



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.05.2018 Bulletin 2018/21

(51) Int Cl.:
D06F 58/02 (2006.01) **D06F 58/24** (2006.01)
D06F 58/26 (2006.01) **D06F 58/28** (2006.01)

(21) Application number: **17201992.9**

(22) Date of filing: **16.11.2017**

(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

(30) Priority: **22.11.2016 CN 201611034914**

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(54) **A CLOTHES DRYER COMPRISING AN AIR HEATING TUNNEL**

(57) A laundry drying machine having an air heating channel (3) is provided. A heating apparatus (6) is disposed in the air heating channel (3). The upstream of the air heating channel (3) is connected to a condensation channel (4) and a blowing apparatus (5), and the downstream is connected to a drying compartment (2). A water blocking structure (10) that blocks water and a water guiding structure (20) that guides blocked water out of the air heating channel (3) are disposed on the bottom of the air heating channel (3). Under the combined effect of the water blocking structure (10) and the water guiding structure (20), water that enters the air heating channel (3) is blocked and discharged, so as to avoid an adverse impact brought by the water in the air heating channel (3) or prevent the water from entering the drying compartment (2) and wetting laundry.

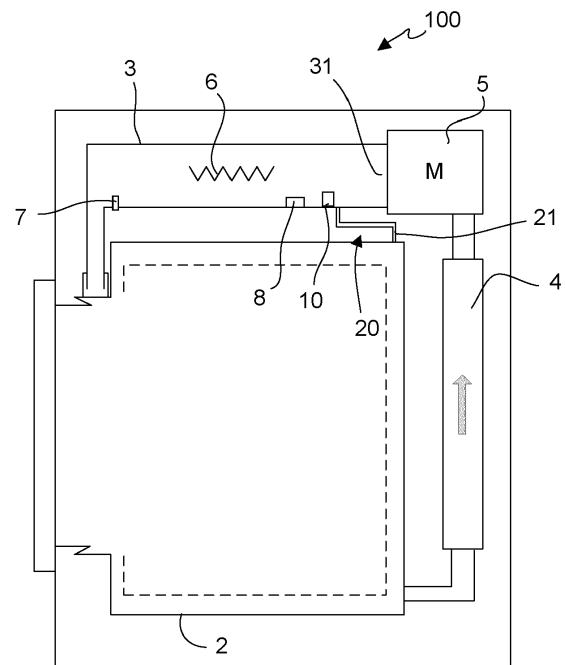


FIG. 1

Description

[0001] The present invention relates to a laundry drying machine having an air heating channel, and in particular, to an air heating channel for use in such laundry drying machine.

[0002] A laundry drying machine usually has a drying compartment for holding laundry to be dried. The drying compartment is connected to a condensation channel, a blowing apparatus, and an air heating channel. An outlet of the air heating channel is finally connected to the drying compartment.

[0003] In a drying process, when high-temperature and high-humidity air passes through the condensation channel, most water carried in the air is condensed to be separated from the air, but the air at this time further carries some of water. When the air flows through the blowing apparatus, water carried in the air is condensed on a housing of the blowing apparatus because of a temperature difference between the inside and outside of the casing of the blowing apparatus. The condensed water enters the air heating channel at the downstream of the blowing apparatus under the effect of airflow.

[0004] In addition, the condensed water in the condensation channel and/or cooling water for heat exchange also enter(s) the air heating channel under the effect of the blowing apparatus.

[0005] The water that enters the air heating channel brings an abnormal change to a surface of the air heating channel, and abnormal control to signal collection of a temperature sensor. The water enters the drying compartment from the air heating channel and wets laundry, and even a temperature fuse is abnormal, leading to various risks.

[0006] An objective of the present invention is to discharge water that enters an air heating channel.

[0007] To achieve the foregoing objective, the present invention provides a laundry drying machine having an air heating channel, where a heating apparatus is disposed in the air heating channel, the upstream of the air heating channel is connected to a condensation channel and a blowing apparatus, and the downstream is connected to a drying compartment. A water blocking structure that blocks water and a water guiding structure that guides blocked water out of the air heating channel are disposed on the bottom of the air heating channel. Under the combined effect of the water blocking structure and the water guiding structure, the water that enters the air heating channel is blocked and discharged, so as to avoid an adverse impact brought by the water in the air heating channel or prevent the water from entering the drying compartment and wetting laundry. The laundry drying machine includes various machines that may perform drying operations on laundry.

[0008] The water blocking structure may be implemented as a groove formed on a bottom wall of the air heating channel. After the water enters the groove, a flowing path is cut off.

[0009] The water guiding structure includes a water guiding hole formed on the bottom of the groove, and a water guiding channel connected to the water guiding hole. Through the water guiding structure, the water in the groove is guided out.

[0010] The water blocking structure may alternatively be implemented as a water blocking portion that rises up from a bottom surface of the air heating channel.

[0011] The water guiding structure may include a water guiding hole formed at the upstream of the water blocking portion and disposed close to the water blocking portion, and a water guiding channel connected to the water guiding hole.

[0012] The water blocking portion may be a protrusion integrated with the bottom wall of the air heating channel or a water blocking plate connected to the bottom wall of the air heating channel.

[0013] As a preferable supplemental solution, the water blocking structure is close to the inlet of the air heating channel. Therefore, most air heating channels are not affected by water.

[0014] Preferably, the water blocking structure is located at the upstream of the heating apparatus.

[0015] Preferably, electronic components are disposed in the air heating channel, and the water blocking structure is located at the upstream of the electronic components. In this way, normal work and service life of the electronic components are ensured. The electronic components may include a sensor and a temperature fuse.

[0016] Preferably, the water blocking structure is a long-narrow structure, and has an extension direction crossed with an air flow direction in the air heating channel. Water that enters the air heating channel flows with airflow, and has a flow direction consistent with the air flow direction. The water blocking structure crossed with the air flow direction cuts off the water flow direction.

[0017] The "upstream" and "downstream" in this specification refer to the upstream and downstream of a flow direction of air blown by the blowing apparatus.

[0018] The following further describes preferred embodiments of the present invention with reference to the figures of the accompanying drawing.

FIG. 1 is a schematic structural diagram of main components of a laundry drying machine;

FIG. 2A is a schematic sectional view of a water blocking structure along a water flow direction in a first implementation;

FIG. 2B is a schematic sectional view of a water blocking structure along a water flow direction in a second implementation; and

FIG. 2C is a schematic sectional view of a water blocking structure along a water flow direction in a third implementation.

[0019] As shown in FIG. 1, a laundry drying machine 100 has a drying compartment 2 that accommodates laundry, and an air heating channel 3 that is in fluid communication of the drying compartment 2. A heating apparatus 6 is disposed in the air heating channel 3, to heat flowing air. The upstream of the air heating channel 3 is connected to a condensation channel 4 and a blowing apparatus 5, and the downstream is connected to the drying compartment 2. The other end of the condensation channel 4 is connected to the drying compartment 2. In a drying procedure running process, the blowing apparatus 5 drives air to flow. Therefore, the air enters the drying compartment 2 after being heated in the air heating channel 3. The high-temperature hot air exchanges heat with laundry in the drying compartment 2, and water in the laundry evaporates, and enters the condensation channel 4 with the air. Most of the water in the air is condensed in the condensation channel 4 and becomes liquid again to be discharges, and the remaining part of the water continues to enter the blowing apparatus 5 with the air under the effect of the blowing apparatus 5. Driven by high-speed air, the water formed through condensation in the blowing apparatus 5 enters the air heating channel 3 at the downstream of the blowing apparatus 5. When cooling water is input to the condensation channel 4, some of the cooling water also enters the air heating channel 3.

[0020] To block the water that enters the air heating channel 3, a water blocking structure 10, and a water guiding structure 20 that guides blocked water out of the air heating channel 3 are disposed on the bottom of the air heating channel 3.

[0021] To avoid the effect of the water, the water blocking structure 10 should be disposed at the upstream of electronic components such as a sensor 7 and a temperature fuse 8. The water blocking structure 10 may alternatively be located at the upstream of the heating apparatus 6. Preferably, the water blocking structure 10 is close to an inlet 31 of the air heating channel 3.

[0022] The water blocking structure 10 is a long-narrow structure, and has an extension direction crossed with an air flow direction in the air heating channel 3.

[0023] The water guiding structure 20 includes a water guiding channel 21. An outlet of the water guiding channel 21 is connected to the bottom of the drying compartment 2, or another mechanism such as the condensation channel 4, so as to discharge water.

[0024] As shown in FIG. 2A, the water blocking structure 10 may be implemented as a groove 11 formed on a bottom wall 32 of the air heating channel 3. A water guiding hole 22 is disposed on the bottom of the groove 11. The water guiding channel 21 is connected to the water guiding hole 22. The water guiding hole 22 constitutes a part of the water guiding structure 20.

[0025] As shown in FIG. 2B, the water blocking structure 10 may alternatively be implemented as a protrusion 12 that integrally rises up from a bottom surface 33 of the air heating channel 3. The water guiding hole 23 is

formed at the upstream of the protrusion 12 and is disposed close to the protrusion 12.

[0026] As shown in FIG. 2C, the water blocking structure 10 may alternatively be implemented as a water blocking plate 13 connected to the bottom wall 32 of the air heating channel 3. The water guiding hole 24 is formed at the upstream of the water blocking plate 13 and disposed close to the water blocking plate 13.

Claims

1. A laundry drying machine having an air heating channel (3), wherein a heating apparatus (6) is disposed in the air heating channel (3), the upstream of the air heating channel is connected to a condensation channel (4) and a blowing apparatus (5), and the downstream is connected to a drying compartment (2), **characterized in that** a water blocking structure (10) that blocks water and a water guiding structure (20) that guides blocked water out of the air heating channel are disposed on a bottom of the air heating channel.
2. The laundry drying machine according to claim 1, **characterized in that** the water blocking structure is a groove (11) formed on a bottom wall (32) of the air heating channel (3).
3. The laundry drying machine according to one of claims 1 and 2, **characterized in that** the water guiding structure comprises a water guiding hole (22) formed on the bottom of the groove (11), and a water guiding channel (21) connected to the water guiding hole.
4. The laundry drying machine according to any preceding claim, **characterized in that** the water blocking structure is a water blocking portion (12, 13) that rises up from a bottom surface (33) of the air heating channel (3).
5. The laundry drying machine according to claim 4, **characterized in that** the water guiding structure comprises a water guiding hole (23, 24) formed at the upstream of the water blocking portion (12, 13) and disposed close to the water blocking portion, and a water guiding channel (21) connected to the water guiding hole.
6. The laundry drying machine according to one of claims 4 and 5, **characterized in that** the water blocking portion is a protrusion (12) integrated with a bottom wall (32) of the air heating channel (3).
7. The laundry drying machine according to one of claims 4 to 6, **characterized in that** the water blocking portion is a water blocking plate (13) connected

to a bottom wall (32) of the air heating channel (3).

8. The laundry drying machine according to any preceding claim, **characterized in that** the water blocking structure is located at the upstream of the heating apparatus (3). 5
9. The laundry drying machine according to any preceding claim, **characterized in that** electronic components (7, 8) are disposed in the air heating channel (3), and the water blocking structure (10) is located at the upstream of the electronic components. 10
10. The laundry drying machine according to claim 9, **characterized in that** the electronic components comprise a sensor (7) and a temperature fuse (8). 15
11. The laundry drying machine according to any preceding claim, **characterized in that** the water blocking structure (10) is close to an inlet (31) of the air heating channel (3). 20
12. The laundry drying machine according to any preceding claim, **characterized in that**, the water blocking structure (10) is a long-narrow structure, and has an extension direction crossed with an air flow direction in the air heating channel (3). 25

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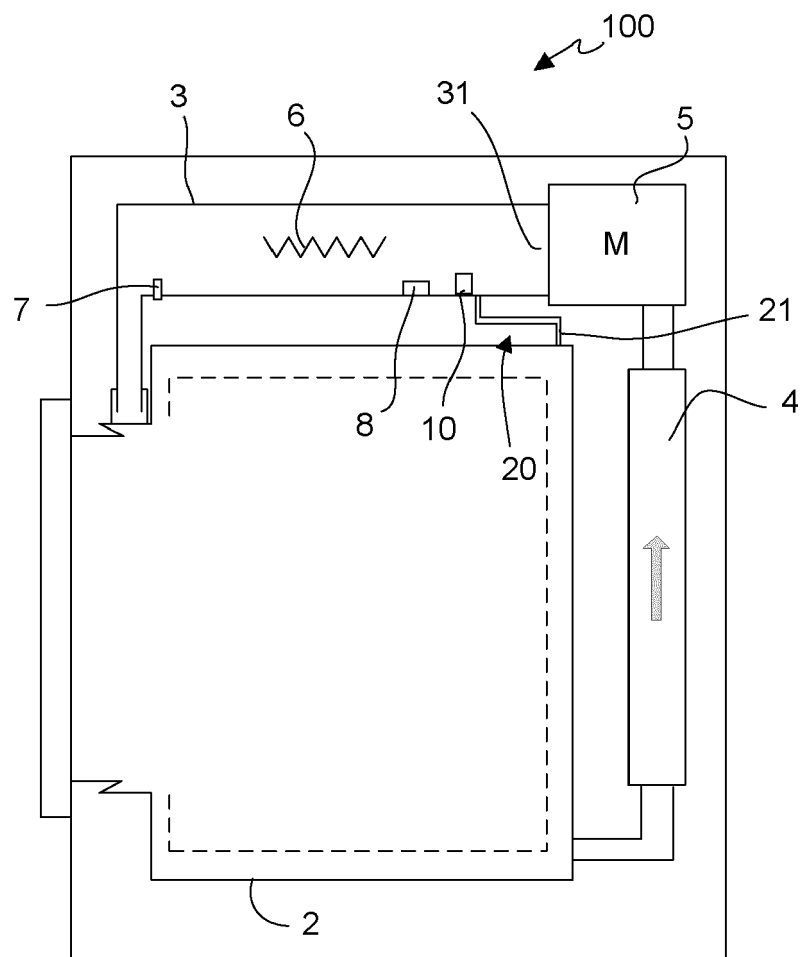


FIG. 1

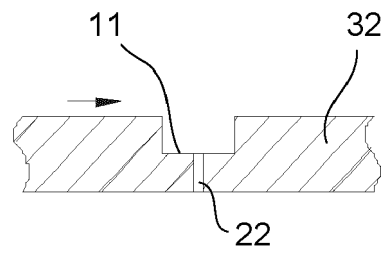


FIG. 2A

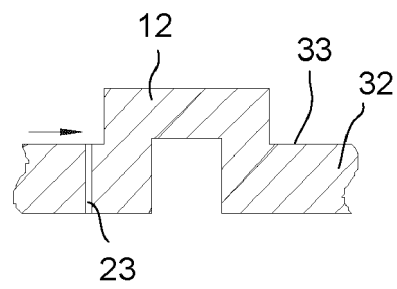


FIG. 2B

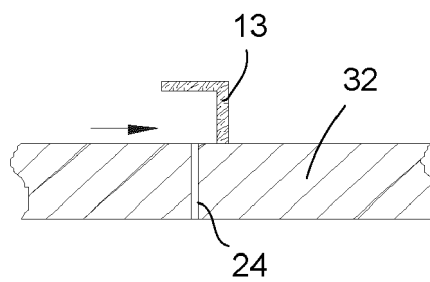


FIG. 2C



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Application Number
EP 17 20 1992

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 February 2018	Examiner Kising, Axel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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