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(54) **LAUNDRY DRYER WITH FAN**

(57) Disclosed is a laundry dryer (100) with a fan (6), including a cabinet (1) and a drying chamber (2), and the fan (6) having a primary air channel (11) formed by a housing (10), where the housing (10) is covered by a cover (12) outside, a secondary air channel (15) having an inlet (13) and an outlet (14) is formed between the cover (12) and the housing (10), impellers (62) rotating with a rotator (61) of a motor are provided in the secondary air channel (15), the impellers (62) are such disposed that when the impellers (62) rotate with the rotator (61), air is driven to enter the secondary air channel (15) from the inlet (13) of the secondary air channel (15) and exit from the outlet (14) of the secondary air channel (15), the inlet (13) and the outlet (14) of the secondary air channel (15) respectively extend by using a first pipe (16) and a second pipe (17), and an outlet (14) of the second pipe (17) is close to an apparatus that needs to be cooled in the cabinet (1). In this way, the secondary air channel (15) can guide an airflow to the apparatus that needs to be cooled, and when flowing through the secondary air channel (15), the air further cools the motor of the fan (6) itself.

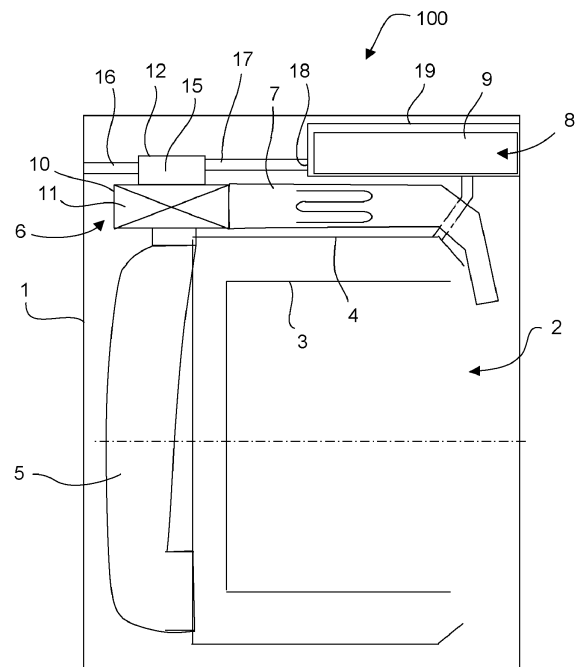


FIG. 1

Description

[0001] The present invention relates to a fan of a laundry dryer.

[0002] A high temperature is generally produced on some parts in an operation process of a laundry dryer. For example, a temperature of a motor driving a drying barrel to rotate rises, an air heating channel heating air causes temperatures of surrounding parts to rise, a temperature of a fan motor driving air flow rises, and a temperature of a circuit board rises after operation for a long time. Excessively high temperatures of these parts may affect performance and lives of the parts. Therefore, cooling or heat insulation for these parts needs to be considered by designers. In addition, it is also desired by designers to cool walls of a drying chamber so that the drying chamber itself has a condensation effect to some extent.

[0003] These cooling or heat insulation measures above may be implemented by means of providing a heat insulation pad or additionally providing a fan. However, the heat insulation pad does not have a desirable effect, and cannot be used for some parts. It is also undesirable to provide a fan dedicatedly for a cooling purpose inside a body of the dryer. A fan occupies a relatively large space, consequently increasing a size of the dryer and increasing great costs at the same time.

[0004] An objective of the present invention is to modify a fan in a laundry dryer, so that the fan can provide an additional cooling function without changes of an original function and performance of the fan.

[0005] For the foregoing objective, the present invention provides a laundry dryer as claimed in the independent claim. Preferred facultative embodiments of the invention are claimed in dependent claims, described in the subsequent disclosure and exhibited in the attached drawing. The invention also includes combinations of such preferred embodiments as disclosed as further facultative preferred embodiments.

[0006] Accordingly the present invention provides a laundry dryer with a fan, including a cabinet and a drying chamber, and the fan having a primary air channel formed by a housing, where the housing is covered by a cover outside, a secondary air channel having an inlet and an outlet is formed between the cover and the housing, impellers rotating with a rotator of a motor are provided in the secondary air channel, the impellers are disposed such that when the impellers rotate with the rotator, air is driven to enter the secondary air channel from the inlet of the secondary air channel and exit from the outlet of the secondary air channel, the inlet and the outlet of the secondary air channel respectively extend by using a first pipe and a second pipe, and an outlet of the second pipe is close to an apparatus that needs to be cooled in the cabinet.

[0007] The fan in the present invention has both the primary air channel and the secondary air channel. The primary air channel can fulfill an original function, and the

secondary air channel can guide an airflow to the apparatus that needs to be cooled. In addition, when flowing through the secondary air channel, the air further cools the motor of the fan itself. In the present invention, modification to the fan is minor, costs are low, the newly added parts occupy a small space, and the cabinet and other parts of the laundry dryer do not need to be modified.

[0008] Preferably, the inlet of the secondary air channel introduces ambient air from the outside of the cabinet through the first pipe. In this way, not only air in the cabinet is not unnecessarily disturbed, but also a temperature of the ambient air is usually lower than a temperature of the air in the cabinet.

[0009] The apparatus that needs to be cooled includes at least one of a circuit system, an outer wall of the drying chamber, and a detergent adding apparatus, where the detergent adding apparatus is installed closely to a heat source.

[0010] The detergent adding apparatus includes an accommodating chamber adapted to store a detergent for multiple washing processes, and the outlet of the second pipe faces the accommodating chamber. Air from the secondary air channel removes heat of the accommodating chamber, reduces a temperature in the accommodating chamber, thereby avoiding deterioration of the detergent or a decrease in chemical performance of the detergent due to a high temperature.

[0011] The fan is disposed neighboring an air heating channel that heats air entering the drying chamber, and the inlet and the outlet of the secondary air channel of the fan are isolated from an ambient space in which the air heating channel is located. In this way, rotation of the impellers does not disturb ambient air of the air heating channel, thereby avoiding a heat loss of the air heating channel arising therefrom.

[0012] At least a part of the rotator of the motor of the fan is located in the secondary air channel between the housing and the cover, and the impellers are disposed in a peripheral direction of the part of the rotator of the motor that is located in the secondary air channel. In such a setting manner, an occupied space is small, a structure is simple, and manufacturing costs are low.

[0013] The present invention is further described below with reference to the accompanying drawing.

[0014] The disclosure will become more fully understood from the detailed description of preferred embodiments exhibited in the drawing, given herein below for illustration only, and thus are not limitative of the disclosure. In the drawing:

FIG. 1 is a schematic structural diagram of a dryer; and

FIG. 2 is three-dimensional diagrams of a housing and a cover of a fan in a separate state.

[0015] As shown in FIG. 1, a laundry dryer 100 has a cabinet 1. A drying chamber 2 is provided in the cabinet

1. The drying chamber 2 includes a rotatable drum 3 and a tub 4 located outside the drum 3. Spaces of the drum 3 and the tub 4 communicate. Pieces of laundry are dried in the drum 3. The tub 4 sequentially connects to a condensation channel 5, a fan 6, and an air heating channel 7. An outlet of the air heating channel 7 communicates with the space of the tub 4 again. After the fan 6 is started, air is driven to sequentially circulate in a direction of the fan 6, the air heating channel 7, the drying chamber 2, the condensation channel 5, and the fan 6.

[0016] In the specific implementation shown in FIG. 1, the laundry dryer 100 further includes a detergent adding apparatus 8. The detergent adding apparatus 8 includes an accommodating chamber 9 adapted to store a detergent for multiple washing processes. The detergent adding apparatus 8 is disposed neighboring the air heating channel 7. Therefore, heat radiating from the air heating channel 7 causes a temperature of the detergent adding apparatus 8 to increase.

[0017] With reference to FIG. 1 in combination with FIG. 2, the fan 6 has a primary air channel 11 formed by a housing 10. The primary air channel 11 is in fluid communication with the drying chamber 2 and the air heating channel 7. The housing 10 is covered by a cover 12 outside. A secondary air channel 15 having an inlet 13 and an outlet 14 is formed between the cover 12 and the housing 10. The inlet 13 and the outlet 14 of the secondary air channel 15 respectively extend by using a first pipe 16 and a second pipe 17. At least a part of a rotator 61 of a motor of the fan 6 is located in the secondary air channel 15 between the housing 10 and the cover 12. Impellers 62 are provided in a peripheral direction of the part of the rotator 61 of the motor that is located in the secondary air channel 15. When the impellers 62 rotate with the rotator 61, air is driven to enter the secondary air channel 15 from the inlet 13 of the secondary air channel 15 and exit from the outlet 14 of the secondary air channel 15.

[0018] The inlet 13 of the secondary air channel 15 connects to the outside of the cabinet 1 by using the first pipe 16, so as to introduce ambient air with a lower temperature from the outside of the cabinet 1.

[0019] An end of the second pipe 17 connecting to the outlet 14 of the secondary air channel 15 connects to a frame 19 provided around a detergent accommodating chamber 9. An outlet 18 of the second pipe 17 faces the accommodating chamber 9. Therefore, after ambient air with a lower temperature enters the secondary air channel 15, some heat of the fan 6 is removed, and the ambient air continues flowing and blows into the detergent accommodating chamber 9, thereby cooling the detergent accommodating chamber 9. The outlet 14 of the secondary air channel 15 is isolated by using the frame 19 from an ambient space in which the air heating channel 7 is located.

[0020] In another implementation not shown in FIG. 1, the outlet 18 of the second pipe 17 may be close to another apparatus that needs to be cooled, for example, a

circuit system or an outer wall of the drying chamber 2. However, when the circuit system or the drying chamber 2 is cooled, the outlet 18 of the second pipe 17 is preferably far away from the ambient space in which the air heating channel 7 is located, and is better isolated therefrom in space.

REFERENCE NUMERALS

10 **[0021]**

1	Cabinet
2	Drying chamber
3	Drum
4	Tub
5	Condensation channel
6	Fan
7	Air heating channel
8	Detergent adding apparatus
9	Accommodating chamber
10	Housing
11	Primary air channel
12	Cover
13	Inlet
14	Outlet
15	Secondary air channel
16	First pipe
17	Second pipe
18	Outlet
19	Frame
61	Rotator
62	Impeller
100	Laundry dryer

Claims

1. A laundry dryer (100) with a fan (6), comprising a cabinet (1) and a drying chamber (2), and the fan (6) having a primary air channel (11) formed by a housing (10), **characterized in that** the housing (10) is covered by a cover (12) outside, a secondary air channel (15) having an inlet (13) and an outlet (14) is formed between the cover (12) and the housing (10), impellers (62) rotating with a rotator (61) of a motor are provided in the secondary air channel (15), the impellers (62) are such disposed that when the impellers (62) rotate with the rotator (61), air is driven to enter the secondary air channel (15) from the inlet (13) of the secondary air channel (15) and exit from the outlet (14) of the secondary air channel (15), the inlet (13) and the outlet (14) of the secondary air channel (15) respectively extend by using a first pipe (16) and a second pipe (17), and an outlet (14) of the second pipe (17) is close to an apparatus (2, 8) that needs to be cooled in the cabinet (1).

2. The laundry dryer (100) according to claim 1, **characterized in that** the inlet (13) of the secondary air channel (15) introduces ambient air from the outside of the cabinet (1) through the first pipe (16). 5
3. The laundry dryer (100) according to claim 1, **characterized in that** the apparatus (2, 8) that needs to be cooled comprises at least one of a circuit system, an outer wall of the drying chamber (2), and a detergent adding apparatus (8), wherein the detergent adding apparatus (8) is installed closely to a heat source. 10
4. The laundry dryer (100) according to claim 3, **characterized in that** the detergent adding apparatus (8) comprises an accommodating chamber (9) adapted to store a detergent for multiple washing processes, and the outlet (14) of the second pipe (17) faces the accommodating chamber (9). 15 20
5. The laundry dryer (100) according to claim 1, **characterized in that** the fan (6) is disposed neighboring an air heating channel (7) that heats air entering the drying chamber (2), and the inlet (13) and the outlet (14) of the secondary air channel (15) of the fan (6) are isolated from an ambient space in which the air heating channel (8) is located. 25
6. The laundry dryer (100) according to claim 1, **characterized in that** at least a part of the rotator (61) of the motor of the fan (6) is located in the secondary air channel (15) between the housing (10) and the cover (12), and the impellers (62) are disposed in a peripheral direction of the part of the rotator (61) of the motor that is located in the secondary air channel (15). 30 35

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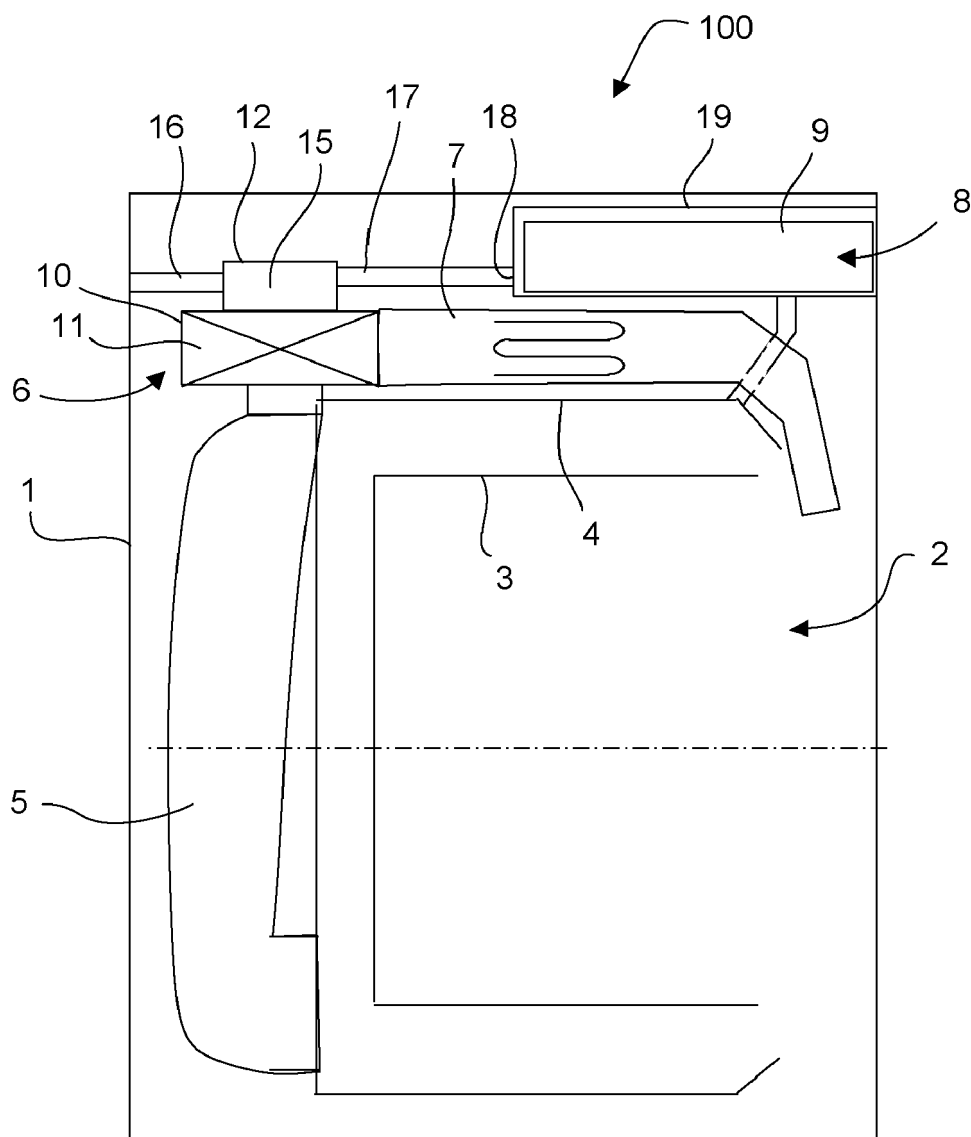


FIG. 1

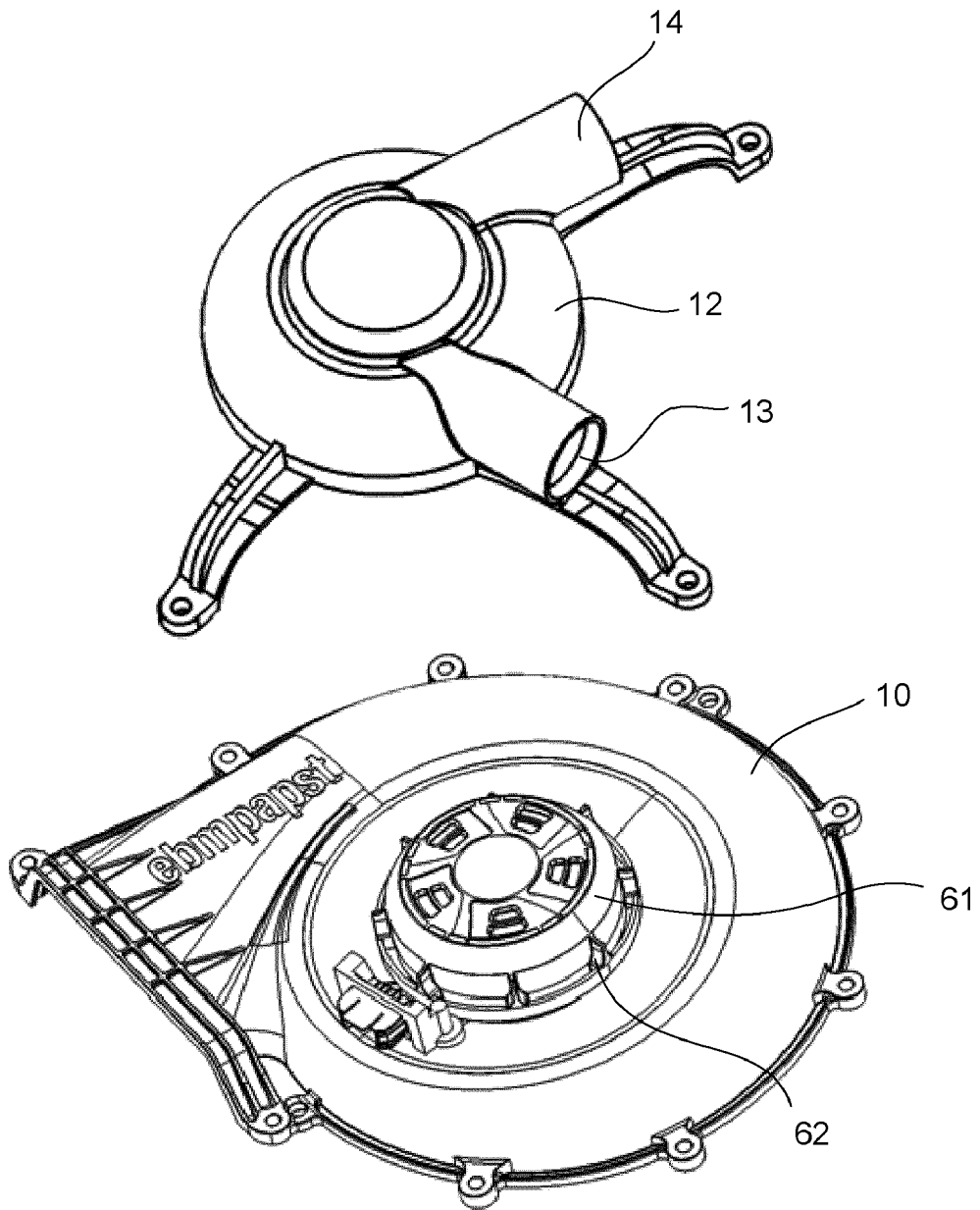


FIG. 2



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Application Number
EP 17 18 2738

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Place of search Munich		Date of completion of the search 20 September 2017	Examiner Kising, Axel
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