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(54) **A COOLING DEVICE COMPRISING A CARRIER**

KÜHLVORRICHTUNG MIT EINEM TRÄGER

DISPOSITIF DE REFROIDISSEMENT COMPRENANT UN SUPPORT

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(56) References cited:

WO-A2-2013/038003

CN-Y- 2 676 114

DE-A1-102008 044 215

DE-A1-102012 012 574

DE-U1- 20 317 802

FR-A1- 2 550 851

JP-A- 2003 075 057

JP-B2- 5 197 209

US-A- 5 544 495

US-A1- 2006 188 705

US-B1- 6 536 227

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Description

[0001] The present invention relates to a cooling device comprising a carrier that is disposed on the body and that carries the components of the cooling system.

[0002] In cooling devices, especially in refrigerators and freezers, an insulation material is filled between the inner and outer walls of the body in order to provide heat insulation between the inner volume and the outer environment. The cooling system components and cable groups provided in cooling devices are generally placed onto the inner wall. The cooling system components and cable groups that are not fixed onto the inner wall contact with the outer wall. The cooling system components with surface temperatures lower than the surface temperature of the outer wall cause condensation on the outer wall. Moreover, when the cooling system components and cable groups are not fixed onto the outer wall, the insulation material filled in between the inner wall and the outer wall in order to provide thermal insulation between the inner volume and the outer environment cannot be homogeneously distributed.

[0003] In the state of the art Japanese Patent Application No. JPH09303947, a cooling device is disclosed, wherein the insulation material is enabled to be homogeneously distributed by means of the plates placed to the inner side of the inner wall of the body, contacting the insulation material. In this embodiment, a solidified epoxy layer and an intermediary resin layer are disposed between the inner wall and the insulation material.

[0004] Japanese Patent Application No. JP2003075057A discloses a refrigerator in which pipes are secured to a wall by adhesive tape or by spacers surrounding them radially.

[0005] The aim of the present invention is the realization of a cooling device comprising a carrier that carries the components of the cooling system and the cable groups on the body.

[0006] The cooling device realized in order to attain the aim of the present invention, defined in the first claim comprises a body having an insulation volume that is situated between the inner wall and the outer wall thereof and wherein an insulation material is filled.

[0007] The cooling device of the present invention comprises a carrier that covers the cooling system components hung thereon and placed on the inner wall, such as electronic components, the refrigerant pipe and the cables, thus preventing them from contacting with the outer wall. By means of the carrier, the cooling system components are disposed into the body without contacting with the outer wall. The carrier forms a smooth surface over the cooling system components and enables the insulation material to be homogeneously dispersed between the inner wall and the outer wall.

[0008] According to the present invention, the carrier is in the form of a net and produced from elastic material. Thus, the insulation material injected into the insulation volume through an opening arranged on the outer wall

splits into smaller pieces by filling into the recesses on the surface of the carrier by means of the net-shaped structure of the carrier and thus the number of air gaps occurring during the solidification of the insulation material is decreased. By means of this embodiment, formation of collapses on the inner wall surface facing the inner volume of the cooling device is prevented. Moreover, since the carrier takes the shape of the cooling system components whereon the carrier is placed thanks to its elastic structure, the cooling system components are easily hung onto the carrier.

[0009] In an embodiment of the present invention, the carrier comprises at least one cell that at least partially surrounds the cooling system components that are placed thereon. The cooling system components are hung onto the carrier by being placed into pocket-shaped cells. Thus, the cooling system components concealed in the cells are prevented from blocking the flow of the insulation material.

[0010] According to the present invention, the cooling device comprises two opposite side walls that form the body and the carrier is attached onto the side walls. The carrier is attached to the side walls from its opposite edges, thus preventing the movement of the cooling system components situated thereunder.

[0011] By means of the carrier of the present invention, the cooling system components are prevented from contacting with the outer wall and causing the formation of condensation thereon. Forming a smooth surface over the cooling system components, the carrier prevents the formation of air gaps in the solidified insulation material and gap-induced collapses on the surface of the inner wall.

[0012] The cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the schematic view of a cooling device.
Figure 2 - is the perspective view of a cooling device.
Figure 3 - is the partial perspective view of the body and the cooling components before the insulation material is pumped between the inner wall and the outer wall.

[0013] The elements illustrated in the figure are numbered as follows:

1. Cooling device
2. Inner wall
3. Outer wall
4. Insulation volume
5. Insulation material
6. Body
7. Carrier
8. Cell (not shown in the figures)
9. Side wall

[0014] The cooling device (1) comprises a body (6)

having an inner wall (2), an outer wall (3), an insulation volume (4) between the inner wall (2) and the outer wall (3) and an insulation material (5) filled into the insulation volume (4). While the inner wall (2) and the outer wall (3) are being joined during the production of the body (6), an opening is left so that the insulation material (5) can be filled into the insulation volume (4). The insulation material (5) filled preferably through this opening reaches almost every section of the insulation volume (4) thanks to its fluid structure. When filled into the insulation volume (4), the insulation material (5) composed of more than one chemical substance enters into exothermic reaction, expands and solidifies. Thus, the interior volume of the cooling device (1) is enabled to be insulated from the outer environment conditions and the durability of the body (6) is increased.

[0015] The cooling device (1) of the present invention comprises a carrier (7) that is disposed between the inner wall (2) and the outer wall (3), whereon the cooling system components (E) are hung. The carrier (7) physically separates the cooling system components (E) from the outer wall (3) and serves as a separator between the outer wall (3) and the cooling system components (E). By means of the carrier (7), the cooling system components (E) can be fixed onto the inner wall (2) without requiring any additional fixing means.

[0016] According to the present invention, the carrier (7) remains between the outer wall (3) and the cooling system components (E) and prevents the cooling system components (E) from contacting with the outer wall (3). Thus, formation of condensation on the surface of the outer wall (3) due to the fact that the surface temperature of the cooling system components (E) is lower than the surface of the outer wall (3) is prevented, thus providing user satisfaction.

[0017] According to the present invention, the carrier (7) is in the form of a net produced from elastic material. The insulation material (5) flows into the insulation volume (4) by being separated into little partitions due to the uneven and porous structure of the carrier (7). Thus, the number of gaps forming during the solidification is minimized and the inner wall (2) is prevented from collapsing towards the outer wall (3). This provides the malfunction-occurrence rate to decrease and the quality perception to increase. By means of the net-shaped carrier (7), the insulation material (5) is coated onto the inner wall (2) surface as small pieces, thus preventing any roughness on the inner wall (2) surface. By creating a smooth surface over the cooling system components (E) that the carrier (7) encloses like a cover, the carrier (7) enables the insulation material (5) to be homogeneously dispersed in the body (6).

[0018] In an embodiment of the present invention, the carrier (7) comprises at least one cell that at least partially surrounds the cooling system components (E) that are placed thereon. The cooling system components (E) are hung onto the carrier (7) by being placed into cells with forms matching those of the cooling system components

(E). Thus, the cooling system components (E) surrounded by the cell are prevented from blocking the flow of the insulation material (5) due to the recesses and/or projections on the cooling system components (E).

[0019] According to the present invention, the cooling device (1) comprises two opposite side walls that form the body (6) and the carrier (7) is attached onto at least one of the side walls. The carrier (7) is stretched by being attached to the side walls and covers the cooling system components (E). Thus, the cooling system components (E) are easily fixed onto the inner wall (2) surface and a rigid structure is obtained.

[0020] By means of the present invention, the cooling system components (E) can be fixed onto the inner wall (2) surface facing the outer wall (3) by being hung onto the carrier (7) without requiring any additional fixing means. Thus, the carrier (7) creates a barrier between the cooling system components (E) and the outer wall (3) and prevents the formation of condensation on the outer wall (3) surface. By means of uneven surface of the carrier (7) contacting with the insulation material (5), the flow of the insulation material (5) over the inner wall (2) is slowed. Thus, the inner wall (2) is prevented from collapsing towards the outer wall (3) due to gaps that may form because of rapid curing of the insulation material (5). Accordingly, the esthetic appearance of the cooling device (1) is improved and the strength of the body (6) is increased.

Claims

1. A cooling device (1) comprising a body (6) having an inner wall (2), an outer wall (3) and two opposite side walls that form the body (6), an insulation volume (4) between the inner wall (2) and the outer wall (3) and an insulation material (5) filled into the insulation volume (4), further comprising a carrier (7) that is disposed between the inner wall (2) and the outer wall (3), whereon cooling system components (E) are hung, wherein the carrier (7) is produced from elastic material and prevents the cooling system components (E) from contacting the outer wall **characterized** in that the carrier (7) is stretched by being attached to the side walls and covers the cooling system components (E), said carrier (7) is net-shaped.
2. A cooling device (1) as in Claim 1, **characterized by** the carrier (7) comprising at least one pocket-shaped cell that at least partially surrounds the cooling system components (E) disposed thereon.

Patentansprüche

1. Ein Kühlgerät (1) umfasst einen Körper (6) mit einer Innenwand (2), einer Außenwand (3) und zwei par-

allel liegenden Seitenwänden (9), die den Körper (6) bilden, ein Isolationsvolumen (4) zwischen der Innenwand (2) und der Außenwand (3) und ein Isolationsmaterial (5), dass in das Isolationsvolumen (4) eingefüllt ist, darüber hinaus umfasst er einen Träger (7), der zwischen der Innenwand (2) und der Außenwand (3) angeordnet ist, worauf die Kühlsystemkomponenten (E) aufgehängt sind, wobei der Träger (7) aus elastischem Material hergestellt ist und verhindert, dass die Kühlsystemkomponenten (E) die Außenwand berühren,

gekennzeichnet ist es dadurch,

- dass der Träger (7) durch Anbringen an den Seitenwänden (9) gespannt wird und die Kühlsystemkomponenten (E) bedeckt, wobei der Träger (7) netzförmig ist.

2. Ein Kühlgerät (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der Träger (7) mindestens eine taschenförmige Zelle umfasst, die die darauf angeordneten Kühlsystemkomponenten (E) mindestens teilweise umgibt.

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Revendications

1. Un dispositif de refroidissement (1) comprenant un corps (6) ayant une paroi intérieure (2), une paroi extérieure (3) et deux parois latérales opposées (9) qui forment le corps (6), un volume d'isolation (4) entre la paroi intérieure (2) et la paroi extérieure (3) et un matériau d'isolation (5) rempli dans le volume d'isolation (4), comprenant en outre un support (7) qui est disposé entre la paroi intérieure (2) et la paroi extérieure (3), sur lequel sont accrochés des composants du système de refroidissement (E), dans lequel le support (7) est fabriqué en matériau élastique et empêche les composants du système de refroidissement (E) d'entrer en contact avec la paroi extérieure

est caractérisé en ce que

- le support (7) est étiré en étant fixé aux parois latérales (9) et recouvre les composants du système de refroidissement (E), ledit support (7) est en forme de filet

2. Un dispositif de refroidissement (1) comme dans la déclaration 1, **est caractérisé en ce que** le support (7) comprend au moins une cellule en forme de poche qui entoure au moins partiellement les composants du système de refroidissement (E) disposés sur celui-ci.

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Figure 1

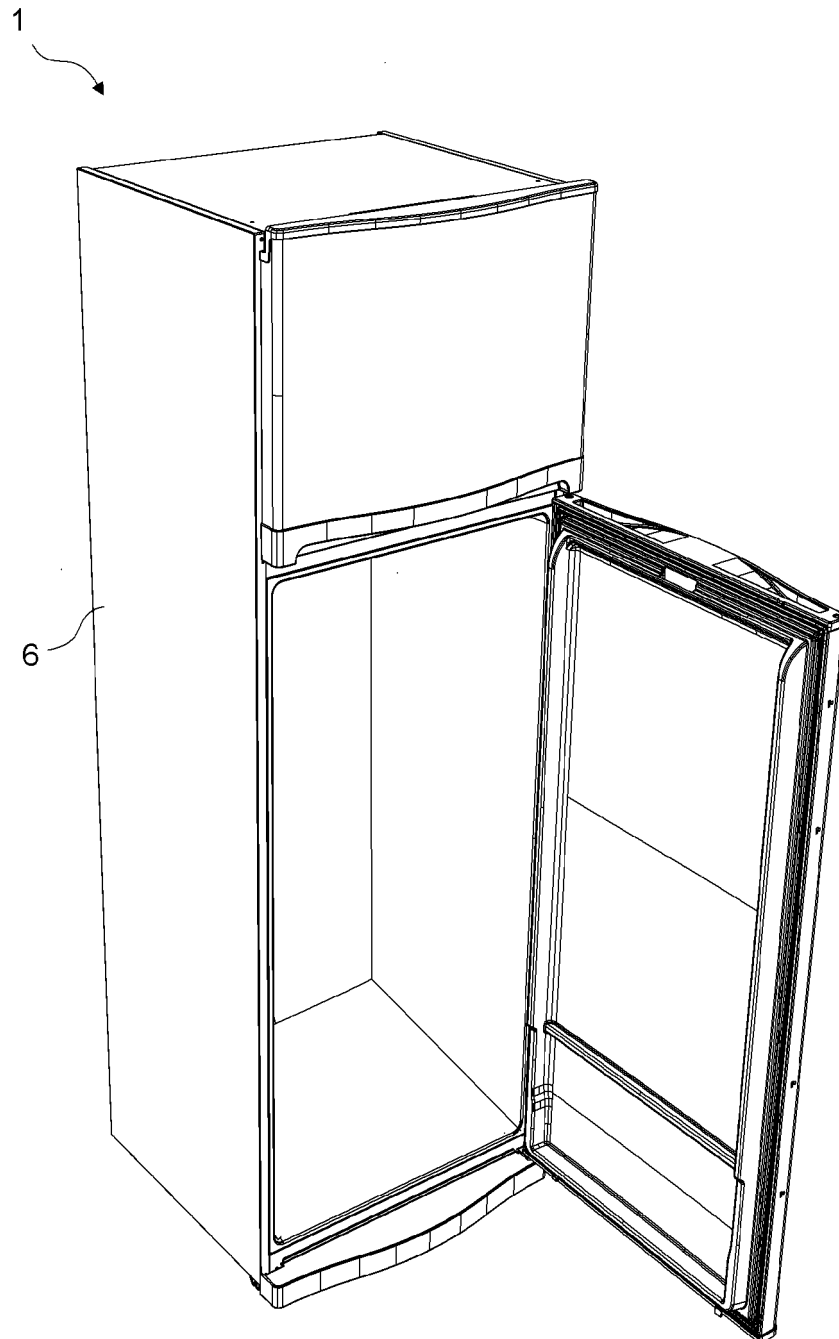


Figure 2

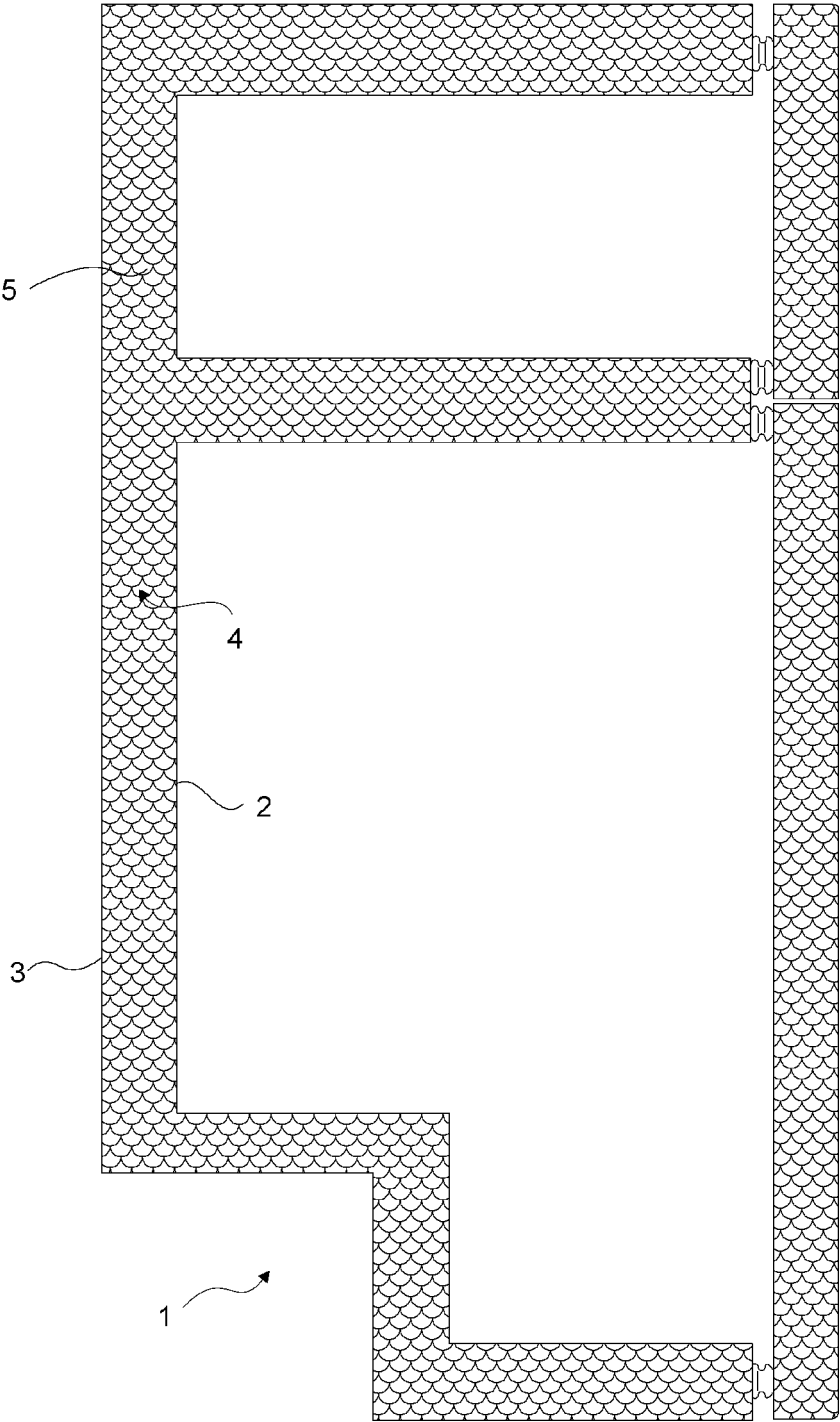
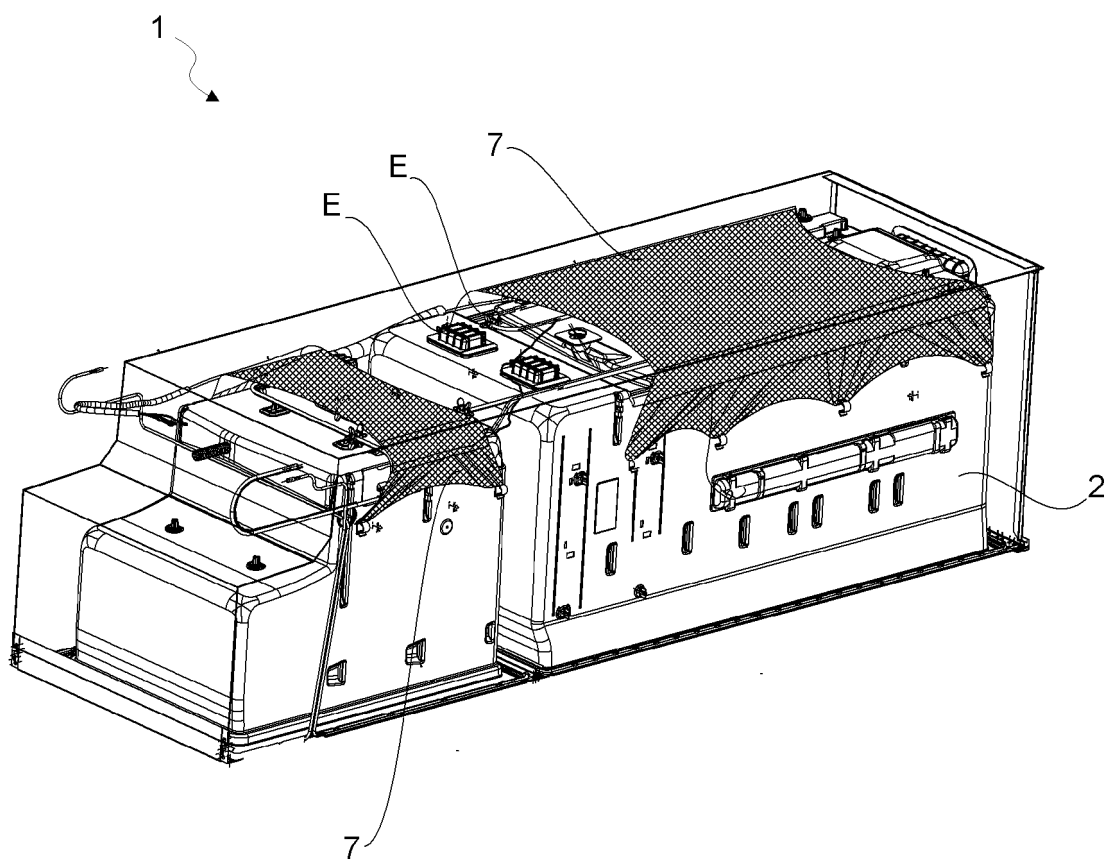


Figure 3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP H09303947 B [0003]
- JP 2003075057 A [0004]