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(54) **Refrigerator, such as fridge or freezer**

Kältegerät, wie Kühl- oder Gefrier-Schrank

Appareil frigorifique, tel que réfrigérateur ou congélateur

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## Description

[0001] The present invention concerns a refrigerator according to the preamble of claim 1.

## BACKGROUND TO THE INVENTION

[0002] It is known that refrigerator units and the like have a heat-insulating casing formed physically by a wall in which there is a layer of foam as heat insulator, an internal covering which faces the side of the refrigeration compartment, and an external covering.

[0003] It is also known that through the heat-insulating wall passes a breather tube coupled to the actual evaporator of the cold storage unit, to the outside.

[0004] Now, the water that is condensed in the breather tube mentioned can reach the external face, i.e. the external covering, water absorption occurring on the part of the latter due to capillary action, resulting in the corresponding water stain as well as the detachment of the layer forming this external covering with respect to the surface of the foam layer to which the external covering or layer is fixed.

[0005] On the other hand, in the injecting of the foam to form the heat-insulating wall, there usually occurs a penetration of said foam into the refrigeration compartment, exuding even to the outside through the surface of the external covering.

[0006] Although at the present time penetration ducts are employed through which the breather tube runs, and which are soldered to or mounted on the internal covering, also called container, there is no guarantee that escapes due to expansion do not occur, particularly into the inside of the refrigeration compartment.

[0007] The invention consists of a refrigerator having the technical features given in claim 1.

[0008] The second section can have an internal or external enclosing surface which narrows in a conical manner, and which can collaborate with a sealing effect with an internal or external enclosing surface narrowing equally in a conical manner in the indentation of the internal covering.

[0009] Preferentially, this second section is narrowed in a conical manner towards the intermediate partition that separates it from the first section, said second section conically narrowed towards the intermediate partition being coupled, with a sealing effect, with the narrowed indentation on its external enclosing surface and to be found on the side of the heat insulation.

[0010] The second section cited can have a series of channels arranged over its internal enclosing surface, in order to facilitate the expulsion of air when being coupled with the indentation of the internal covering.

[0011] Said indentation of the internal covering can have its free end implemented in a seal which can be perforated in order to permit the passage of the breather tube.

[0012] Regarding the first section of the penetration

duct, this can have an internal enclosing surface which is narrowed in conical manner from its free end towards the second section, such first section incorporating at its free end a surrounding lip which rests, with sealing effect, on the outside face of the external covering, away from the heat-insulating layer.

[0013] Preferentially, both the first section and the second section, and the actual indentation of the internal covering, have a cross section that is circular in outline.

[0014] A fundamental advantage of the refrigerator with the penetration duct described, in accordance with one of the preferred implementations, consists in that as a consequence of the seal that is determined by the intermediate partition which can be perforated and lies between the two sections of the penetration duct itself, it is impossible for the foam which is injected to form the heat-insulating layer of the casing to penetrate into the internal refrigeration compartment, preventing likewise that it can exude to the outside due to poor assembly of the duct.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0015] In order to complete the description that follows here below and for the purpose of assisting in a better understanding of the characteristics of the invention, this document is accompanied with a set of drawing on a basis of which descriptions are provided, without being limiting in nature, of some preferred embodiments of the penetration duct corresponding to the refrigerator of the invention.

**Figure 1.-** Shows a cross sectional view of the penetration duct which forms part of the refrigerator object of the invention, in a preferred embodiment, said duct being mounted in the corresponding orifice or passage made for the purpose in the heat-insulating wall of the casing of said refrigerator, capable of being constituted by a cold storage unit or the like.

**Figure 2.-** Shows another cross sectional view of the same penetration duct assembly but in this case in a variant of the embodiment in which the intermediate wall between the two sections of the penetration duct is shaped in the form of a truncated cone.

**Figure 3.-** Shows a top view of the penetration duct as illustrated in the previous figure.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Regarding figure 1, it can be seen that the penetration duct 1 is mounted in the feed-through corresponding to a heat-insulating wall of a refrigerator or cold storage unit, said wall being formed by a layer of foam 2, as the actual heat-insulating material, an external covering 3 and an internal covering 4, this latter delimiting the refrigeration compartment.

[0017] According to the object of the invention, the

penetration duct intended to house the respective breather tube, from the cold storage unit evaporator to the outside, has two clearly differentiated sections 5 and 7 separated from each other by means of an intermediate partition 6 which can be perforated or even removed.

[0018] The first section 5 has at its free end a surrounding lip 11 projecting outwards, constituting a support wall on the layer that forms the external covering 3, it being possible for said section 5 to be slightly in the form of a truncated cone decreasing in perimeter from the free end towards the intermediate partition 3.

[0019] For its part, the second section 7, which can also be in the form of a truncated cone, in one direction or the other, both internally and externally, has the particularity that internally it is provided with a segment 8 in the form of a truncated cone diverging towards the free end, into which is pressure-fitted a indentation 9 corresponding to the internal covering 4, said indentation 9 having at its innermost extremity a partition which can be perforated, conical in shape, capable of being removable.

[0020] In a preferred embodiment, shown in the figure 2, the intermediate partition 6' of the penetration duct has the shape of a truncated cone, closed and also able to be perforated or removed like the intermediate partition 6 of the embodiment shown in figure 1, the penetration duct being constituted in identical manner to that already indicated, i.e. with sections 5 and 7, the surrounding lip 11 of the first section 5 for support on the external covering 3, and section 7 pressure-fitted to the truncated cone indentation 9 of the internal covering 4. In this embodiment shown in figure 2, section 7 of the penetration duct 1 has a series of channels 12 on its inside surface in the direction of the generatrices, constituting vents through which air is expelled when pressure-fitting indentation 9 of the internal covering 4.

## Claims

**1. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, including a casing having a heat-insulating wall with an internal covering (4), a heat-insulating layer (2) and an external covering (3), the refrigerator having at least one storage space which is refrigerated by an evaporator, which is coupled to a breather tube led through the heat-insulating wall, from the storage space to the outside, the path followed by the breather tube being provided by a penetration duct and, the breather tube having a flexible insulating pipe, to prevent the wall of the casing from being covered with condensation or dew, **characterised in that** the penetration duct has a first section (5) for housing, at least in part, the flexible insulating pipe, and a second section (7) as a continuation of the first, which is coupled pressure-fitted onto an indentation (9) of the internal covering (4), and wherein the first (5)

and second (7) sections of the penetration duct are separated from each other by means of an intermediate partition (6) which can be perforated or removed, in order to permit the passage of the breather tube.

- 2. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1, **characterised in that** the second section (7) has an internal or external enclosing surface which narrows in a conical manner (8), to collaborate with a sealing effect on an internal or external enclosing surface equally narrowed in a conical manner on the indentation (9).
- 3. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claim 2, **characterised in that** the second section (7) has a conical form narrowing towards the intermediate partition (6 or 6') on its internal enclosing surface and is coupled with sealing effect onto the indentation (9) narrowed on its external enclosing surface, situated on the side of the heat insulation.
- 4. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1 to 3, **characterised in that** the second section (7) has channels (12) arranged along its internal enclosing surface, for the expulsion of air.
- 5. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1 or 4, **characterised in that** the indentation (9) has at its free end a sealing partition (10) where it is perforated.
- 6. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1 or 2, **characterised in that** the first section (5) has an internal enclosing surface which narrows in a conical manner from its free end towards the second section (7).
- 7. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1, 2 or 6, **characterised in that** the first section (5) has at its free end a surrounding lip (11) which forms a support wall with sealing effect on the outside face of the external covering (3), away from the layer of heat insulation.
- 8. REFRIGERATOR, SUCH AS COLD STORAGE UNIT OR FREEZER**, according to claims 1 to 7, **characterised in that** the first section (5), the second section (7) and the indentation (9) are circular in cross section.

## Patentansprüche

1. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, umfassend ein Gehäuse mit einer Wärmedämmschicht (2) und eine Außenabdeckung (3) aufweist, wobei die Kältemaschine wenigstens einen Speicherraum aufweist, welcher durch einen Verdampfer gekühlt wird, der mit einem Entlüftungsrohr verbunden ist, welches vom Speicherraum durch die Wärmedämmschicht zur Außenseite geführt wird, wobei die Bahn, welche vom Entlüftungsrohr verfolgt wird, durch eine Penetrationsrohrleitung bereitgestellt wird und das Entlüftungsrohr einen Isolierschlauch aufweist, um zu verhindern, dass die Wand des Gehäuses mit Kondensation oder Tau bedeckt wird, **dadurch gekennzeichnet, dass** die Penetrationsrohrleitung einen ersten Abschnitt (5) zur wenigstens teilweisen Aufnahme des Isolierschlauchs und einen zweiten Abschnitt (7), welcher mit einer Einbuchtung (9) der Innenabdeckung (4) pressgepasst verbunden ist, als eine Fortsetzung des ersten aufweist, und wobei der erste (5) und der zweite (7) Abschnitt der Penetrationsrohrleitung durch eine Mitteltrennung (6), welche durchlocht oder weggelassen werden kann, um den Durchgang des Entlüftungsrohrs zu erlauben, voneinander getrennt sind.
2. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1, **dadurch gekennzeichnet, dass** der zweite Abschnitt (7) eine innere oder äußere Einfassungsfläche aufweist, welche sich auf eine kegelförmige Weise (8) verengt, um mit einer dichten Wirkung auf einer inneren oder äußeren Einfassungsfläche, welche sich gleichfalls auf eine kegelförmige Weise verengt, auf der Einbuchtung (9) zusammenzuwirken.
3. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 2, **dadurch gekennzeichnet, dass** der zweite Abschnitt (7) eine Kegelform aufweist, welche sich zur Mitteltrennung (6 oder 6') auf seiner inneren Einfassungsfläche verengt, und mit dichtender Wirkung mit der Einbuchtung (9) verbunden ist, welche sich an ihrer äußeren Einfassungsfläche verengt und auf der Seite der Wärmedämmung angeordnet ist.
4. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1 bis 3, **dadurch gekennzeichnet, dass** der zweite Abschnitt (7) Kanäle (12) aufweist, welche zum Ausstoßen von Luft entlang seiner inneren Einfassungsfläche angeordnet sind.

5. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1 bis 4, **dadurch gekennzeichnet, dass** die Einbuchtung (9) an ihrem freien Ende eine Dichtungstrennung (10) aufweist, wo sie durchlocht wird.
6. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der erste Abschnitt (5) eine innere Einfassungsfläche aufweist, welche sich von ihrem freien Ende zum zweiten Abschnitt (7) auf eine kegelförmige Weise verengt.
7. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1, 2 oder 6, **dadurch gekennzeichnet, dass** der erste Abschnitt (5) an seinem freien Ende eine Umschließungslippe (11) aufweist, welche eine Tragwand mit dichtender Wirkung auf der Außenfläche der Außenabdeckung (3) von der Wärmedämmschicht weg bildet.
8. Kältemaschine, wie beispielsweise eine Kältespeichereinheit oder ein Gefrierschrank, nach Anspruch 1 bis 7, **dadurch gekennzeichnet, dass** der erste Abschnitt (5), der zweite Abschnitt (7) und die Einbuchtung (9) einen kreisförmigen Querschnitt aufweisen.

## Revendications

1. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, comprenant une caisse possédant une paroi calorifuge comportant un revêtement interne (4), une couche calorifuge (2) et un revêtement externe (3), l'appareil frigorifique possédant au moins un espace d'entreposage qui est réfrigéré par un évaporateur, qui est couplé à un tube reniflard traversant la paroi calorifuge, depuis l'espace d'entreposage jusqu'à l'extérieur, le chemin suivi par le tube reniflard étant assuré par un conduit de pénétration, et le tube reniflard possédant un tuyau souple isolant, pour empêcher la paroi de la caisse d'être recouverte de condensation ou de rosée, **caractérisé en ce que** le conduit de pénétration possède une première section (5) pour loger, au moins en partie, le tuyau souple isolant, et une seconde partie (7) dans le prolongement de la première, qui est couplée par emboîtement par pression sur une échancrure (9) du revêtement interne (4), et dans lequel les première (5) et seconde (7) sections du conduit de pénétration sont séparées l'une de l'autre au moyen d'une paroi de séparation intermédiaire (6) pouvant être perforée ou re-

tirée, afin de permettre le passage du tube reniflard.

2. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon la revendication 1, **caractérisé en ce que** la seconde section (7) présente une surface enveloppante interne ou externe qui se rétrécit d'une manière conique (8), pour coopérer avec un effet d'étanchéité sur une surface enveloppante interne ou externe également rétrécie d'une manière conique sur l'échancrure (9). 5 10
3. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon la revendication 2, **caractérisé en ce que** la seconde section (7) présente une forme conique se rétrécissant vers la paroi de séparation intermédiaire (6 ou 6') sur sa surface enveloppante interne et est couplée avec un effet d'étanchéité sur l'échancrure (9) rétrécie sur sa surface enveloppante externe, située du côté de l'isolant thermique. 15 20
4. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon les revendications 1 à 3, **caractérisé en ce que** la seconde section (7) possède des gorges (12) disposées le long de sa surface enveloppante interne, pour l'expulsion de l'air. 25 30
5. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon les revendications 1 ou 4, **caractérisé en ce que** l'échancrure (9) possède à son extrémité libre une paroi de séparation étanche (10) où elle est perforée. 35
6. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon les revendications 1 ou 2, **caractérisé en ce que** la première section (5) présente une surface enveloppante interne qui se rétrécit de manière conique depuis son extrémité libre vers la seconde section (7). 40 45
7. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE OU UN CONGELATEUR**, selon les revendications 1, 2 ou 6, **caractérisé en ce que** la première section (5) possède à son extrémité libre une lèvre périphérique (11) qui forme une paroi de support avec un effet d'étanchéité sur la face extérieure du revêtement externe (3), à distance de la couche d'isolant thermique. 50 55
8. **APPAREIL FRIGORIFIQUE, TEL QU'UNE INSTALLATION D'ENTREPOSAGE FRIGORIFIQUE**

**OU UN CONGELATEUR**, selon les revendications 1 à 7, **caractérisé en ce que** la première section (5), la seconde section (7) et l'échancrure (9) ont une section transversale circulaire.

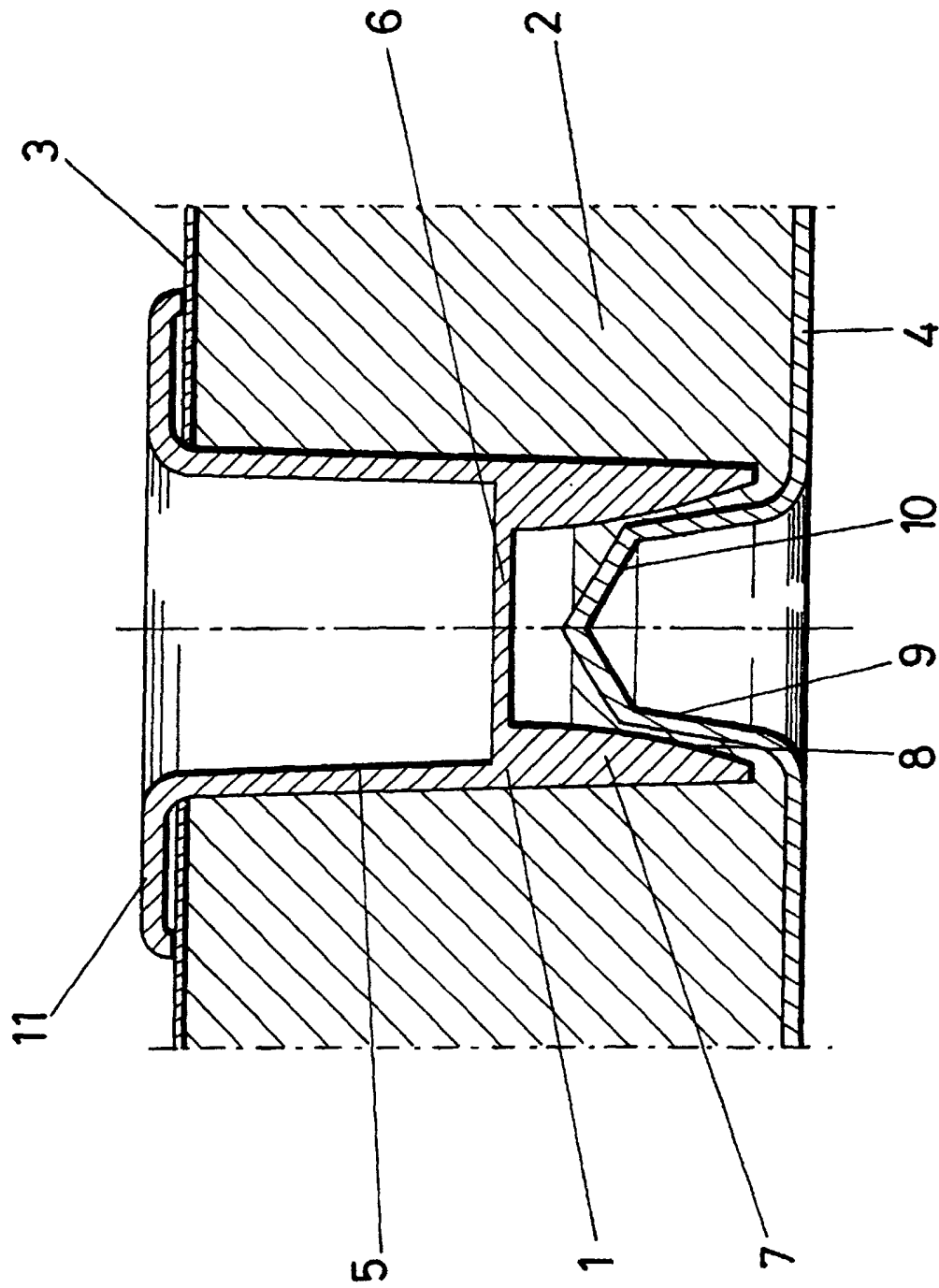


FIG.1

