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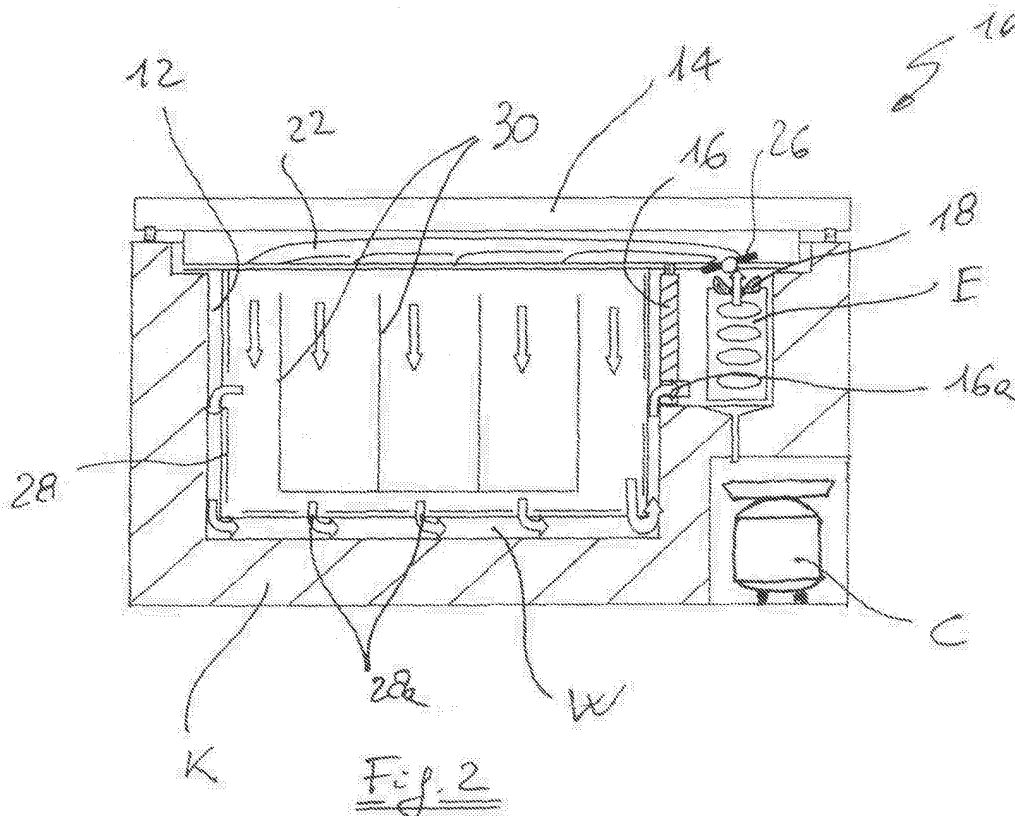
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(54) **No-frost Chest freezer**

(57) A "no-frost" chest freezer comprises a tank-like auxiliary element (28) equipped with a plurality of openings (28a) and capable of being introduced into the cabinet so as to form, together with the latter, a gap (W) for

air circulation. Said air circulation is controlled by a fan (18) arranged in a zone of the cavity which accommodates the evaporator (E) of the refrigeration circuit and is separated from the remainder of the cabinet by an insulated wall (16).



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Description

[0001] The present invention relates to a chest freezer of the type comprising a cabinet, an evaporator and ventilation means capable of causing a stream of air to circulate through said evaporator and said cabinet.

[0002] The above-stated chest or horizontal freezers of what is known as the "no-frost" type have the advantage relative to static freezers of not requiring periodic "manual" defrosting of the cabinet. Indeed, owing to a suitable electrical resistor, any frost or ice that builds up on the evaporator can be defrosted periodically without any intervention on the part of the user.

[0003] On the other hand, in comparison with static chest freezers where substantially the entire cabinet is surrounded by the evaporator, there remains the problem in no-frost chest freezers of effectively conveying the air from the evaporator to the cabinet and back again to the evaporator. Freezers have been produced with air ducts provided in the walls, at the expense of the structural simplicity of the household appliance.

[0004] The aim of the present invention is to provide a chest freezer of the above-stated type that resolves the problem of effectively circulating the air in a simple and economic manner.

[0005] According to the invention, said aim is achieved owing to the fact that the freezer comprises a tank-like auxiliary element equipped with a plurality of openings and capable of being introduced into the cabinet in order to form therewith a gap for air circulation. In this manner, the air from the cabinet is conveyed through said openings towards the gap and conveyed therefrom upstream of the evaporator. In this manner, excellent air flow and a substantially uniform temperature are obtained within the cabinet.

[0006] A further advantage of freezer according to the invention is the possibility of converting a static chest freezer simply and quickly into a no-frost-type chest freezer by simply introducing into the cabinet the tank-like auxiliary element together with the evaporator, damper and fan assembly.

[0007] Further advantages and characteristics of a freezer according to the invention will emerge from the following detailed description, provided purely by way of nonlimiting example, with reference to the attached drawings, in which:

- Figure 1 is a sectional diagrammatic view of a freezer according to the invention in a pre-assembly configuration; and
- Figure 2 is a view similar to Figure 1 showing the freezer in an operational configuration.

[0008] With reference to the drawings, 10 denotes overall a no-frost chest freezer having a cavity 12 and a horizontal door 14. The cavity 12 is defined by a wall or "liner" insulated from the surrounding environment by

means of an insulating material K. Within the cavity, there is defined a compartment 12a, which is arranged for example at the level of a step beneath which is accommodated a compressor C, and is separated from the remainder of the cavity by an insulated wall 16. This latter wall has at the bottom an opening 16a for the return air to pass through. The compartment 12a contains an evaporator E provided at the top with a fan 18 for air circulation. The fan 18 is configured such that flow is directed towards an opening 20 located in the door 14 and connected to internal ducts 22 in the door that open into corresponding vents 24. At the level of the opening 20, there is furthermore provided a valve or "damper" 26 capable of preventing the flow of air (even with the fan 18 stationary, and thus simply by convection) in a condition for defrosting the evaporator E. The damper 26 is associated with a sealing gasket, for example made of silicone rubber (not shown), capable of completely sealing any leaks of air from the compartment 12a. It is important for the vents 24 of the door 14 to be narrower in the vicinity of the evaporator E and for them to become gradually wider towards the opposite side. This is to ensure that cold air is also conveyed to the part of the freezer opposite that where the evaporator E is arranged and that the circulation of cold air is not restricted to the ducts closest to the evaporator.

[0009] A tank- or basket-like element 28 is introduced into the cavity 12, said element being of slightly smaller dimensions than the "liner" of said cavity and being equipped with a plurality of openings 28a for the air to pass through. The element 28 or the liner of the cavity 12 is provided with spacers (not shown) capable of ensuring a predetermined distance between the element 28 and the cavity 12 in such a manner as to define a gap W for circulation of the return air. Said circulation, shown by arrows in the drawings, ensures that the fan 18 directs cold air towards the ducts 22 of the door and thence, through the vents 24, directly into the cabinet where the products to be preserved are stacked. From the cabinet, the air passes through the openings 28a of the basket-like element 28 into the gap W whence it is drawn through the opening 16a in the insulated wall 16 towards the evaporator E.

[0010] According to one variant of the invention (not shown), instead of ducts within the door 14, it is possible to use doors of a conventional type provided with a "plenum" shaped so as to direct the cold air towards the cabinet.

[0011] Within the tank-like element 28 there are preferably arranged a plurality of baskets 30 for food products, said baskets also being capable of acting as spacers for better directing the streams of air towards the openings 28a.

Claims

1. Chest freezer, of the type comprising a cabinet, an

evaporator, ventilation means capable of causing a stream of air to circulate through said evaporator and said cabinet, **characterised in that** it comprises a tank-like auxiliary element (28) equipped with a plurality of openings (28a) and capable of being introduced into the cabinet (12) so as to form, together with the latter, a gap (W) for air circulation. 5

2. Freezer according to Claim 1, **characterised in that** said evaporator (E) is located in a zone of the cabinet (12a) that is separated from the remainder of the cabinet (12) by means of a thermally insulated wall (16), there being provided in said wall (16) at least one opening (16a) for the air to pass through. 10

3. Freezer according to Claim 2, **characterised in that** it comprises valve means (26) capable of preventing the circulation of air during defrosting of the evaporator (E). 15

4. Freezer according to any one of the preceding claims, **characterised in that** comprises a door (14) provided with internal ducts (22) for conveying the stream of air downstream from the evaporator (E) towards an upper zone of the cabinet (12), air being returned towards the evaporator (E) in said gap (W). 20 25

5. Freezer according to Claims 3 and 4, **characterised in that** the above-stated valve means (26) are associated with said ducts (20, 22) of the door (14). 30

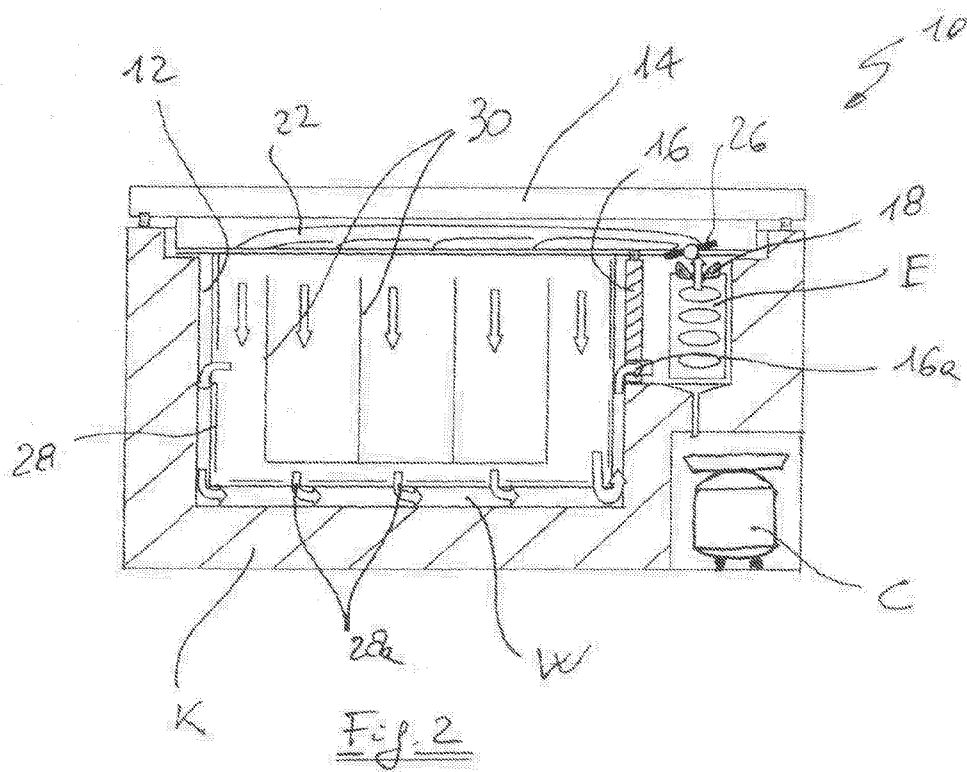
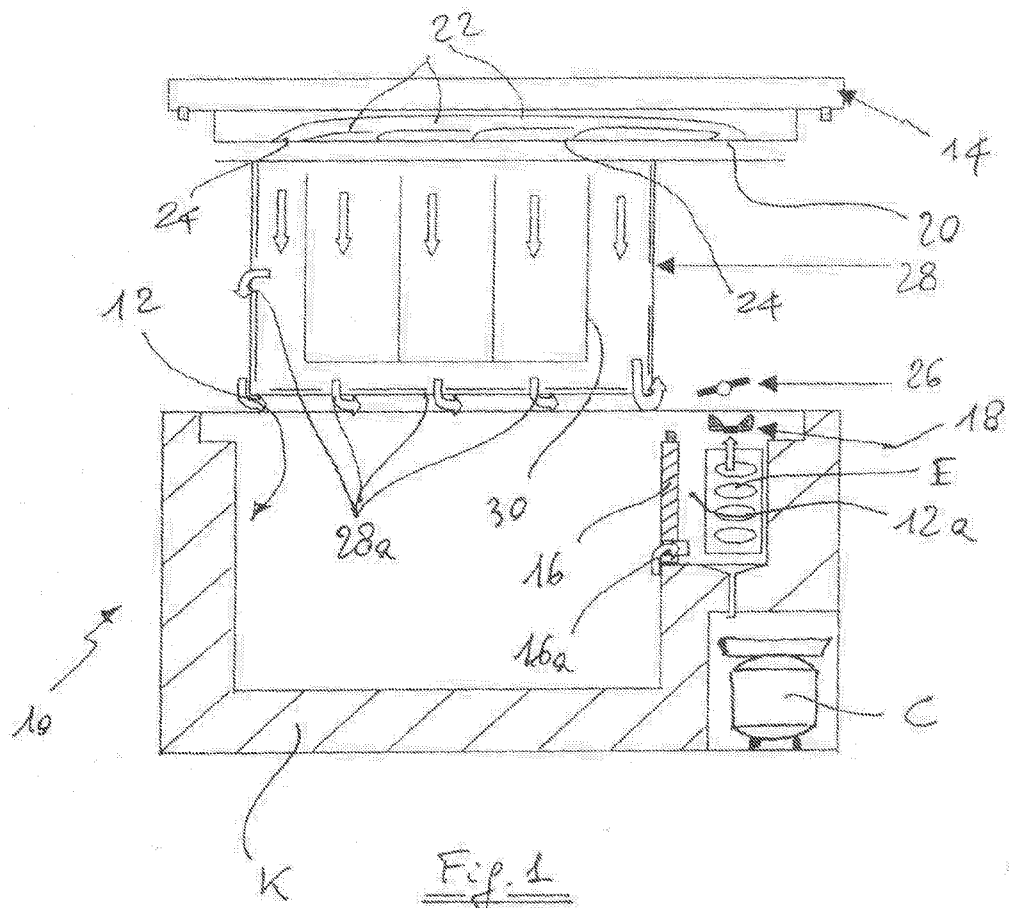
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EUROPEAN SEARCH REPORT

Application Number
EP 06 10 0188

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 May 2006	Examiner Yousufi, S
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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**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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