(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
20 May 2010 (20.05.2010)

PCT

(10) International Publication Number
WO 2010/055076 A2

(51) International Patent Classification:
*F25D 21/14* (2006.01)

(21) International Application Number:
PCT/EP2009/065016

(22) International Filing Date:
12 November 2009 (12.11.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
A 2008/08609 12 November 2008 (12.11.2008) TR

(71) Applicant *(for all designated States except US)*: **ARCELIK ANONIM SIRKETI** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **CETINTURK, Oguz** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **GIZLICE, Gozde** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **MOZA, A., Onur** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR). **OZTURK, Fatih, M.** [TR/TR]; E5 Ankara Asfalti Uzeri, Tuzla, 34950 Istanbul (TR).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

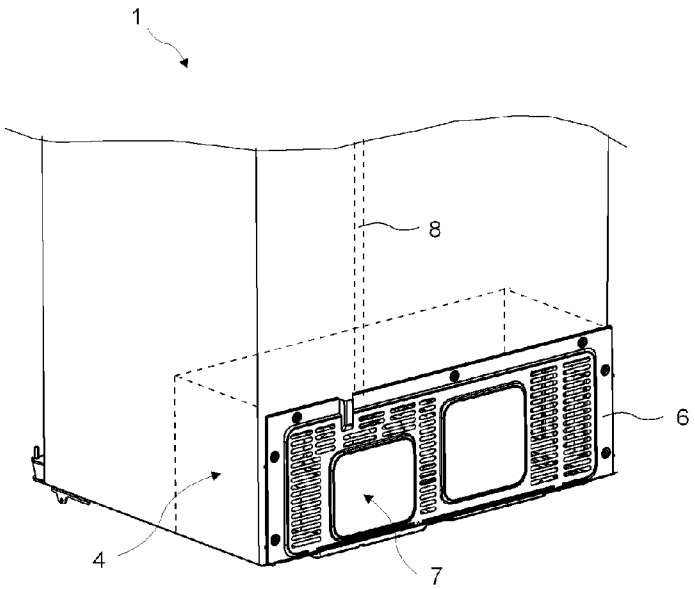
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published**:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(54) **Title**: A COOLING DEVICE COMPRISING AN EVAPORATION TRAY

**Figure 1**




(57) **Abstract**: The present invention relates to a cooling device (1) comprising a body, a compressor (2) for maintaining the refrigeration cycle, a condenser (3) for condensing the refrigerant, a casing (4) wherein the compressor (2) and the condenser (3) are disposed, a fan (5) situated inside the casing (4) for cooling the condenser (3) and the compressor (2) by blowing air thereon, a cover (6), situated under the rear wall of the body, that covers the casing (4) and prevents access to the compressor (2) and the other components in the casing (4), an evaporation tray (7) situated inside the casing (4) for collecting the water during the defrost process to be evaporated thereafter and a discharge hose (8) that extends from the body into the casing (4) for transferring the defrost water into the evaporation tray (7).

WO 2010/055076 A2

Description

# A COOLING DEVICE COMPRISING AN EVAPORATION TRAY

[0001] The present invention relates to a cooling device comprising an evaporation tray which enables evaporation of the defrost water.

[0002] In cooling devices, for example refrigerators or freezers, the defrost process is performed in order to deice the frost formed on the refrigeration system. In the defrost process, a container named as the evaporation tray is used wherein the water is collected and evaporated. In the known embodiments, the evaporation tray is placed on the compressor and the heat received from the compressor evaporates the water therein. The evaporation tray is produced such that it will be properly seated on the upper side of the compressor and to take the shape of the compressor body so that noise is not generated due to vibrations of the compressor; and when the compressor type is changed, the evaporation tray has to be changed also. Designing the evaporation tray separately for different types of compressors causes an increase in the costs.

[0003] In the Korean patent document no KR19990012724, in a refrigerator a water collection tray is explained that stores the defrost water and which is integrated to the stand in order to utilize the inner volume more.

[0004] In the United States of America patent application no US2007051122, a housing is provided on the compressor of a refrigeration device and the evaporation tray is mounted on this housing.

[0005] The aim of the present invention is the realization of a cooling device that comprises a single type of evaporation tray suitable to be utilized with different types of compressors.

[0006] The cooling device realized in order to attain the aim of the present invention is explicated in the claims.

[0007] The cooling device of the present invention comprises a compressor that maintains the refrigeration cycle, a casing situated preferably at the rear and bottom side of the body wherein the compressor is placed together with the components such as the condenser and the fan, a cover that covers the casing and prevents access to the components therein, and an evaporation tray, again disposed inside the casing for collecting and

evaporating the water during the defrost process. The evaporation tray is integrated on the surface of the cover facing inside the casing such that it is just behind the compressor when the cover is closed.

[0008] The evaporation tray integrated to the cover, is configured as a flat box that protrudes lies from the cover toward the compressor and has a depth as much as the distance between the cover and the compressor at maximum.

[0009] The evaporation tray comprises a wide heat transfer surface that faces the compressor body and is parallel to the plane of the cover.

[0010] The evaporation tray furthermore comprises a water inlet orifice arranged on its upper surface whereto the defrost water discharge hose is connected and an opening for the exit of the evaporated water.

[0011] In an embodiment of the present invention, the evaporation tray is produced as a piece separate from the cover and is mounted on the cover thereafter.

[0012] In another embodiment of the present invention, the evaporation tray is produced as a single piece together with the cover.

[0013] The evaporation tray is provided on the flow path of the air aspirated into the casing by the fan from the holes on the cover and discharged out after passing over the condenser and the compressor, the heat of the condenser and the compressor carried by the air affects on the evaporation tray and thereby the water can be evaporated more quickly.

[0014] The cooling device realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0015] Figure 1 - is the partial perspective view of a cooling device.

[0016] Figure 2 - is the top schematic view of the casing containing the components such as the compressor, condenser and the fan in a cooling device.

[0017] Figure 3 - is the perspective view of a cover and an evaporation tray integrated to the cover.

[0018] Figure 4 - is the perspective view of a cover, an evaporation tray integrated to the cover and the compressor disposed in front of the evaporation tray.

[0019] The elements illustrated in the figures are numbered as follows:

1. Cooling device
2. Compressor
3. Condenser
4. Casing
5. Fan
6. Cover
7. Evaporation tray
8. Discharge hose
9. Heat transfer surface
10. Water inlet orifice
11. Opening

[0020] The cooling device (1), for example the refrigerator or the freezer, comprises a body, a compressor (2) for maintaining the refrigeration cycle, a condenser (3) for condensing the refrigerant, a casing (4) wherein the compressor (2) and the condenser (3) are disposed, a fan (5) situated inside the casing (4) for cooling the condenser (3) and the compressor (2) by blowing air thereon, a cover (6) that covers the casing (4) and prevents access to the compressor (2) and the other components in the casing (4), an evaporation tray (7) situated inside the casing (4) for collecting the water during the defrost process to be evaporated thereafter and a discharge hose (8) that extends from the body into the casing (4) for transferring the defrost water into the evaporation tray (7).

[0021] The cooling device (1) of the present invention comprises an evaporation tray (7) which is integrated on the surface of the cover (6) facing inside the casing (4) such that it is aligned with the compressor (2), and protrudes from the cover (6) towards the compressor (2) (Figures 2 and 4).

[0022] The evaporation tray (7) is integrated with the cover (6) such that the said evaporation tray (7) remains between the cover (6) and the compressor (2) and the heat disseminating from the compressor (2) body is effectively utilized since the evaporation tray (7) is at a position close to the compressor (2).

[0023] In the cooling device (1) of the present invention, the ice on the evaporator

dissolves at the end of the defrost process and water received by the discharge hose (8) is collected in the evaporation tray (7) integrated to the cover (6). Water in the evaporation tray (7), which protrudes from the cover (6) to near the compressor (2), is evaporated by utilizing the heat of the compressor (2) when the cover (6) is closed. The evaporation tray (7) is shaped like a protrusion on the rear surface of the cover (6) and occupies a minimum amount of space inside the casing (4) thereby the interior volume of the casing (4) is used efficiently.

[0024] The evaporation tray (7) comprises a heat transfer surface (9) which faces the compressor (2) body and is parallel to the plane of the cover (6). The heat transfer surface (9) is disposed behind the compressor (2) such that a vertical wall is formed when the cover (6) is closed.

[0025] The evaporation tray (7), because of the limited volume in the casing (4), is configured as a flat box, having a depth (W) as much as the distance between the cover (6) and the compressor (2) at the maximum and comprises a heat transfer surface (9) having a wide area (Figure 2).

[0026] The evaporation tray (7) furthermore comprises a water inlet orifice (10) arranged on its upper surface whereto the discharge hose (8) is connected and an opening (11) for the exit of the evaporated water. The defrost water coming by means of the discharge hose (8) is collected in the evaporation tray (7) and the water evaporating due to the heat of the compressor (2) is expelled from the opening (11) (Figure 3).

[0027] In an embodiment of the present invention, the evaporation tray (7) is produced as a piece separate from the cover (6) and mounted on the cover (6) thereafter.

[0028] In another embodiment of the present invention, the evaporation tray (7) is produced as a single piece together with the cover (6).

[0029] The evaporation tray (7) is provided on the flow path of the air aspirated by the fan (5) into the casing (4) from the holes (D) on the cover (6) and discharged out after passing over the condenser (3) and the compressor (2), the heat of the condenser (3) and the compressor (2) is carried by the air and affects on the evaporation tray (7) and thereby the water can be evaporated more quickly (Figure 2).

[0030] In the cooling device (1) of the present invention, since the dimensions and shape of the evaporation tray (7) do not depend on the compressor (2), a single type evaporation tray (7) can be used even if the type of the compressor (2) changes, moreover when the evaporation tray (7) has to be taken outside, dismounting only the cover (6) is sufficient and the evaporation tray (7) can be taken out of the cooling device (1) body together with the dismounted cover (6).

[0031] The present invention is not limited to the embodiments disclosed above and a skilled person in the art can easily introduce different embodiments. These should be considered within the scope of the protection disclosed by the claims of the present invention.

## Claims

1. A cooling device (1) comprising a compressor (2) for maintaining the refrigeration cycle, a casing (4) wherein the compressor (2) is disposed, a cover (6) that covers the casing (4) and prevents access to the compressor (2) and the other components in the casing (4), an evaporation tray (7) situated inside the casing (4) for collecting the water during the defrost process to be evaporated thereafter and a discharge hose (8) for transferring the defrost water into the evaporation tray (7) **and characterized by** the evaporation tray (7) which is integrated on the surface of the cover (6) facing inside the casing (4) such that it is aligned with the compressor (2) and protruding from the cover (6) towards the compressor (2).
2. A cooling device (1) as in Claim 1, **characterized by** the evaporation tray (7) which is integrated with the cover (6) such that the said evaporation tray (7) remains between the cover (6) and the compressor (2).
3. A cooling device (1) as in Claim 1 or 2, **characterized by** the evaporation tray (7) comprising a heat transfer surface (9) facing the compressor (2) body and is parallel to the plane of the cover (6).
4. A cooling device (1) as in any one of the above Claims, **characterized by** the evaporation tray (7) configured as a flat box, having a depth (W) as much as the distance between the cover (6) and the compressor (2) at maximum.
5. A cooling device (1) as in any one of the above Claims, **characterized by** the evaporation tray (7) comprising a water inlet orifice (10) arranged on its upper surface whereto the discharge hose (8) is connected and an opening (11) for the exit of the evaporated water.
6. A cooling device (1) as in any one of the above Claims, **characterized by** the evaporation tray (7) which is produced as a piece separate from the cover (6) and mounted on the cover (6) thereafter.
7. A cooling device (1) as in any one of the Claims 1 to 5, **characterized by** the evaporation tray (7) which is produced as a single piece together with the cover (6).
8. A cooling device (1) as in any one of the above Claims, **characterized by** a condenser (3) for condensing the refrigerant, a fan (5) for cooling the condenser (3) and the compressor (2) by blowing air thereon and an

evaporation tray (7) which is provided on the flow path of the air aspirated by the fan (5) into the casing (4) from the holes (D) on the cover (6) and discharged out after passing over the condenser (3) and the compressor (2), disposed in the casing (4).

**Figure 1**

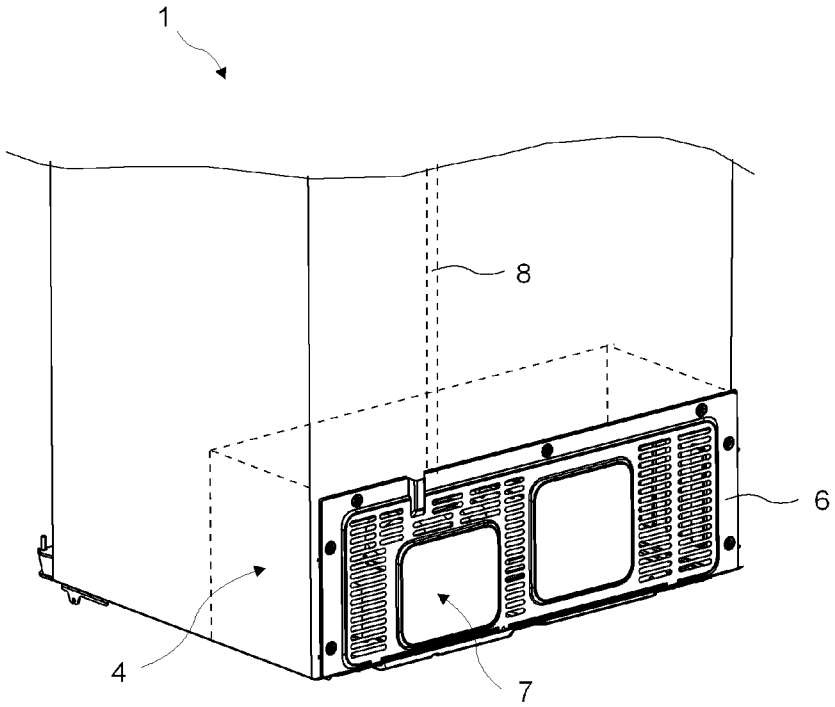



**Figure 2**

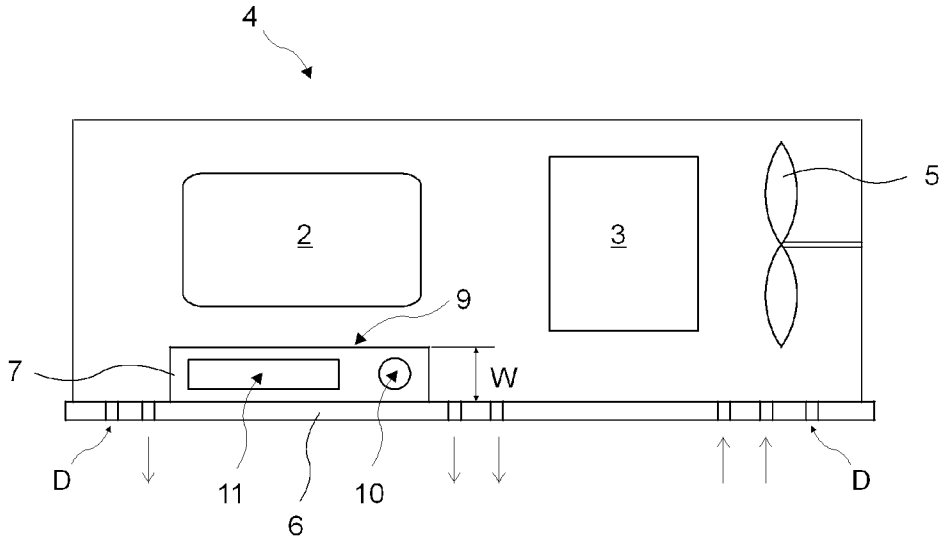


**Figure 3**

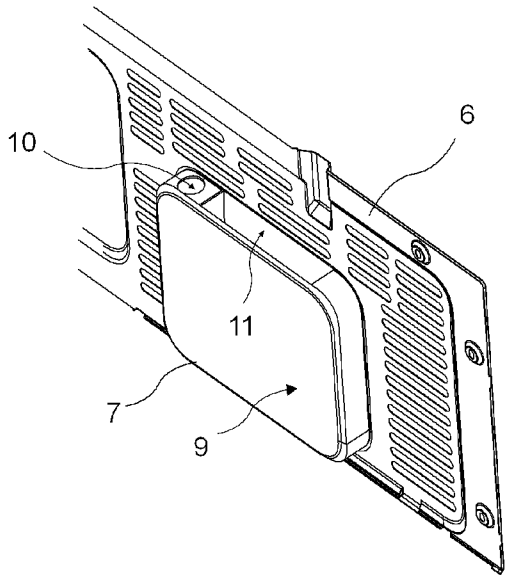



**Figure 4**