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by at least one part of the passage (22) is made of a foam material. A fabric drying apparatus (10) is also provided, which includes a rotatable drum (4) for accommodating fabrics and the air heating passage (20) for heating air and sending the heated air into the drum (4).



Description

[0001] The present invention relates to an air heating passage having a good heat insulation effect, and a fabric drying apparatus having the same. The present invention is further directed to a fabric drying apparatus having an air heating passage with good heat insulation performance.

[0002] A common one among various fabric drying apparatus includes an air heating passage, which heats air and then delivers the heated air into a drum for containing fabric connected thereto. The heated air contacts wet fabric in the drum and takes away partial moisture, and enters a condensation device connected to the drum also. The moisture in the air in the condensation device is separated from the air. The air with the moisture separated reenters the air heating passage driven by a fan, so the fabric in the drum is gradually dried through the repeated circulation.

[0003] The air heating passage generally includes a passage allowing air to flow through and a heating device installed in the passage for heating the air passing through the passage. Presently, the passage wall of the air heating passage is generally made of a common metal material, so as to meet the requirements of strength and heat resistance. However, the heat resistance of the passage is poor, and most of the heat generated by the heating device is conducted to the air outside the passage through the wall of the passage, so that the heat is lost and the air heating efficiency is reduced, thereby resulting in energy waste and influencing the drying efficiency.

[0004] In view of the problem in heat insulation of the air heating passage, the present invention is directed to an improved air heating passage and to a fabric drying apparatus including such air heating passage, so as to achieve a good heat insulating effect.

[0005] The solutions to these problems is provided, in accordance with the invention, by an air heating passage and a fabric drying apparatus as defined in the respective independent claim attached. Preferred embodiments of the invention are defined in dependent claims as attached, with preferred embodiments of the air heating passage corresponding to preferred embodiments of the fabric drying apparatus, and vice versa, even if not indicated expressly herein.

[0006] In order to achieve the above objective, an air heating passage is provided according to the invention, which air heating passage includes a passage allowing air to flow through and a heating device installed in the passage for heating the air passing through the passage, and at least one part of the passage is made of a foam material.

[0007] In accordance with the invention, the foam material has the advantages such as high hardness, light weight, and good sound and heat insulation. The passage made of the foam material can reduce the heat loss, and at the same time can reduce the total weight of the air heating passage and the noise in use.

[0008] In order to achieve the above objective, a fabric drying apparatus according to the invention includes a rotatable drum for accommodating fabrics and an air heating passage for heating air and sending the heated air into the drum, in which the air heating passage includes a passage allowing air to flow through and a heating device installed in the passage for heating the air passing through the passage, and at least one part of the passage is made of a foam material.

[0009] The passage made of the foam material can reduce the heat loss, improve the drying efficiency of the apparatus, and at the same time, has the advantages of light weight and sound resistance and noise reduction.

[0010] In accordance with a preferred embodiment of the invention, the foam material is capable of withstanding a temperature of at least 200 °C.

[0011] In accordance with another preferred embodiment of the invention, the foam material is a foam alloy material. Particularly preferred, the foam alloy material may comprise an alloy having aluminium as a base metal.

[0012] The present invention will become more fully understood from the detailed description given herein below for illustration only, and thus are not limitative of the present invention, and wherein:

FIG. 1 is a schematic view of a fabric drying apparatus; and

FIG. 2 is an exploded view of an air heating passage.

[0013] As shown in FIG. 1, a fabric drying apparatus 10 includes a drum 4 and an external cylinder 6, in which the drum 4 is disposed in a cabinet 2 and is used for accommodating fabrics to be dried, and can be driven by a motor 3 to rotate, and the external cylinder 6 is used for accommodating the drum 4. The drum 4 has a great amount of through holes 14 distributed thereon, so as to be in communication with the external cylinder 6 in the space. The external cylinder 6 is connected to a condensing device 8, a blowing device 12, and an air heating passage 20 in sequence, and an outlet end 16 of the air heating passage 20 is connected to the external cylinder 6, thereby forming an air circulation cycle.

[0014] In the process of drying fabrics with the fabric drying apparatus 10, the air heating passage 20 heats the air and sends the heated air into the external cylinder 6 and the drum 4. The hot air takes away a part of the moisture after contacting the wet fabrics in the drum 4, and then enters the condensing device 6 through the external cylinder 6. In the condensing device 8, the moisture in the air is isolated from the air, and the air with the moisture removed is driven by the blowing device 12 and enters the air heating passage 20 again to begin a next cycle, so that the fabrics in the drum 4 are gradually dried.

[0015] Referring to FIG. 2 further, the air heating passage 20 includes a passage 22 allowing air to flow through and a heating device 24 installed in the passage 22 for heating air passing through the passage 22. The

passage 22 includes a base 26 and a cover 28 in abutting joint. The base 26 and the cover 28 of the passage 22 are made of a foam aluminum alloy. In addition to the inherent properties of aluminum alloy, the foam aluminum alloy material further has various excellent performances such as high mechanical strength, sound insulation, heat insulation, and light weight. The passage 22 made of the foam aluminum alloy also has the excellent performances, and especially can achieve a good heat insulation effect.

[0016] As foam materials generally have the advantages such as sound insulation, heat insulation, and light weight, except for the foam aluminum alloy described above, other foam materials can also be selected to fabricate the passage 22. In consideration of the special requirements of the work environment of the passage 22, the selected foam material must have high a heat resistance performance, and at the same time good mechanical strength and high hardness. Specifically, the selected foam material optimally can withstand a temperature of at least 200 degrees. Foam alloy materials are optimal materials. Definitely, other foam materials such as metal or non-metal foam materials can also be used.

[0017] In a broad sense, considering that the foam material has various excellent performances such as high mechanical strength, sound insulation, heat insulation, light weight, electromagnetic shielding, shock absorption, suitable foam materials can also be selected for being applied to the fabric drying apparatus, even to other components of other home appliances, for example, a belt pulley, a motor housing, and a fan cover.

[0018] The specific implementations described above with reference to the accompanying drawings are merely used to illustrate the present invention, but not intended to limit the present invention. Within the scope of the basic technical spirit of the present invention, various modifications of the present invention made by persons of ordinary skill in the art still fall within the protection scope of the present invention.

Claims

1. An air heating passage (20), comprising a passage (22) allowing air to flow through and a heating device (24) installed in the passage (22) for heating the air passing through the passage (22), **characterized in that**, at least one part of the passage (22) is made of a foam material.
2. The air heating passage (20) according to claim 1, **characterized in that**, the foam material is capable of withstanding a temperature of at least 200 °C.
3. The air heating passage (20) according to claim 1, **characterized in that**, the foam material is a foam alloy material.

4. A fabric drying apparatus (10), comprising a rotatable drum (4) for accommodating fabrics, an air heating passage (20) for heating air and sending the heated air into the drum (4), wherein the air heating passage (20) comprises a passage (22) allowing air to flow through and a heating device (24) installed in the passage (22) for heating the air passing through the passage (22), **characterized in that**, at least one part of the passage (22) is made of a foam material.
5. The fabric drying apparatus (10) according to claim 4, **characterized in that**, the foam material is capable of withstanding a temperature of at least 200 degrees.
6. The fabric drying apparatus (10) according to claim 4, **characterized in that**, the foam material is a foam alloy material.

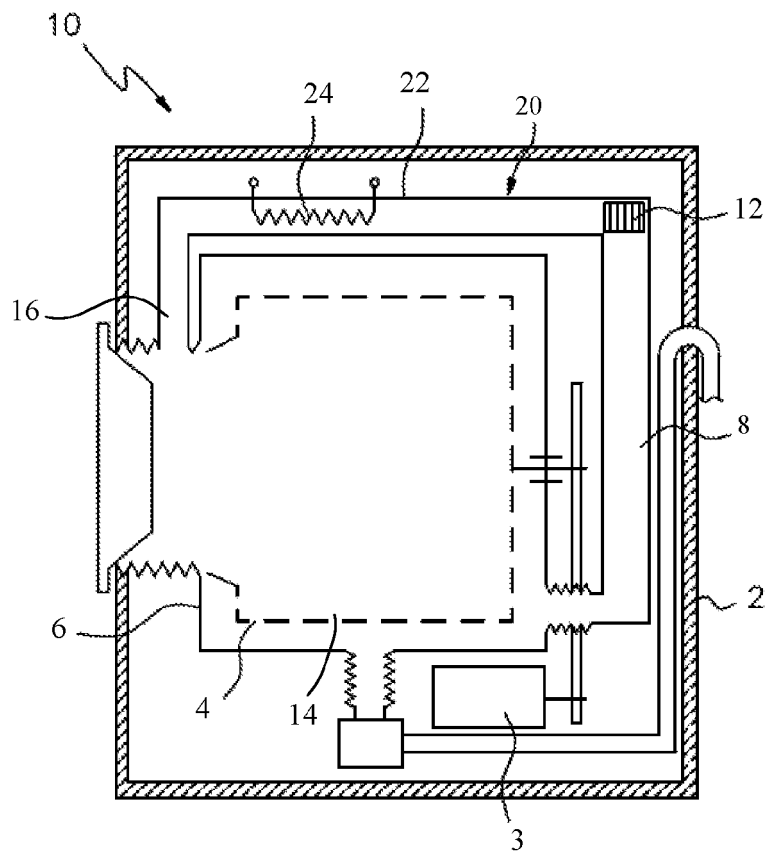


FIG. 1

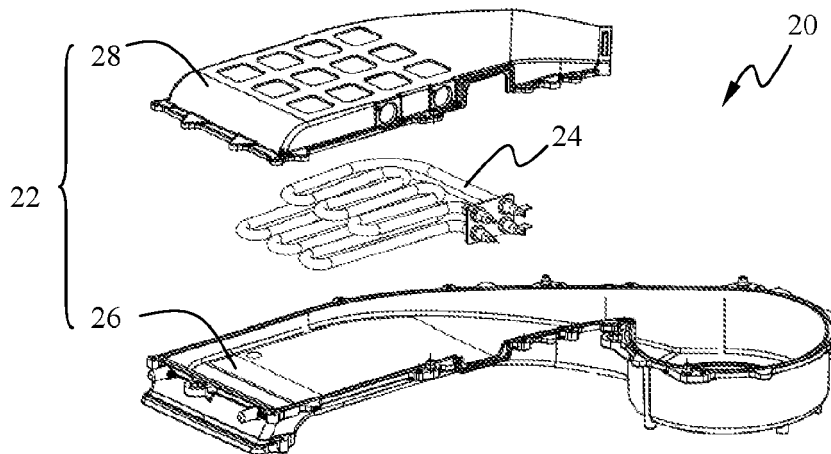


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 8053

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 Munich		Date of completion of the search 18 October 2011	Examiner Clivio, Eugenio
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	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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18-10-2011

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