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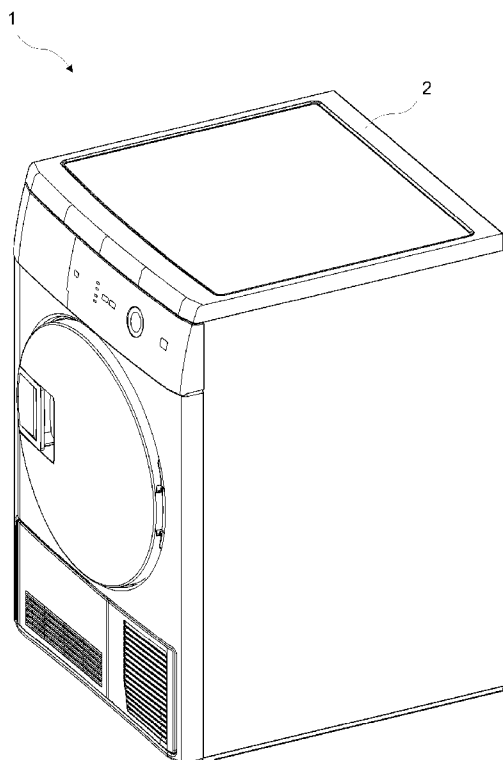
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(54) Title: A HEAT PUMP LAUNDRY DRYER

Figure 1



(57) Abstract: The present invention relates to a laundry dryer (1) comprising a body (2); a tub (3) disposed inside the body (2) and wherein the drying process is performed; an air duct (4) wherein the circulation of the process air (PA) is performed; a fan (5) that is disposed on the air duct (4) and that provides the circulation of the process air (PA) and an evaporator (6) that is disposed inside the air duct (4) and that condenses the humid process air (PA).

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Description**A HEAT PUMP LAUNDRY DRYER**

- [0001] The present invention relates to a laundry dryer that performs the drying process by means of a heat pump.
- [0002] With the developing technology, the users want whatever is desired from household appliances to be performed by pressing a single button. In laundry dryers, the users desire to obtain laundry that is dry in the desired level by a single button. In the state of the art, multiple methods are known for detecting the dryness of the laundry in the laundry dryer. Some of these are to detect dryness by the conductivity sensors inside the tub and to detect dryness by the change in the amount of humidity. In dryness detection performed by the conductivity sensor, correct results cannot be obtained all the time since it is not possible to control all the laundry inside the tub. In dryness detection performed by the humidity sensor, dryness cannot be determined precisely due to difference of the humidity amount contained in the laundry and the humidity amount in the environment.
- [0003] In the state of the art International Patent Application No. WO9732071, a laundry dryer is disclosed, that detects dryness by making use of electric conductivity of the laundry.
- [0004] In the state of the art Japanese Patent Application No. JP2013085863, a washing and drying machine is disclosed, wherein clogging of the lint filter is detected by means of pressure difference.
- [0005] The aim of the present invention is the realization of a laundry dryer wherein the dryness level of the laundry is detected accurately.
- [0006] The laundry dryer realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a first pressure sensor and a second pressure sensor that are disposed on the air duct and that enable the pressure of the process air to be measured and a control unit that calculates the pressure difference generated on the tub or the evaporator by using the values read by the first pressure sensor and the second pressure sensor and that determines whether or not the laundry is at the desired dryness level by comparing the calculated pressure difference value with the limit values stored in its

memory. By means of the first pressure sensor and the second pressure sensor, the pressure values of the process air before entering the tub and after leaving the tub or before and after the evaporator are measured. The pressure difference value in the pressure of the process air generated on the tub containing the laundry or the pressure difference value generated on the evaporator where the humidity removed from the laundry condenses can be associated with the dryness level of the laundry. The control unit detects the dryness level of the laundry by evaluating the pressure difference value.

[0007] In the laundry dryer of the present invention, the moisture on the laundry prevents flow of the process air by creating resistance. This resistance affects the pressure of the process air and creates differences in the pressure values read before and after the tub or the evaporator. As the laundry dries, the pressure difference value on the tub increases while the pressure difference value on the evaporator decreases. Thus, it is understood that the pressure difference value is correlated with different dryness rates of the laundry. The control unit detects the dryness rate of the laundry by comparing the pressure difference value with the limit values prerecorded in its memory.

[0008] In an embodiment of the present invention, the first pressure sensor is disposed before the tub with respect to the flow direction of the process air, preferably at the point where the air duct is connected to the tub and the second pressure sensor is disposed after the tub with respect to the flow direction of the process air, preferably before the lint filter. The laundry becomes fluffy with the effect of the process air as the moisture is removed therefrom. As the surface area of the fluffy laundry increases, the surface area the process air interacts with increases and the static pressure of the process air decreases. This situation causes increase in the pressure difference value and when the laundry is entirely dry, the pressure difference value reaches the highest value in the same drying cycle.

[0009] In another embodiment of the present invention, the first pressure sensor is disposed before the evaporator with respect to the flow direction of the

process air, and the second pressure sensor is disposed after the evaporator with respect to the flow direction of the process air. The moisture removed from the laundry condenses on the evaporator and increases the resistance the evaporator applies to the process air flow. The water condensed on the evaporator accumulates on the fins of the evaporator and even completely covers the area between two fins, preventing the flow of process air entirely. As the dryness process continues, the water condensed on the evaporator is removed by being evaporated or being collected in the collection tray and the resistance value applied on the process air gets close to the value prior to drying. In the flow direction of the process air, the pressure difference between the pressure value of the process air before and after the evaporator changes during the drying process and can be correlated with the rate of dryness of the laundry as on the tub.

[0010] In another embodiment of the present invention, when the pressure difference value reaches the predetermined limit values corresponding to the dryness level selected by the user at the start of the drying process, the control unit decides that the laundry is at the desired dryness level and ends the drying process. The user selects the desired dryness level by means of the buttons on the laundry dryer before the drying process starts. By means of this embodiment, when laundry at different dryness rates is desired, the control unit ends the drying process when the pressure difference value reaches the limit value corresponding to the desired dryness level.

[0011] In another embodiment of the present invention, the control unit ends the drying process when the pressure difference value reaches the limit values predetermined by the manufacturer for different types and amounts of laundry. Consumer satisfaction is increased by means of ending the drying process when the dryness level determined by the manufacturer for different types of laundry and the pressure difference value reaches the limit values. For example, laundry that shrinks when overdried is detected by the control unit and is dried until reaching the damp-dry dryness level.

[0012] In another embodiment of the present invention, the control unit ends the

drying process when the pressure difference value remains almost constant for a predetermined time duration. By means of this embodiment, the drying process is ended when the laundry is entirely devoid of moisture and the process air flow is balanced and the pressure difference is stabilized. The constant value mentioned herein is the situation wherein the pressure value fluctuates within the measurement precision limits of the pressure sensors.

- [0013] In another embodiment of the present invention, the control unit waits for a predetermined time period after the drying process starts in order to compare the pressure difference value with the limit values recorded in its memory. By means of this embodiment, the control unit is prevented from making faulty decisions due to irregularities that may form in the process air until it is balanced during the transitional stage when the fan is first started. For example, the control unit does not control the pressure difference value in the first half hour of the drying process and after this duration, starts comparing the pressure difference value with the limit values recorded in its memory.
- [0014] In another embodiment of the present invention, the control unit monitors the changes in the pressure difference value and when the pressure difference value reaches the highest value in the same drying cycle, records the said value as the maximum pressure difference value. The efficiency of the evaporator can be calculated by using the pressure difference value since the pressure difference value depends on how much condensed water is on the evaporator.
- [0015] In another embodiment of the present invention, the control unit calculates the first pressure difference value on the evaporator by means of the first pressure sensor and the second pressure sensor, records this value in its memory and ends the drying process by deciding that the laundry has dried completely when the pressure difference value reaches the first pressure difference value calculated at the start of the drying process. As the laundry dries and becomes devoid of moisture, there is no water condensation on the evaporator and as the condensed water is discharged, the evaporator returns to the initial state at the start of the

drying cycle. Therefore, when the pressure difference value reaches the first pressure difference value, the laundry becomes entirely dry and the control unit ends the drying process.

- [0016] In another embodiment of the present invention, the control unit compares the pressure difference value with the limit values recorded in its memory if the instantaneous pressure difference value is smaller than the pressure difference value previously calculated in the predetermined number of times when the pressure difference on the evaporator is measured. The pressure difference value on the evaporator increases at the start of the drying process and then starts to decrease. The pressure limit difference values corresponding to different dryness rates can be between the first pressure difference value and the maximum pressure difference value. In this situation, the pressure difference value reaches limit values corresponding to different dryness rates twice in the same cycle and by means of this embodiment, the control unit is prevented from detecting the laundry as dry when it is not yet dry.
- [0017] In another embodiment of the present invention, the laundry dryer comprises at least one sensor used for detecting dryness therein and which enables the measurement of factors like temperature, conductivity and humidity. By means of this embodiment, the dryness rate detected by using the pressure difference value is confirmed by other sensors.
- [0018] In another embodiment of the present invention, the laundry dryer is a laundry washer/dryer. The laundry washer/dryer enables the laundry to be washed and dried preferably in the same tub. The laundry washer/dryer enables the laundry to be dried at the desired dryness rate by means of the control unit that detects dryness by using the pressure difference value in the dryness process.
- [0019] In the laundry dryer of the present invention, the dryness rate of the laundry is detected by making use of the resistance effect the moisture on the laundry performs against the flow of the process air.
- [0020] The laundry dryer realized in order to attain the aim of the present invention is illustrated in the attached figures, where:
- [0021] Figure 1 – is the perspective view of a laundry dryer.

- [0022] Figure 2 – is the sideways schematic view of the laundry dryer relating to an embodiment of the present invention.
- [0023] Figure 3 – is the sideways schematic view of the laundry dryer relating to another embodiment of the present invention.
- [0024] The elements illustrated in the figures are numbered as follows:
- [0025] 1. Laundry dryer
- [0026] 2. Body
- [0027] 3. Tub
- [0028] 4. Air duct
- [0029] 5. Fan
- [0030] 6. Evaporator
- [0031] 7. First pressure sensor
- [0032] 8. Second pressure sensor
- [0033] 9. Control unit
- [0034] The following symbols are used for explicating the laundry dryer (1) of the present invention:
- [0035] ΔP : Pressure difference value between the instantaneous measurements of the first pressure sensor and the second pressure sensor
- [0036] ΔP_i : First pressure difference value calculated at the start of the drying process
- [0037] ΔP_{max} : Maximum pressure difference value between the instantaneous measurements of the first pressure sensor and the second pressure sensor in the same dryness cycle
- [0038] The laundry dryer (1) comprises a body (2); a tub (3) disposed inside the body (2) and wherein the drying process is performed; an air duct (4) wherein the circulation of the process air (PA) is performed; a fan (5) that is disposed on the air duct (4) and that provides the circulation of the process air (PA) and an evaporator (6) that is disposed inside the air duct (4) and that condenses the humid process air (PA).
- [0039] The laundry dryer (1) of the present invention comprises a first pressure sensor (7) and a second pressure sensor (8) that are disposed in the air duct (4) and that provide the measurement of the pressure of the process air (PA) and a control unit (9) that decides whether or not the laundry has

reached the desired dryness rate by calculating the pressure difference value (ΔP) between the instantaneous measurements of the first pressure sensor (7) and the second pressure sensor (8) and the pressure difference on the tub (3) or the evaporator (6) during the drying process. The control unit (9) calculates the pressure difference value (ΔP) between the instantaneous measurements of the first pressure sensor (7) and the second pressure sensor (8) during the drying process, obtains the pressure difference on the tub (3) or the evaporator (6) by using the calculated pressure difference value (ΔP), compares pressure difference value (ΔP) with the limit values determined by the manufacturer and decides that the laundry intended to be dried has reached the desired dryness rate when the pressure difference value (ΔP) reaches the limit values determined by the manufacturer.

- [0040] The total pressure of fluids moving in a duct is the sum of the dynamic pressure that is parallel to the flow direction and proportional to the fluid speed and of the static pressure that is vertical to the inner surface of the duct and proportional with the force the fluid applies on the surface of the duct. The components that create flow in the duct, like the fan, increase the total pressure while other fixed components create resistance to the flow, providing a decrease in the total pressure. Technically, the static pressure of the fluid decreases proportionally with the force it applies on the components that do not contribute to the flow. Therefore, the fan (5) in the laundry dryer (1) increases the total pressure of the process air (PA) and the evaporator (6) decreases the total pressure by hindering the flow of the process air (PA) by means of its finned structure. In the balanced state, the total pressure of the process air (PA) circulating inside the laundry dryer (1) is constant, in other words, the positive increase provided by the fan (5) and the negative loss on the evaporator (6) cancel each other.
- [0041] The drying process is performed by transferring the moisture on the laundry to the process air (PA) and the moisture carried by the process air (PA) condensing on the evaporator (6). The moisture contained in the laundry causes the pressure of the process air (PA) to be changed by

hindering the flow of the process air (PA). As the laundry gets dry, the amount of moisture contained therein decreases. The dryness rate of the laundry can be correlated with the pressure of the process air (PA) since the dryness rates of the laundry is correlated with the amount of moisture contained therein and the amount of moisture correlates with the pressure of the process air (PA). The limit values corresponding to the pressure difference value (ΔP) between the instantaneous measurements of the first pressure sensor (7) and the second pressure sensor (8) are obtained by the manufacturer as a result of experiments performed under different conditions and the obtained limit values are recorded in the memory of the control unit (9). During the drying process, the control unit (9) provides the measurement of the pressure of the process air (PA) by means of the first pressure sensor (7) and the second pressure sensor (8) before the tub (3) or the evaporator (6) and after the tub (3) or the evaporator (6) in the said order and calculates the pressure difference value (ΔP) by using the measured pressure values. The control unit (9) decides on the dryness rate of the laundry in the tub (3) by comparing the calculated pressure difference value (ΔP) with the limit values recorded in its memory.

[0042] In an embodiment of the present invention, the first pressure sensor (7) is disposed just before the tub (3) in the flow direction of the process air (PA) and the second pressure sensor (8) is disposed just after the tub (3) outlet in the flow direction of the process air (PA). The pressure of the process air (PA) before entering the tub (3) is measured by the first pressure sensor (7) disposed before the tub (3) in the flow direction of the process air (PA). The pressure of the process air (PA) after leaving the tub (3) is measured by the second pressure sensor (8) disposed after the tub (3) in the flow direction of the process air (PA). The laundry inside the tub (3) gets fluffy as the moisture is removed and shows an increasing resistance against the process air (PA). The resistance applied by the laundry against the process air (PA) is inversely proportional to the moisture contained therein, in other words, as the laundry gets dry, the pressure difference value (ΔP) between the pressure of the process air (PA) before the tub (3) and the pressure of the process air (PA) after the tub (3) increases.

Therefore, the pressure difference value (ΔP) between the pressure of the process air (PA) before entering the tub (3) and the pressure of the process air (PA) after leaving the tub (3) can be correlated with the dryness rates of the laundry. After the laundry is entirely dry, the process air (PA) flow is balanced and the pressure values do not change (Figure 2).

[0043] In another embodiment of the present invention, the first pressure sensor (7) is disposed just before the evaporator (6) in the flow direction of the process air (PA) and the second pressure sensor (8) is disposed just after the evaporator (6) outlet in the flow direction of the process air (PA). By means of the first pressure sensor (7) disposed before the evaporator (6) in the flow direction of the process air (PA), the pressure of the process air (PA) before entering the evaporator (6) is measured. By means of the second pressure sensor (8) disposed after the evaporator (6) in the flow direction of the process air (PA), the pressure of the process air (PA) after leaving the evaporator (6) is measured. The evaporator (6) forms a resistance against the process air (PA) flow due to its finned structure. In this situation, even if the laundry dryer (1) is not loaded with laundry, there is a difference between the value of the process air (PA) pressure before the evaporator (6) and the value after the evaporator (6). As the drying process starts, the moisture removed from the laundry condenses on the evaporator (6) and water is accumulated on the evaporator (6) as a film layer. The condensed water creates a resistance against the flow of the process air (PA) in addition to the self resistance of the evaporator (6). In the continuation of the drying process, the water condensed on the evaporator (6) is collected in a collection tray (not shown in the figures) and evaporates simultaneously. As the water that condenses as a film layer on the fins is discharged, the resistance that the water creates on the process air (PA) flow decreases. The effect of the moisture removed from the laundry to the pressure difference value (ΔP) of the pressure of the process air (PA) on the evaporator (6) is equal to the effect of an extra resistance that increases in time and then decreases in time. The pressure difference value (ΔP) increases after the drying starts due to the water

condensed on the evaporator (6), afterwards decreases towards its initial value as the water is discharged. Briefly, as the laundry dries, the pressure difference value (ΔP) decreases and approaches its initial value and the dryness rates of the laundry can be correlated with the pressure difference value (ΔP) on the evaporator (3) (Figure 3).

[0044] In an embodiment of the present invention, the control unit (9) ends the drying process when the pressure difference value (ΔP) reaches the limit values determined by the manufacturer that corresponds to the dryness rate selected by the user prior to the drying process. The user selects the desired dryness rate at the start of the drying process, like damp-dry for ironing, dry or extra dry by means of the program menu of the laundry dryer (1) and starts the drying process. The control unit (9) compares the limit value obtained as a result of experiments performed by the manufacturer under various conditions corresponding to the selected dryness rate with the calculated pressure difference value (ΔP) and ends the drying process by deciding that the desired dryness rate is realized when the pressure difference value (ΔP) reaches the limit value determined by the manufacturer.

[0045] In another embodiment of the present invention, the user can select the dryness rate after the drying process starts until the pressure difference value (ΔP) reaches the limit value determined by the manufacturer that corresponds to the desired dryness rate. However, if the pressure difference value (ΔP) exceeds the limit value determined by the manufacturer that corresponds to the dryness rate desired by the user, selecting the dryness rate is not possible.

[0046] In another embodiment of the present invention, the control unit (9) ends the drying process when the pressure difference value (ΔP) reaches the limit values determined by the manufacturer for different types and amounts of laundry. The control unit (9) calculates the pressure difference value (ΔP) between the first pressure sensor (7) and the second pressure sensor (8) at predetermined intervals during the drying process. The manufacturer determines the pressure difference values (ΔP) that are denoted as the limit values as a result of the experiments performed

related to the dryness rate of the different types of laundry like cotton, woolen, synthetic and of the different amounts of laundry. The said limit values are prerecorded in the memory of the control unit (9) by the manufacturer and when the pressure difference value (ΔP) reaches the limit values for the corresponding laundry type and amount, the control unit (9) ends the drying process.

[0047] In another embodiment of the present invention, the control unit (9) ends the drying process when the pressure difference value (ΔP) hardly changes for a time period determined by the manufacturer. As the laundry inside the tub (3) dries by removing the moisture, the pressure of the process air (PA) changes to a steady state and the pressure difference value (ΔP) between the first pressure sensor (7) and the second pressure sensor (8) fluctuates around a value within an interval that can be ignored. When the control unit (9) detects that the pressure difference value (ΔP) is almost unchanged for a time period determined by the manufacturer, ends the drying process by deciding that the laundry is entirely dry.

[0048] In another embodiment of the present invention, the control unit (9) ends the drying process when the pressure difference value (ΔP) reaches the limit values for different dryness rates determined by the manufacturer after a time period again determined by the manufacturer. After the drying process starts, the control unit (9) enables the drying process to continue for a time period determined by the manufacturer without taking into consideration the pressure difference value (ΔP). After the time period determined by the manufacturer, the control unit (9) compares the pressure difference value (ΔP) with the limit values recorded in its memory and enables the drying process to be ended when the pressure difference value (ΔP) reaches the limit values. By means of this embodiment, the control unit (9) is prevented from making a faulty decision by being mistaken due to irregularities that may be formed in the pressure difference value (ΔP) at the start of the drying process.

[0049] In another embodiment of the present invention, the control unit (9) monitors the increase/decrease of the pressure difference value (ΔP) and records the highest point of the pressure difference value (ΔP) in the same

drying cycle as the maximum pressure difference value ($\Delta P_{\max}$) between the instantaneous measurements of the first pressure sensor (7) and the second pressure sensor (8). The control unit (9) monitors the pressure difference value (ΔP) at intervals predetermined by the manufacturer, for example every other minute and tracks the trend of change in the pressure difference value (ΔP) on the evaporator (6). The trend of change in the pressure difference value (ΔP) is related to the amount of water kept on the evaporator (6) and can be used as an indicator of how efficient the evaporator (6) operates. When the film layer formed by the water condensed on the evaporator (6) reaches its thickest state, in other words, at the moment when the evaporator (6) holds the maximum amount of water, the pressure difference value (ΔP) reaches its maximum value. The control unit (9) records the said maximum value as the maximum pressure difference value ($\Delta P_{\max}$).

- [0050] In another embodiment of the present invention, the control unit (9) records the pressure difference value (ΔP) at the start of the drying process as the first pressure difference value (ΔP_i) and ends the drying process when the pressure difference value (ΔP) almost reaches the first pressure difference value (ΔP_i). When the laundry is dried, the film layer formed of water on the evaporator (6) is removed and the pressure difference value (ΔP) on the evaporator (6) almost reaches the first pressure difference value (ΔP_i) at the start of the drying cycle. The control unit (9) ends the drying process when the pressure difference value (ΔP) reaches the first pressure difference value (ΔP_i).
- [0051] In another embodiment of the present value, the control unit (9) ends the drying process and when the instantaneous pressure difference value (ΔP) reaches the limit values for different dryness rates determined by the manufacturer after the instantaneous pressure difference value (ΔP) is smaller than the previous difference value for a determined number of times in the same drying cycle. In the situation wherein the pressure measurement of the process air (PA) is performed particularly at the evaporator (6) region, the amount of water accumulated on the evaporator (6) increases the pressure difference value (ΔP). As the drying process

continues, the water on the evaporator (6) is discharged and the pressure difference value (ΔP) starts to decrease. In this situation, the pressure difference value (ΔP) reaches the limit values determined by the manufacturer twice in the same drying cycle, corresponding to for example the limit value the damp-dry rate for ironing. The control unit (9) is enabled to first wait for the pressure difference value (ΔP) to decrease and thus prevented from ending the drying process while the laundry is not yet dry, in other words while water still continues to be accumulated on the evaporator (6).

- [0052] In another embodiment of the present invention, the laundry dryer (1) comprises at least one sensor (not shown in the figures) that is disposed on the body (2) and that provides the measurement of factors like temperature, conductivity, moisture that the control unit (9) controls for detecting dryness. In this embodiment, the dryness rate detected by the first pressure sensor (7) and the second pressure sensor (8) is controlled for a second time by using the sensors and thus the error margin is decreased.
- [0053] In another embodiment of the present invention, the laundry dryer (1) also has the function of washing laundry. In this embodiment, the laundry is both washed and dried in the desired dryness rate after washing.
- [0054] In the laundry dryer (1) of the present invention, the dryness rate of the laundry is detected by means of the first pressure sensor (7) and the second pressure sensor (8) by making use of the laundry creating the difference in the process air (PA) pressure on the tub (3) or the evaporator (6) and by means of the control unit (9) the laundry as dry as desired by the user is obtained. In addition to the consumer satisfaction, the drying process is completed in optimum time by accurate dryness detection and energy consumption is decreased. By means of the present invention, deformation of laundry due to over-drying is prevented and furthermore by monitoring the pressure difference value (ΔP), information about evaporator (6) efficiency can be obtained.

Claims

1. A laundry dryer (1) **comprising** a body (2); a tub (3) disposed inside the body (2) and wherein the drying process is performed; an air duct (4) wherein the circulation of the process air (PA) is performed; a fan (5) that is disposed on the air duct (4) and that provides the circulation of the process air (PA) and an evaporator (6) that is disposed inside the air duct (4) and that condenses the humid process air (PA), **characterized by** a first pressure sensor (7) and a second pressure sensor (8) that are disposed in the air duct (4) and that provide the measurement of the pressure of the process air (PA) and a control unit (9) that decides whether or not the laundry has reached the desired dryness rate by calculating the pressure difference value (ΔP) between the instantaneous measurements of the first pressure sensor (7) and the second pressure sensor (8) and the pressure difference on the tub (3) or the evaporator (6) during the drying process.
2. A laundry dryer (1) as in Claim 1, **characterized by** the first pressure sensor (7) disposed just before the tub (3) inlet in the flow direction of the process air (PA) and the second pressure sensor (8) disposed just after the tub (3) outlet in the flow direction of the process air (PA).
3. A laundry dryer (1) as in any one of the above claims, **characterized by** the first pressure sensor (7) disposed just before the evaporator (6) in the flow direction of the process air (PA) and the second pressure sensor (8) disposed just after the evaporator (6) in the flow direction of the process air (PA).
4. A laundry dryer (1) as in any one of the above claims, **characterized by** the control unit (9) that ends the drying process when the pressure difference value (ΔP) reaches the limit value determined by the manufacturer that corresponds to the dryness rate selected by the user prior to the drying process.
5. A laundry dryer (1) as in any one of the above claims,, **characterized by** the control unit (9) that ends the drying process when the pressure difference value (ΔP) reaches the limit values determined by the manufacturer for different types and amounts of laundry.
6. A laundry dryer (1) as in any one of the above claims, **characterized by** the control unit (9) that ends the drying process when the pressure difference

value (ΔP) is almost unchanged for a time period determined by the manufacturer.

7. A laundry dryer (1) as in any one of the above claims, **characterized by** the control unit (9) that ends the drying process when the pressure difference value (ΔP) reaches the limit values for different dryness rates determined by the manufacturer after a time period again determined by the manufacturer.
8. A laundry dryer (1) as in Claim 3, **characterized by** the control unit (9) that monitors the increase/decrease of the pressure difference value (ΔP) and records the highest point of the pressure difference value (ΔP) as the maximum pressure difference value ($\Delta P_{\max}$)
9. A laundry dryer (1) as in Claim 3, **characterized by** the control unit (9) that records the pressure difference value (ΔP) at the start of the drying process as the first pressure difference value (ΔP_i) and ends the drying process when the pressure difference value (ΔP) almost reaches the first pressure difference value (ΔP_i).
10. A laundry dryer (1) as in Claim 3, **characterized by** the control unit (9) that ends the drying process and when the instantaneous pressure difference value (ΔP) reaches the limit values for different dryness rates determined by the manufacturer after the instantaneous pressure difference value (ΔP) is smaller than the previous difference value for a determined number of times in the same drying cycle.
11. A laundry dryer (1) as in any one of the above claims, **characterized by** at least one sensor that is disposed on the body (2) and that provides the measurement of factors like temperature, conductivity, moisture that the control unit (9) controls for detecting dryness.
12. A laundry dryer (1) as in any one of the above claims, that has the function of washing laundry.

Figure 1

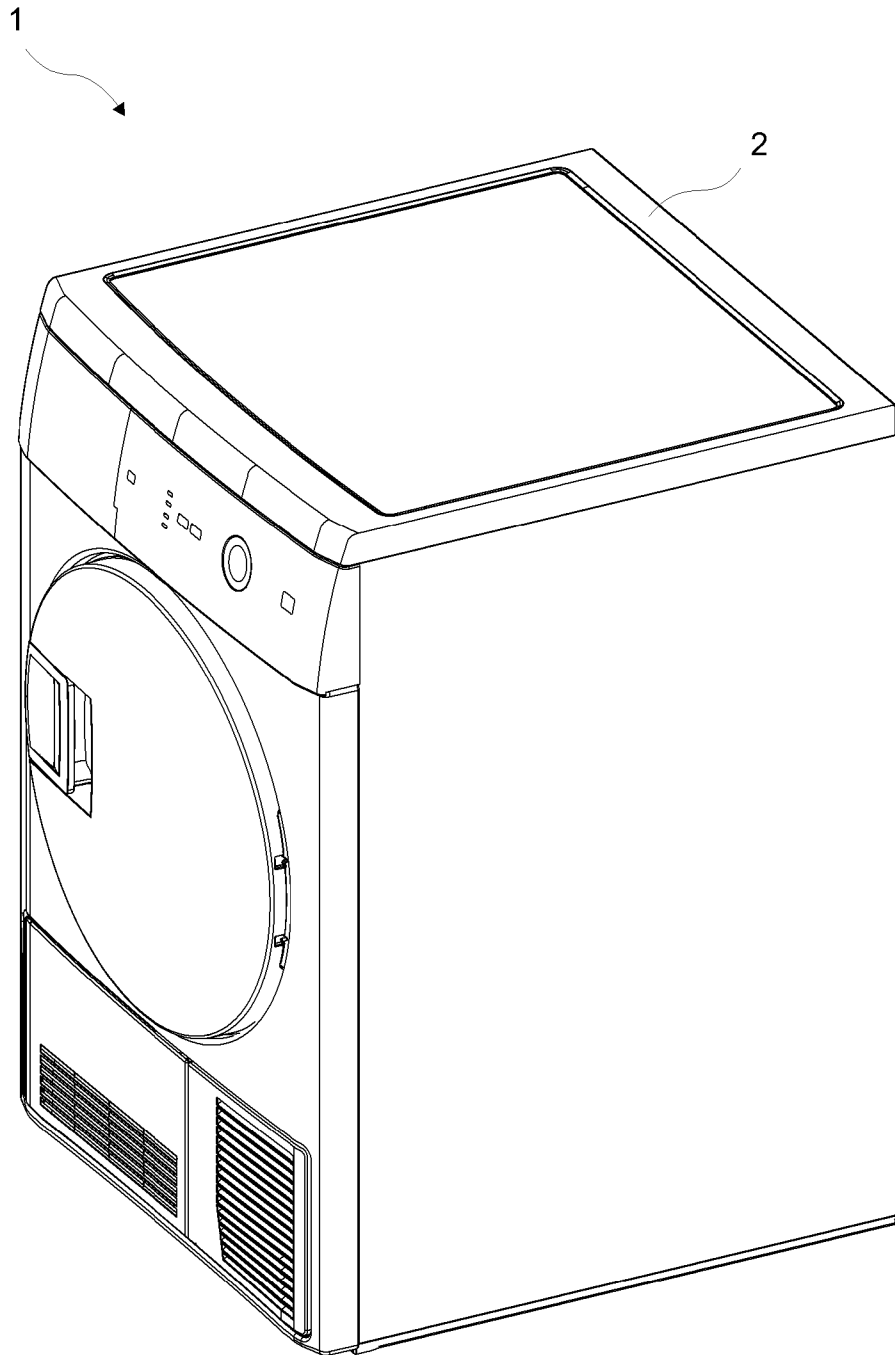


Figure 2

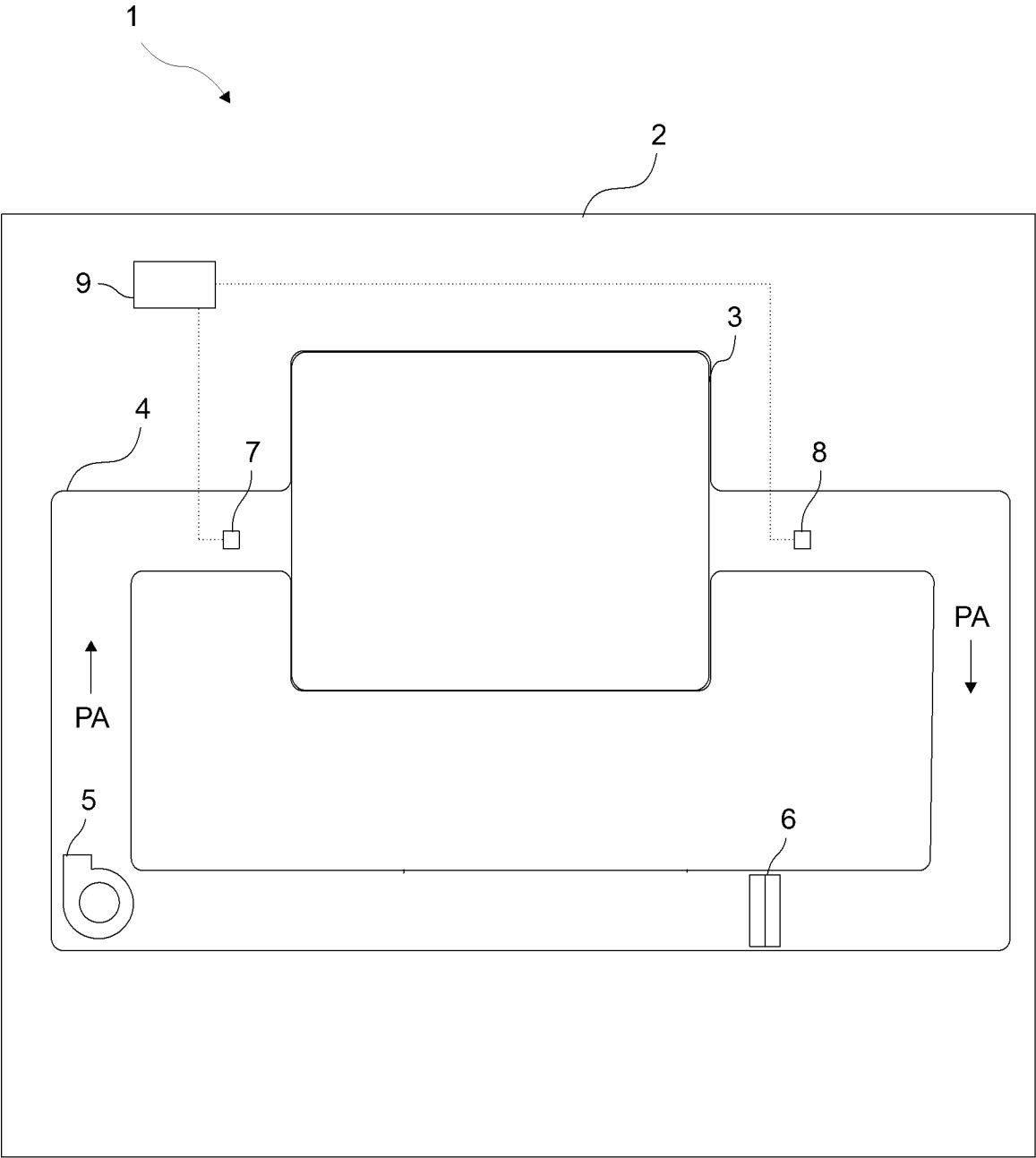
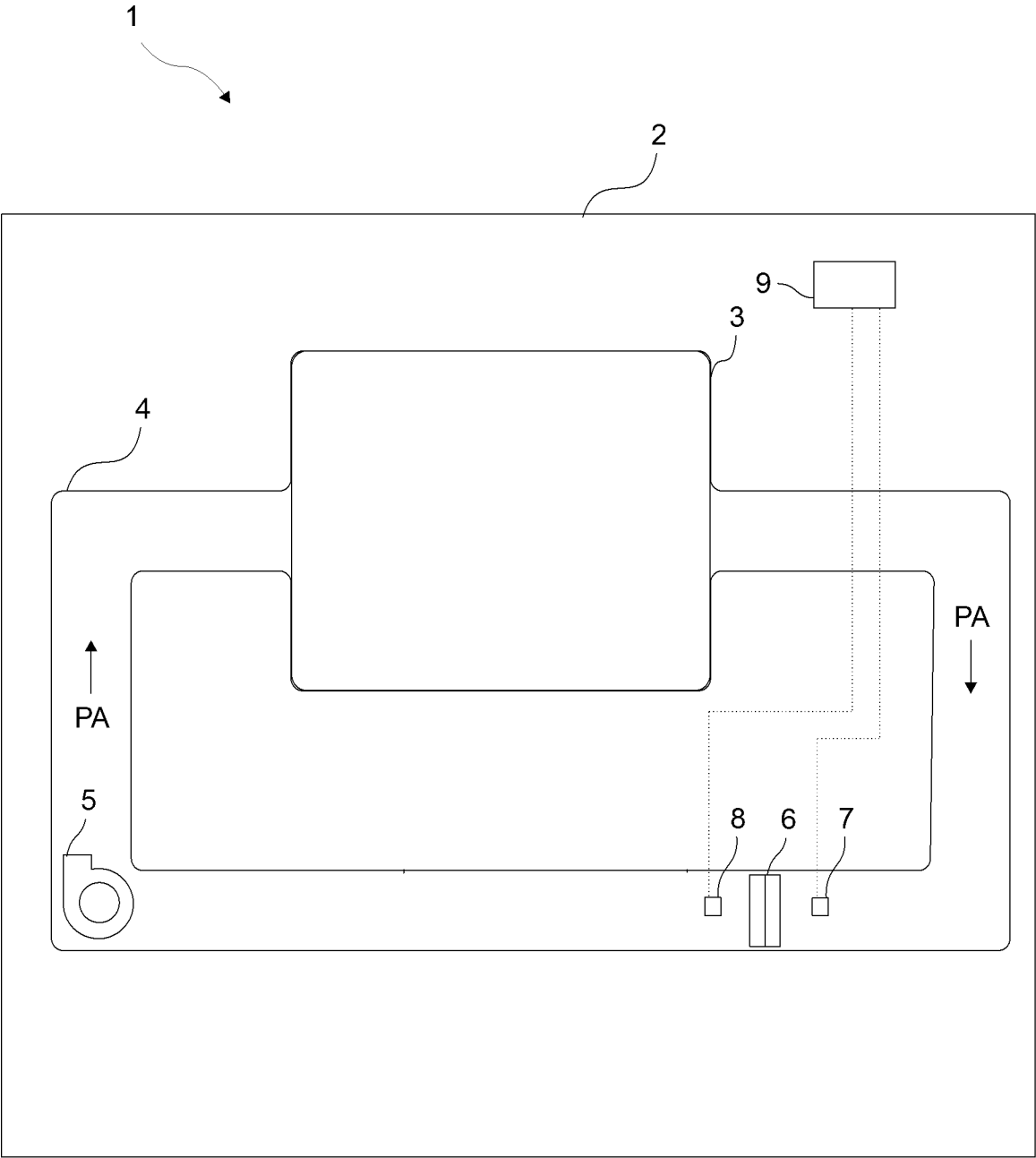


Figure 3



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/069992

A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F58/28
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	DE 196 13 310 A1 (MIELE & CIE [DE]) 10 October 1996 (1996-10-10) column 2, lines 48-68; figure 1 -----	1-12
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Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

11 November 2015

Date of mailing of the international search report

20/11/2015

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Kirner, Katharina

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/069992

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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