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(54) **Domestic refrigerator**

Haushaltkühlschrank

Réfrigérateur ménager

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(73) Proprietor: **WHIRLPOOL CORPORATION**
Benton Harbor Michigan 49022 (US)

(72) Inventors:
- **Beati, Sergio Whirlpool Europe s.r.l., Pat. Dept. 21025 Comerio (IT)**
- **Sessa, Luigi Whirlpool Europe s.r.l., Pat. Dept. 21025 Comerio (IT)**

(74) Representative: **Guerci, Alessandro**
Whirlpool Europe S.r.l.
Patent Department
Viale G. Borghi 27
21025 Comerio (VA) (IT)

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Description

[0001] The present invention relates to a refrigerator, particularly a domestic refrigerator, of the type specified in the preamble of appended claim 1. The term refrigerator compartment refers here to a compartment intended for the preservation of foodstuffs at a temperature not below 0°C, while freezer compartment means a compartment in which the temperature is kept below 0°C.

[0002] Modern domestic refrigerators preferably use evaporators of what is known as embedded type, i.e. arranged in contact with the outer surface of the liner of the refrigerator compartment and the freezer compartment and encased in the thermally insulating material that envelopes the compartments. In such refrigerators the water vapour present in the refrigerator compartment tends to condense on all the cold walls in ratio to the prevailing thermal gradient. This has the consequence of unwanted condensation of the vapour, not only on the wall or walls next to which that portion of the embedded evaporator that is associated with the refrigerator compartment is usually arranged, but also on other internal walls of the refrigerator compartment. This problem is observed particularly in refrigerators that have a freezer compartment arranged above a refrigerator compartment. In fact, for such refrigerators the insulated space interposed between the freezer compartment and the refrigerator compartment is not always sufficient to ensure that the upper wall or ceiling of the refrigerator compartment is not at a lower temperature than the other walls of the compartment. This is unsatisfactory for the customer. because when condensation occurs on the upper wall or ceiling of the compartment, dripping can be observed, which affects products arranged on the refrigerator shelves, with obvious consequences in terms of presentation and preservation of the products themselves.

[0003] US-A-2 390 808 discloses a refrigerator of the type specified in the preamble of claim 1, in which the upper wall of the refrigeration compartment is constructed of sheet metal.

[0004] The object of the present invention is to obviate said drawbacks, in a simple and economic manner. According to the invention, this object is achieved according to the features of the characterizing portion of claim 1.

[0005] Thanks to the temperature of the capillary, placed between the condenser and the evaporator, which is higher than the temperature of the refrigerator compartment, a physical condition of the wall is produced, in correspondence with the ceiling of the compartment, that prevents the phenomenon of condensation, with possible dripping, on said ceiling.

[0006] Other advantages and characteristics of a refrigerator according to the invention will become obvious from the following detailed description, provided purely as a non-exhaustive example, with reference to the attached drawings in which:

- Figure 1 is a diagrammatic view in cross section of a refrigerator according to the invention, and
- Figure 2 is a diagrammatic perspective view from behind of a refrigerator compartment liner as used in the refrigerator in Figure 1.

[0007] With reference to the drawings, the reference number 10 illustrates a domestic refrigerator, as a whole, provided with a refrigerator compartment 10a and a freezer compartment 10b placed above the refrigerator compartment 10a. The refrigerator compartment 10a is closed off by a liner 12 made of plastic material produced, for example, by thermoforming, and by a door D. Between said liner and the outer walls of the refrigerator there is interposed an insulating material 14, for example polyurethane foam.

[0008] The coolant circuit comprises a compressor C, connected to a condenser N placed next to a rear wall of the refrigerator, said condenser being connected, in turn, via a capillary tube 16, to an evaporator E having a first portion E' associated with the freezer compartment 10b and a second portion E" arranged in contact with a vertical outer surface 12a of the liner 12. The capillary tube is arranged in contact with a horizontal outer surface 12b of the liner 12, in correspondence with the ceiling of the refrigerator compartment 10a. To make the capillary tube 16 integral with the surface 12b of the upper wall of the compartment, an adhesive tape (not illustrated) is used, preferably made of aluminium. The capillary 16 is also covered with a sheet of aluminium 18 made adhesive, to distribute uniformly the heat given off by the capillary.

[0009] Naturally, it is intended that the effects of the present invention extend to models that achieve the same benefits, exploiting the same innovative concept. For example, the solution according to the invention can be used in refrigerators of a type different from that described and illustrated, for example, refrigerators provided with two separate evaporators associated with their own independent coolant circuits (two-compressor refrigerator), or in refrigerators provided with a freezer compartment inside the refrigerator compartment itself (single-door refrigerators), said refrigerators having technical characteristics equivalent to the space between refrigerator compartment and freezer compartment similar to those present in a double-door refrigerator, of the type illustrated in the drawings.

Claims

1. Refrigerator, comprising a refrigerator compartment (10a) placed below a freezer compartment (10b) and a coolant circuit provided with a capillary tube (16) interposed between a condenser (N) and an evaporator (E), at least one portion of the capil-

lary tube (16) being thermally associated with an upper wall (12b) of the refrigerator compartment, **characterised in that** the refrigerator comprises a liner (12) made of polymeric material defining the cavity of the refrigerator compartment, and **in that** said capillary tube (16) is placed immediately downstream the condenser (N) and it is placed in contact with an outer surface (12b) of said liner (12), associated with the upper wall of the refrigerator compartment (10a).

2. Refrigerator according to Claim 1, **characterised in that** said capillary tube (16) is interposed between said outer surface (12b) and a sheet of metal (18) capable of making the temperature of the upper wall of the compartment more uniform.

3. Refrigerator according to Claim 2, **characterised in that** at least one portion (E") of the evaporator (E) is arranged in contact with an outer surface (12a) of the liner, associated with a rear vertical wall of the refrigerator compartment (10a).

Patentansprüche

1. Kühlgerät mit einem Kühlfach (10a), einem unter diesem angeordneten Gefrierfach (10b) und einem Kühlkreislauf, der mit einem zwischen einem Kondensator (N) und einem Verdampfer (E) angeordneten Kapillarrohr (16) versehen ist, wobei mindestens ein Teil des Kapillarrohrs wärmemäßig mit einer oberen Wand (12b) des Kühlfachs verbunden ist,
dadurch gekennzeichnet,
dass das Kühlgerät eine die Kammer des Kühlfachs bestimmende Verkleidung (12) aus Polymermaterial aufweist und dass das Kapillarrohr (16) in Arbeitsrichtung unmittelbar hinter dem Kondensator (N) und in Kontakt mit einer Außenfläche (12b) der Verkleidung (12) angeordnet ist, wobei diese Außenfläche mit der oberen Wand des Kühlfachs (10a) verbunden ist.

2. Kühlgerät nach Anspruch 1,
dadurch gekennzeichnet,
dass das Kapillarrohr (16) zwischen der genannten Außenfläche (12b) und einem Metallblech (18) angeordnet ist, das die Temperatur der oberen Wand des Kühlfachs gleichmäßiger verteilt.

3. Kühlgerät nach Anspruch 2,
dadurch gekennzeichnet,
dass mindestens ein Teil (E") des Verdampfers (E) in Kontakt mit einer Außenfläche (12a) der Verkleidung steht, die einer vertikalen Rückwand des Kühlfachs (10a) zugeordnet ist.

Revendications

1. Réfrigérateur, comportant un compartiment de réfrigérateur (10a) placé en dessous d'un compartiment de congélateur (10b) et un circuit de liquide réfrigérant pourvu d'un tube capillaire (16) interposé entre un condenseur (N) et un évaporateur (E), au moins une partie du tube capillaire (16) étant thermiquement associée à une paroi supérieure (12b) du compartiment de réfrigérateur, **caractérisé en ce que** le réfrigérateur comporte un revêtement (12) composé d'une matière polymère définissant la cavité du compartiment de réfrigérateur, et **en ce que** ledit tube capillaire (16) est placé immédiatement en aval du condenseur (N) et il est placé en contact avec une externe surface (12b) dudit revêtement (12), associé à la paroi supérieure du compartiment de réfrigérateur (10a).

2. Réfrigérateur la revendication 1, **caractérisé en ce que** ledit tube capillaire (16) est interposé entre ladite surface externe (12b) et une tôle (18) capable de rendre plus uniforme la température de la paroi supérieure du compartiment.

3. Réfrigérateur selon la revendication 2, **caractérisé en ce qu'**au moins une partie (E") de l'évaporateur (E) est prévue en contact avec une surface externe (12a) du revêtement, associée à une paroi verticale arrière du compartiment de réfrigérateur (10a).

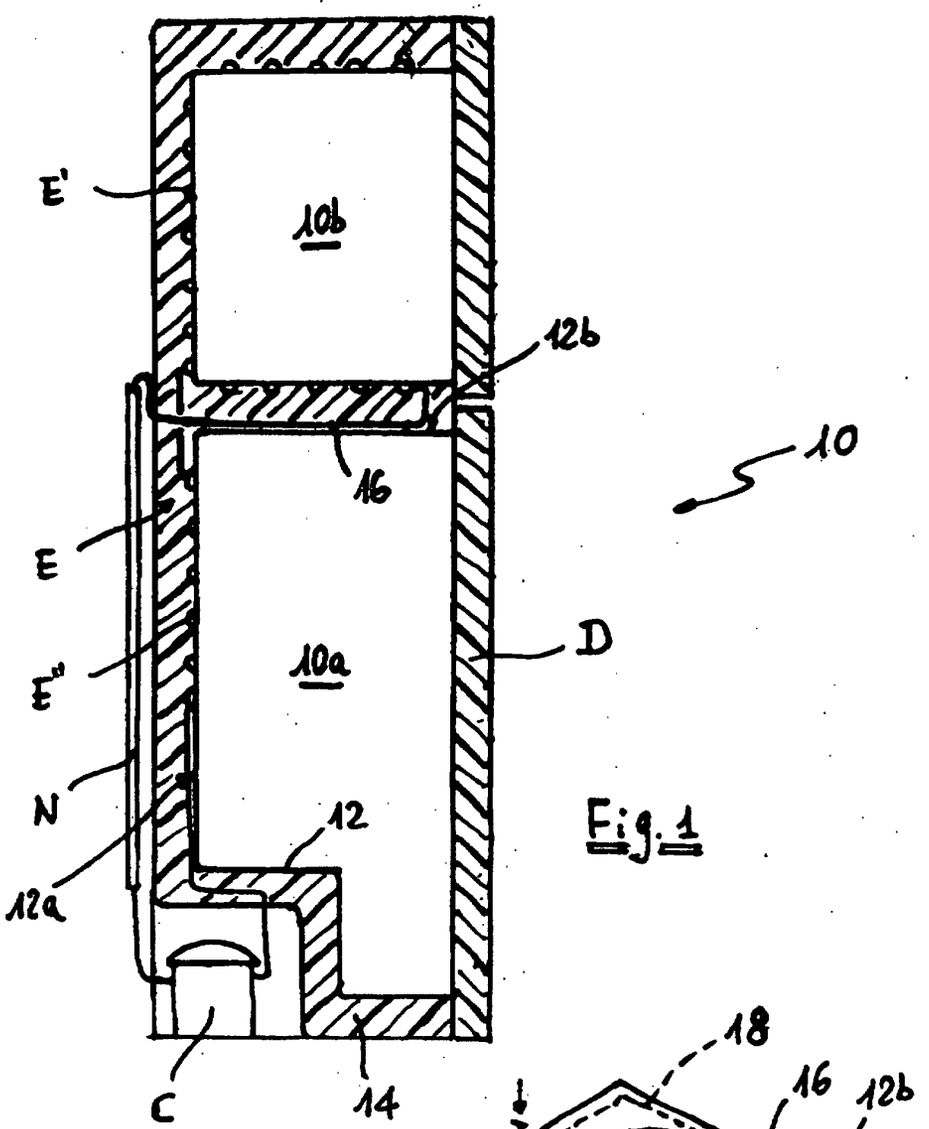


Fig. 1

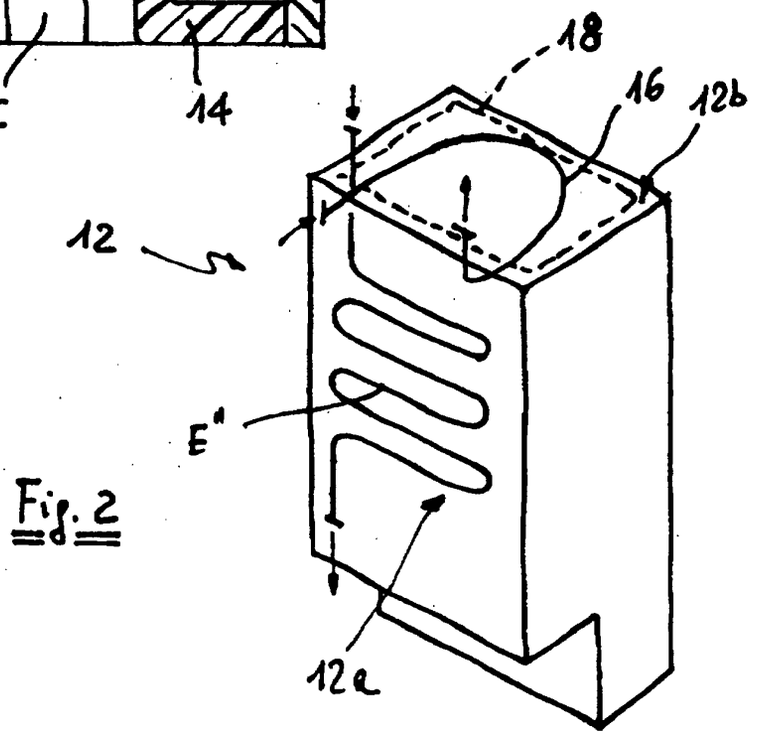


Fig. 2