can be more accurately monitored by measuring the temperature of a homogeneous region, which is affected by the environmental effects at the minimum level, by the first temperature sensor.

[0015] By means of the present invention, one and/or more than one temperature sensor is positioned on the spacer between the suction channel and the casing of the exhaust hood and the temperature of the homogeneous region between the casing and the suction channel is measured, thus by correctly detecting the relative difference between the second temperature sensor, which measures the cooking device load temperature, and the first temperature sensor, the automatic start, automatic level adjustment and automatic termination operations are provided.

[0016] In an embodiment of the present invention, the exhaust hood comprises a housing which is formed on the spacer and the first temperature sensor which is disposed into the housing. The housing comprises a ceiling formed by shaping the spacer upwards, and an opening which is formed on the side of the housing facing the side wall of the casing and which allows the first temperature sensor to be placed and removed easily and quickly.

[0017] In another embodiment of the present invention, the exhaust hood comprises a first stage which is parallel to the base in the housing in which the first temperature is placed, and where the head of the first temperature sensor sits between the base and the first stage and a second stage which is parallel to the first stage and on which the body of the first temperature sensor sits. By acting as a guide, the first and second stages enable the first temperature sensor to be easily placed into and removed from the housing and also enable the first temperature sensor to be positioned more securely in the housing so as to be prevented from moving.

[0018] In an embodiment of the present invention, the first and second stages are in the form of "U", which are formed such that the open parts thereof coincide with the opening.

[0019] In another embodiment of the present invention, the second stage comprises a step on which the body of the first temperature sensor sits. In this embodiment, the body of the first temperature sensor sits on the step from the bottom and the first temperature sensor is supported from the bottom of the body.

[0020] By placing the first temperature sensor, which is used for monitoring the ambient temperature, in the area between the casing and the suction channel, the heat generated by cooking, sunlight, a heater, air conditioner or ventilation operated in the room or air coming from the window is prevented from reaching the first temperature sensor directly. Thus, by measuring the temperature of a more homogeneous and stable environment, a more accurate ambient temperature can be determined and the temperature change in the environment can be monitored. Consequently, the relative difference between the ambient temperature and the cooking device temperature is correctly detected, and the cooking processes done in different cooking device zones, different cooking device types, different cooking device power levels, different cooking vessels and different exhaust hood modes, are correctly detected while the fan motor is enabled to be automatically adjusted and terminated.

[0021] An exhaust hood realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the sideways view of an exhaust hood and a cooking device.

Figure 2 - is the perspective view of the exhaust hood.

Figure 3 - is the view of detail A in Figure 2.

Figure 4 - is the sideways cross-sectional view of the exhaust hood.

Figure 5 - is the view of detail B in Figure 4.

[0022] The elements illustrated in the figures are numbered as follows:

1. Exhaust hood
2. Body
3. Suction channel
4. Fan
5. First temperature sensor

6. Second temperature sensor

7. Control unit

8. Cooking device

9. Casing

10. Spacer

11. Housing

12. Ceiling

13. Opening

14. First stage

15. Second stage

16. Step

[0023] The exhaust hood (1) of the present invention is positioned above cooking devices (8) such as cookers, countertop cookers and ovens so as to provide the removal of odor, smoke and moisture which occur during the cooking process, and comprises a body (2); a suction channel (3) which is provided in the body (2); at least one fan (4) which is provided in the suction channel (3); a casing (9) which protects the suction channel (3) and the fan (4) from external factors; at least one first temperature sensor (5) which is provided on the exhaust hood (1) and which detects the ambient temperature; at least two second temperature sensors (6) which detect the temperature of the air rising from the cooking device (8) or the cooking vessel thereon and which are disposed on the flow path of the air sucked into the suction channel (3); and a control unit (7) which enables the exhaust hood (1) to automatically operate according to the information received from the first and second temperature sensors (5 and 6) and which also enables the operation level to be automatically adjusted, and the first temperature sensor (5) is disposed on the spacer (10) between the suction channel (3) and the casing (9). Thus, in order for the automatic operation function of the exhaust hood (1) to work correctly and effectively, the first temperature sensor (5), which measures the ambient temperature, is placed in a more protected area to prevent the same from being suddenly affected by various physical elements in the external environment and to enable the same to measure the ambient temperature more effectively (Figure 1).

[0024] By placing the first temperature sensor (5) at a point on the spacer (10) which is positioned on the ceiling of the suction channel (3) and at the base of the casing (9), which is located on the suction channel (3) in the exhaust hood (1) and which also decoratively covers the suction channel (3) outlet, the room temperature can be more accurately monitored by measuring the temperature of a homogeneous region, which is affected by the environmental effects at the minimum level, by the first temperature sensor (5). Moreover, since the first temperature sensor (5), which measures the ambient temperature, is located inside the exhaust hood (1), between the casing (9) and the suction channel (3), the contamination of the first temperature sensor (5) is prevented and it is also provided that the first temperature sensor (5) cannot be seen from the outside and cannot be contacted from the outside, which is important in terms of safety, visual quality and hygiene perception.

[0025] By means of the present invention, one and/or more than one first temperature sensor (5) is positioned on the spacer (10) between the suction channel (3) and the casing (9) of the exhaust hood (1) and the temperature of the homogeneous region between the casing (9) and the suction channel (3) is measured, thus by correctly detecting the relative difference between the second temperature sensor (6), which measures the cooking device (8) load temperature, and the first temperature sensor (5), the automatic start, automatic level adjustment and automatic termination operations are provided.

[0026] In an embodiment of the present invention, the exhaust hood (1) comprises a housing (11) which is formed on the spacer (10) and the first temperature sensor (5) which is disposed into the housing (11). The housing (11) comprises a ceiling (12) formed by shaping the spacer (10) upwards, and an opening (13) which is formed on the side of the housing (11) facing the side wall of the casing (9) and which allows the first temperature sensor (5) to be placed and removed easily and quickly (Figure 2 and Figure 3).

[0027] In another embodiment of the present invention, the exhaust hood (1) comprises a first stage (14) which is parallel to the ceiling (12) in the housing (11) in which the first temperature (5) is placed, and where the head of the first temperature sensor (5) sits between the ceiling (12) and the first stage (14) and a second stage (15) which is parallel to the first stage (14) and on which the body of the first temperature sensor (5) sits. By acting as a guide, the first and second stages (14 and 15) enable the first temperature sensor (5) to be easily placed into and removed from the housing (11) and also enable the first temperature sensor (5) to be positioned more securely in the housing (11) so as to be prevented from moving.

[0028] In an embodiment of the present invention, the first and second stages (14) and (15) are in the form of "U", which are formed such that the open parts thereof coincide with the opening (13).

[0029] In another embodiment of the present invention, the exhaust hood (1) comprises a step (16) on the second stage (15), on which the body of the first temperature sensor (5) sits. In this embodiment, the body of the first temperature sensor (5) sits on the step (16) from the bottom and the first temperature sensor (5) is supported from the bottom of the body (Figure 4 and Figure 5).

[0030] By placing the first temperature sensor (5), which is used for monitoring the ambient temperature, in the area between the casing (9) and the suction channel (3), the heat generated by cooking, sunlight, a heater, air conditioner or ventilation operated in the room or air coming from the window is prevented from reaching the first temperature sensor (5) directly. Thus, by measuring the temperature of a more homogeneous and stable environment, a more accurate ambient temperature can be determined and the temperature change in the environment can be monitored. Consequently, the relative difference between the ambient temperature and the cooking device (8) temperature is correctly detected, and the cooking processes done in different cooking device (8) zones, different cooking device (8) types, different cooking device (8) power levels, different cooking vessels and different exhaust hood (1) modes, are correctly detected while the fan (4) motor is enabled to be automatically adjusted and terminated.

Claims

1. An exhaust hood (1) which is positioned above cooking devices (8) such as cookers, countertop cookers and ovens so as to provide the removal of odor, smoke and moisture which occur during the cooking process, and **comprising** a body (2); a suction channel (3) which is provided in the body (2); at least one fan (4) which is provided in the suction channel (3); a casing (9) which protects the suction channel (3) and the fan (4) from external factors; at least one first temperature sensor (5) which is provided on the exhaust hood (1) and which detects the ambient temperature; at least two second temperature sensors (6) which detect the temperature of the air rising from the cooking device (8) or the cooking vessel thereon and which are disposed on the flow path of the air sucked into the suction channel (3); and a control unit (7) which enables the exhaust hood (1) to automatically operate according to the information received from the first and second temperature sensors (5 and 6) and which also enables the operation level to be automatically adjusted, **characterized by** the first temperature sensor (5) which is disposed on the spacer (10) between the suction channel (3) and the casing (9).

2. An exhaust hood (1) as in Claim 1, **characterized by** a housing (11) which is formed on the spacer (10) and wherein the first temperature sensor (5) is placed.

3. An exhaust hood (1) as in Claim 2, **characterized by** the housing (11) comprising a ceiling (12) formed by shaping the spacer (10) upwards, and an opening (13) which is formed on the side of the housing (11) facing the side wall of the casing (9) and which allows the first temperature sensor (5) to be placed and removed easily and quickly.

4. An exhaust hood (1) as in Claim 1, **characterized by** a first stage (14) which is parallel to the ceiling (12) in the housing (11) in which the first temperature (5) is placed, and where the head of the first temperature sensor (5) sits between the ceiling (12) and the first stage (14) and a second stage (15) which is parallel to the first stage (14) and on which the body of the first temperature sensor (5) sits.

5. An exhaust hood (1) as in Claim 4, **characterized by** the first and second stages (14) and (15) which are in the form of "U", which are formed such that the open parts thereof coincide with the opening (13).

6. An exhaust hood (1) as in Claim 4, **characterized by** a step (16) on the second stage (15), on which the body of the first temperature sensor (5) sits.

Figure 1

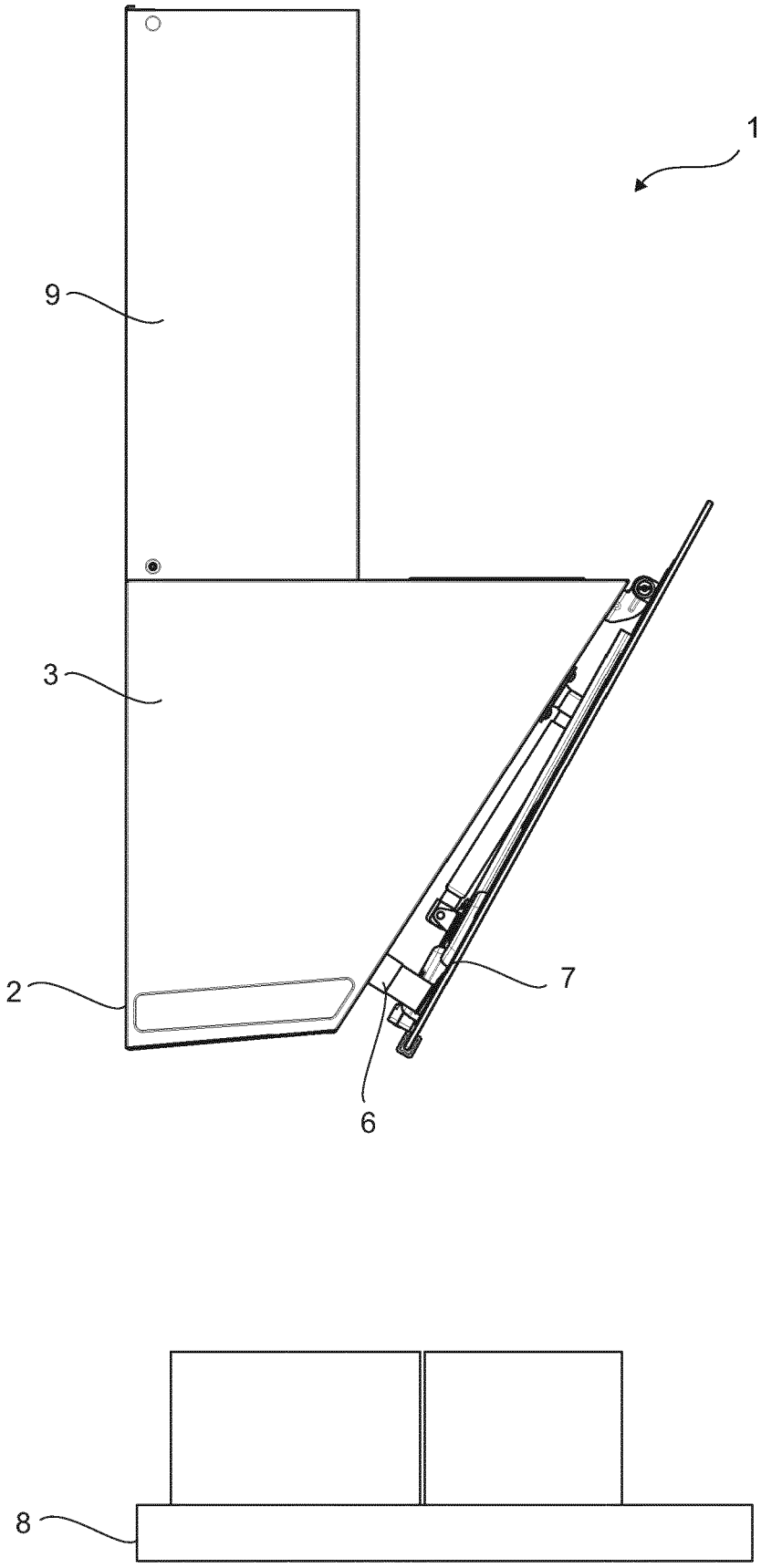


Figure 2

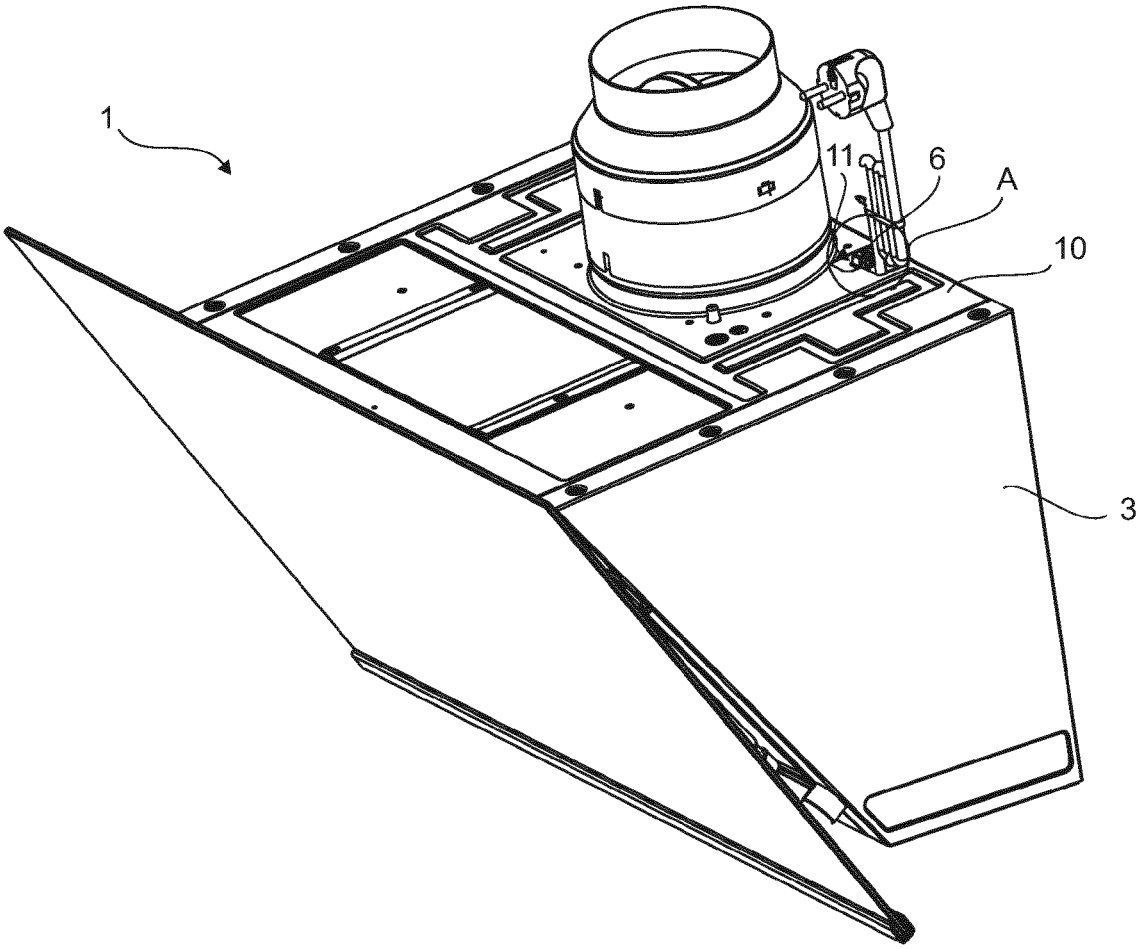


Figure 3

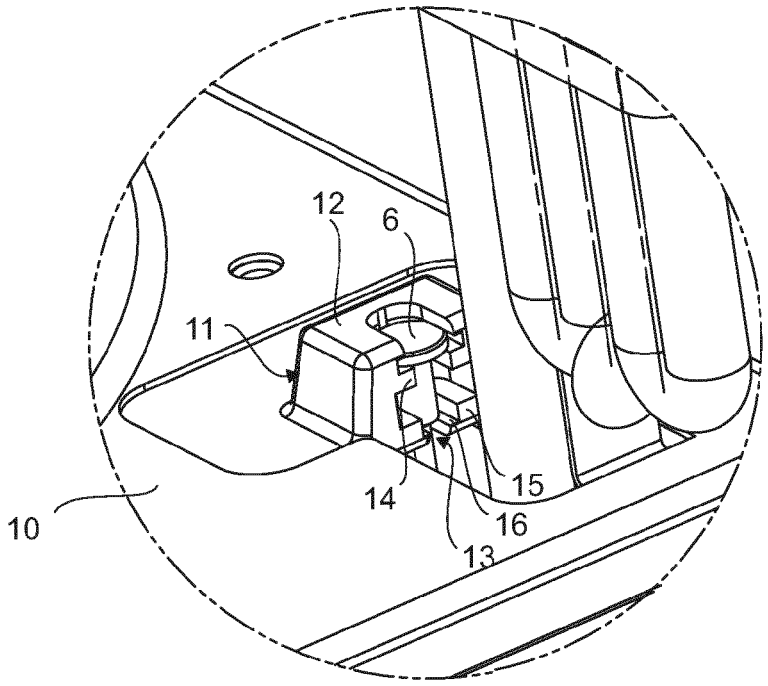


Figure 4

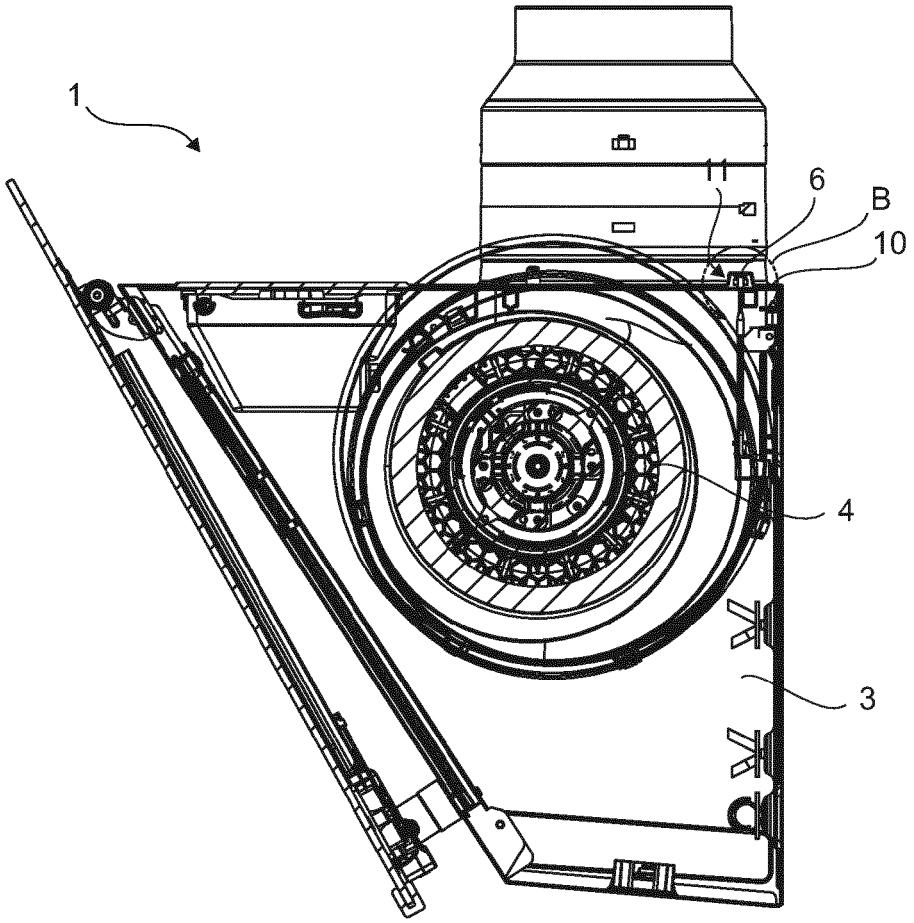
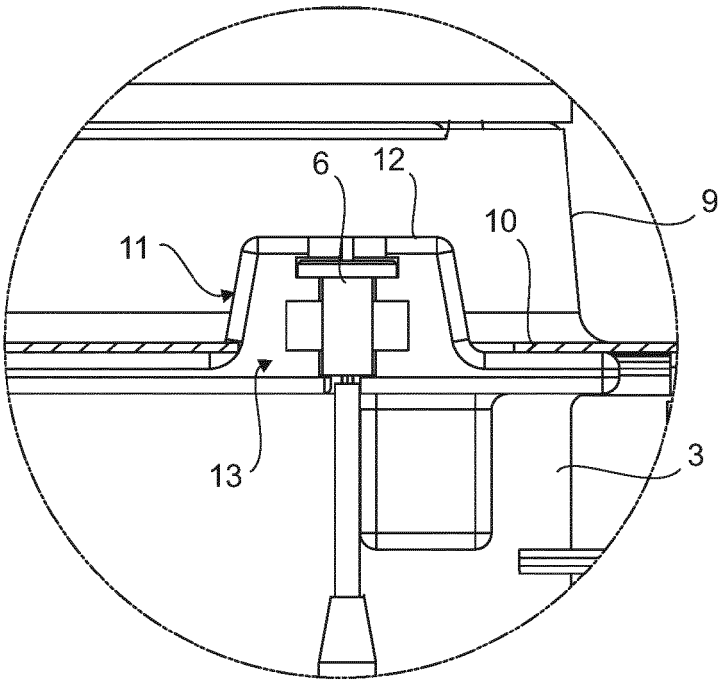


Figure 5



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EUROPEAN SEARCH REPORT

Application Number
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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	28 September 2023	Rodriguez, Alexander

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