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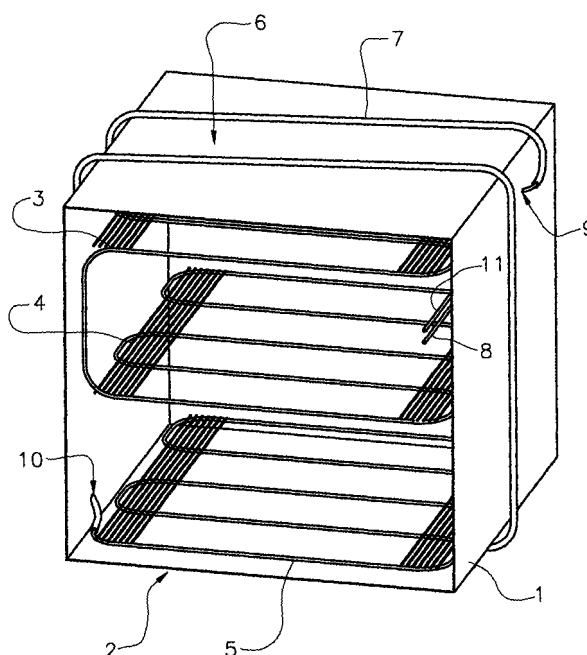
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(54) **Improved refrigerator cooling system**

(57) The present invention refers to an improved cooling system for a refrigerator, preferably a domestic refrigerator, comprising a cell in which is located at least one compartment for the storage of food below freezing point, with said compartment being cooled using at least

one wire tube evaporator arranged on at least one wall of said cell. It is provided for according to the invention that a wire tube evaporator (3, 4, 5) arranged inside said cell (1) is hydraulically connected to a tube evaporator (7), which extends in a manner similar to a coil (6) along the outer periphery of said cell (1).



**Fig. 1**

## Description

**[0001]** The present invention relates to an improved cooling system for a refrigerator, preferably a domestic refrigerator, comprising a cell in which is located at least one compartment for the storage of food below freezing point, with said compartment being cooled by means of at least one wire tube evaporator arranged on at least one wall of said cell.

**[0002]** A refrigerator cooling system of the aforementioned type is known. There is for example a solution in which the appropriate temperature in the refrigerator is achieved using a wire tube evaporator which, together with the cooling system for the refrigeration unit, is designed as a single element and extends horizontally between the drawers for the storage of food and along the walls of the cooling unit and/or refrigerator. The drawback of this solution lies in the fact that, with the method described, the usable volume of the refrigerator is greatly reduced.

**[0003]** It is the object of the present invention to create an improved cooling system for a refrigerator, with which the drawbacks of known solutions are remedied and, at the same time, the efficiency of the refrigerator is increased.

**[0004]** The object as set above is achieved according to the present invention in a manner that a wire tube evaporator arranged in the interior of a refrigerator cell being linked hydraulically with a tube evaporator extending in a form similar to a coil along the outer periphery of said compartment. However, it is understood that, without departing from the spirit and scope of the invention, said tube evaporator can extend in a meander-like manner in the plane of at least one of the walls of said cell of the refrigerator. Said tube evaporator furthermore extends entirely in the insulation of said cell. It is provided for, according to the invention, that said tube evaporator is installed in the refrigerator before the installation of the insulation and before the assembly of the refrigerator. Furthermore, it is provided for according to the invention that said wire tube evaporator is installed in said refrigerator when the latter is completely assembled, with each free end of said wire tube evaporator being hydraulically connected to each free end of said tube evaporator projecting inside the cooling area of the refrigerator. Furthermore, each said free end of said wire tube evaporator is connected hydraulically with each said free end of said tube evaporator by means of a cold junction provided by mechanical deformation.

**[0005]** The invention is described below in greater detail with reference to an appended diagram, which shows three-dimensionally a cooling system of a refrigerator in accordance with the invention.

**[0006]** The refrigerator according to the invention comprises a cell 1, inside which is located a refrigerating space 2 being divided vertically into several compartments where drawers for the freezing and/or storage of food are located. Each said compartment and drawer,

respectively, is separated in a manner known per se by means of a wire tube evaporator 3, 4, 5, each of which is preferably arranged in a horizontal plane. Said cell 1 of the refrigerator is surrounded by an insulation not shown. In order to improve the efficiency of the refrigerator, said cell 1 is surrounded in a form similar to a coil 6 by a tube evaporator 7, extending entirely within the insulation of said cell 1. Obviously, it is understood that, without departing from the spirit and scope of the invention, said tube evaporator 7 can extend in a meander-like manner in the plane of at least one of the walls of said cell 1.

**[0007]** Furthermore, the first end 8 of said wire tube evaporator, shown on the diagram as the upper wire tube evaporator 3, extends from a condenser not shown into the cell 1 in a manner known per se. Said first wire tube evaporator 3 then extends into the second wire tube evaporator, which is shown on the diagram as the middle wire tube evaporator 4, and extends onward into the third wire tube evaporator, which is shown on the diagram as the lower wire tube evaporator 5.

**[0008]** The free end of said lower wire tube evaporator 5 is connected in the area of the wall to the tube evaporator 7, which at the point 10 passes through the wall of said cell 1 and exits said cell 1 and, as already mentioned, in the manner similar to the coil 6 winds around said cell 1 in the insulation of the cell 1. The free end 11 of said tube evaporator 7 at the point 9 passes through the wall of the cell 1 and extends in a manner known per se either into the refrigeration unit or the compressor of the refrigerator.

**[0009]** Furthermore, it is provided for according to the invention that the path of the cooling medium may also be inverted. This means that the first end 8 of the first wire tube evaporator 3 extends from the compressor not shown into the cell 1 in a manner known per se, and the free end 11 of said tube evaporator 7 passing through the wall of the cell 1 at the point 9, extends into the condenser in a manner known per se.

**[0010]** In addition, it is provided for according to the invention that said tube evaporator 7 is wound around said cell 1 before installation of the insulation and before assembly of the refrigerator. It is also provided for that each of said wire tube evaporators 3, 4, 5 are installed in the refrigerator when the latter is entirely assembled.

**[0011]** According to the invention it is provided for that the connection between the wire tube evaporator 5 and the tube evaporator 7 is formed by means of a cold junction provided by plastic deformation.

## Claims

1. Improved refrigerator cooling system, preferably for a domestic refrigerator, comprising a cell (1) in which is located at least one compartment for the storage of food below freezing point, with said compartment being cooled using at least one wire tube evaporator

(3, 4, and 5), arranged along at least one wall of said cell (1), **characterised in that** each wire tube evaporator (3, 4, and 5) arranged inside said cell (1), is hydraulically connected to a tube evaporator (7), which, in the manner similar to a coil (6), extends along the outer periphery of said cell (1). 5

2. Improved refrigerator cooling system according to claim 1, **characterised in that** said tube evaporator (7) extends in a meander-like manner in the plane of at least one of the walls of said cell (1). 10
3. Improved refrigerator cooling system according to claims 1 and 2, **characterised in that** said tube evaporator (7) is installed in the refrigerator before installation of the insulation and before assembly of the refrigerator. 15
4. Improved refrigerator cooling system according to any of the preceding claims, **characterised in that** said wire tube evaporator (3, 4, 5) is installed in the refrigerator when the latter is entirely assembled, and the free end of said wire tube evaporator (3, 4, 5) is hydraulically connected to the free end of said tube evaporator (7) projecting into the interior of the cell (1) of the refrigerator. 20 25
5. Improved refrigerator cooling system according to any of the preceding claims, **characterised in that** said free end of said wire tube evaporator (3, 4, 5) is hydraulically connected to said free end of said tube evaporator (7) by means of a cold junction provided by plastic deformation. 30

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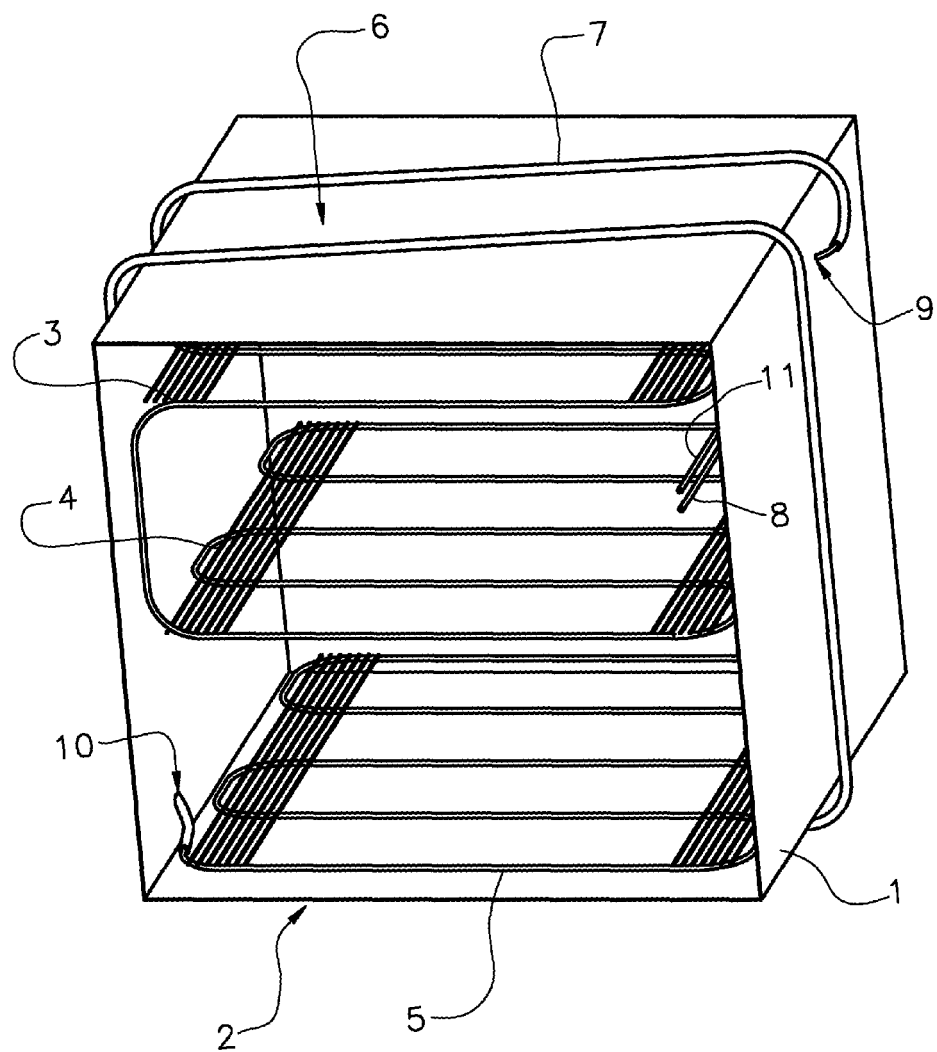


Fig. 1