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(54) **A COOLING DEVICE HAVING WATERPROOF DRIP TRAY**

(57) The present invention relates to a cooling device comprising; a compressor (1), an evaporator, a bracket attached onto the compressor (1) forming a conduit in-between, a drip tray (2) to be placed onto the compressor (1) wherein the drip tray (2) is configured to be fluidly communicated with the evaporator via a water discharge line such that the water discharged through said water discharge line is collected into the drip tray (2), the drip tray (2) comprising a fastening means (3) via which the drip tray (2) is removable placed onto the compressor (1) via the conduit.

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Description

[0001] The present invention relates to a cooling device, in particular to a cooling device having waterproof drip tray assembly means.

[0002] The present invention relates to a cooling device having a drip tray that enables the water ensuing from the defrost process to be collected. In cooling devices, for example freezers and refrigerators, the defrost process is carried out in order to remove the frost, accumulating on the evaporator which in time affects the energy efficiency of the cooling device if left unattended. The water resulting from the defrost process is carried to a drip tray provided on or in close vicinity of the compressor. The heat resulting during the operation of the compressor is used to vaporize the water. In the state of the art embodiments, the drip tray is placed on the compressor via clips, wherein the clips are provided on a lower surface of the drip tray. The assembly personnel place the drip tray on the compressor wherein the clips are inserted inside a bracket provided on the compressor. A problem with the state of the art is that the drip tray, once it is fixed on the compressor via a fastening means, remains on the compressor. The drip tray, if needed to be removed from the compressor, the assembly personnel needs to break the fastening means rendering the drip tray useless. Therefore, the manufacturing costs of the cooling device increases. Another problem with the state of the art is that the water discharge line carrying the water ensuing due to the defrost process move on the drip tray which causes the water discharged to pour over the fastening means via which the drip tray is attached onto the compressor. The water leaks via the opening provided for the fastening means and reaches compressor which in time causes formation of rust or even flooding of the environment wherein the cooling device is kept.

[0003] A prior art publication in the technical field of the present invention may be referred to as US20110232314A1 among others, the document disclosing a cooling appliance having a condensation collection chamber.

[0004] A prior art publication in the technical field of the present invention may be referred to as EP3102898B1 among others, the document disclosing a cooling appliance having an evaporation tray.

[0005] An objective of the present invention is to prevent or minimize the amount of drip trays scrapped during the assembly process which in turn decreases the manufacturing costs.

[0006] Another objective of the present invention is to prevent water leakages.

[0007] The method realized to achieve the aim of the present invention and disclosed in the first claim and the dependent claims comprises a cooling device. The cooling device comprises a compressor and an evaporator. The compressor compresses the coolant and pumps the coolant into the cooling cycle. As the coolant passes through the evaporator, it expands, absorbs heat thus cooling the surface of the evaporator. A fan is provided to circulate the air inside the compartments of the cooling device by passing the air through the evaporator. The humidity in the air freezes on the surface of the evaporator forming a layer of frost. The frost layer gets thicker in time, decreasing energy efficiency of the cooling device. Therefore, the cooling devices perform defrost process on regular intervals. The water ensuing from the defrost process is collected inside a drip tray. The drip tray and the evaporator are connected via a water discharge line fluidly connecting the evaporator to the drip tray. As a result, the water ensuing from the defrost process is collected inside the drip tray. The drip tray is placed onto the compressor. The compressor has a casing enclosing the operational parts of the compressor hermetically from the outer environment. A bracket is placed onto the casing of the compressor. The bracket is in the shape of a "U" profile and form a conduit upon being placed onto the compressor. The drip tray comprises an aperture through which the bracket passes through upon placing the drip tray onto the compressor. A fastening means is provided via which the drip tray is removable placed onto the compressor. The drip tray further comprises a lug wherein the lug is attached to the drip tray in a pivotable manner between a closed position and an open position. During the open position, the lug protrudes away from the drip tray. During the closed position, the lug is pivoted with respect to the drip tray and folds onto the drip tray. The fastening means is accommodated inside an opening. During the closed position, the lug encloses the fastening means and the opening thereby preventing leakage of water. During the closed position, the lug forms a flush surface with the drip tray. By means of the lug, water leakages are prevented. Another advantageous effect of using the lug is that the lug can releasably enclose the fastening means. By means of this, the assembly line workers can pivot the lug to the open position if the fastening means is not seated onto the bracket properly. As a result, scrapping of drip trays is decreased.

[0008] In an embodiment of the invention, the lug is produced as an integral part of the drip tray. By this means, mold related costs improve and also a robust structure for the lug and the drip tray is achieved.

[0009] In an embodiment of the invention, the lug comprises a pair of clips. As the position of the lug changes from open position to the closed position, the clips engage with the fastening means locking the clips and therefore the lug onto the drip tray. The clips needed to be compressed or pressed should the user or the assembly line worker needs to change the position of the lug from closed position to the open position. By means of the clips, ease of use is provided for the assembly line workers if they need to remove the drip tray from the compressor.

[0010] In an embodiment of the invention, the fastening means comprises a pair of slots. The pair of clips are inserted inside the said slots in the closed position of the

lug. By means of the slots and the clips, the drip tray is attached onto the compressor in an unmovable and robust manner.

[0011] In an embodiment of the invention, the lug comprises a sealing member. In an embodiment the sealing member is a gasket. The sealing member at least partially surrounds the lower surface of the lug in the closed position. In an embodiment, a channel is provided around the fastening means into which the sealing member is seated thereby providing further waterproofness.

[0012] By means of the present invention, the drip tray is removable placed onto the compressor minimizing the amount of drip trays scrapped during the assembly process.

[0013] Another advantageous effect of the present invention is that the water leakages are prevented by means of the lug completely enclosing the fastening means and the opening wherein the fastening means is accommodated. Sealing member provides further waterproofness.

[0014] The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret the scope identified in the claims without recourse to the technical disclosure in the description of the present invention.

Figure 1 - is a cross sectional side view of the cooling device
Figure 2 - is a top view of the drip tray
Figure 3 - is a side view of the drip tray
Figure 4 - is an isolated view of the lug

[0015] The following numerals are assigned to different parts demonstrated in the drawings and referred to in the present detailed description of the invention:

1. Compressor
2. Drip tray
3. Fastening means
4. Lug
5. Clip
6. Slot
7. Sealing member

[0016] The present invention relates to a cooling device comprising; a compressor (1), an evaporator, a bracket attached onto the compressor (1) forming a conduit in-between, a drip tray (2) to be placed onto the compressor (1) wherein the drip tray (2) is configured to be fluidly communicated with the evaporator via a water discharge line such that the water discharged through said water discharge line is collected into the drip tray (2), the drip tray (2) comprising a fastening means (3) via which the drip tray (2) is removable placed onto the compressor (1) via the conduit.

[0017] The present invention relates to a cooling device (1), comprising the drip tray (2) wherein the drip tray (2) comprises; a lug (4) pivotable attached to the drip tray (2) between an open position during which the lug (4) protrudes away from the drip tray (2), and a closed position during which the lug (4) is folded over to the drip tray (2) releasably enclosing the fastening means (3). The drip tray (2) is used to collect the water ensuing from the defrost process. The water is transferred to the drip tray (2) via a water discharge line. The heat resulting from the operation of the compressor (1) is used to vaporize the water collected inside the drip tray (2). The drip tray (2) is removable attached onto the compressor (1) via the fastening means (3) provided on the drip tray (2). The fastening means is visible upon being placed onto the compressor (1). A cut out volume is provided on the drip tray (2) wherein the said cut out volume accommodates the fastening means (3). The drip tray (2) further comprises the lug (4). The lug (4) has two positions. During the open position, the lug (4) protrudes away from the drip tray (2). During the closed position, the lug (4) folds onto the drip tray (2) enclosing the said cut out volume and therefore the fastening means (3). During the closed position, the fastening means (3) and the cut out volume is hidden from view. During the open position, the fastening means (3) is visible and the user may activate the fastening means (3) if the drip tray (2) is needed to be removed from the compressor (1). During the closed position, the lug (4) encloses the fastening means (3) in a waterproof manner. Therefore, water leakages are prevented. Another advantageous effect provided by means of this invention is that the lug (4) can be changed towards the open position should the user or the assembly line workers need to remove the drip tray (2). By means of this, number of scrapped drip trays is reduced.

[0018] In a preferred embodiment of the invention, the lug (4) is integral with the drip tray (2). By means of the lug (4) being an integral part of the drip tray (2), structural strength is achieved. Another advantageous effect provided is that the drip tray (2) can be produced with a single mold, thereby decreasing costs.

[0019] In a preferred embodiment of the invention, the lug (4) comprises a pair of clips (5) which upon being pressed or compressed releases the lug (4) from the drip tray (2). The clips (5) passes through the cut out accommodating the fastening means (3). The clips (5) provides a reliable and convenient method for changing the position of the lug (4) from closed to open.

[0020] In a preferred embodiment of the invention, the fastening means (3) comprises a pair of slots (6) into which the pair of clips (5) are seated in the closed position. The slots (6) extend along the extension direction of the fastening means (3). The slots (6) accommodate the clips (5) in closed position of the log (4).

[0021] In a preferred embodiment of the invention, the lug (4) comprises a sealing member (7), providing waterproofness in the closed position. The sealing member (7) extends along the periphery of the lug (4) and provides waterproofness for the lug (4).

Claims

1. A cooling device comprising;
a compressor (1),
an evaporator,
a bracket attached onto the compressor (1) forming a conduit in-between,
a drip tray (2) to be placed onto the compressor (1) wherein the drip tray (2) is configured to be fluidly communicated with the evaporator via a water discharge line such that the water discharged through said water discharge line is collected into the drip tray (2), the drip tray (2) comprising a fastening means (3) via which the drip tray (2) is removable placed onto the compressor (1) via the conduit,
characterized in that
the drip tray (2) comprises;
a lug (4) pivotable attached to the drip tray (2) between an open position during which the lug (4) protrudes away from the drip tray (2), and a closed position during which the lug (4) is folded over to the drip tray (2) releasably enclosing the fastening means (3).

2. A cooling device (1) according to claim 1, **characterized in that** the lug (4) is integral with the drip tray (2).

3. A cooling device (1) according to any of the preceeding claims, **characterized in that** the lug (4) comprises a pair of clips (5) which upon being pressed or compressed releases the lug (4) from the drip tray (2).

4. A cooling device (1) according to claims 3, **characterized in that** the fastening means (3) comprises a pair of slots (6) into which the pair of clips (5) are seated in the closed position.

5. A cooling device (1) according to any of the preceeding claims, **characterized in that** the lug (4) comprises a sealing member (7), providing waterproofness in the closed position.

Figure 1

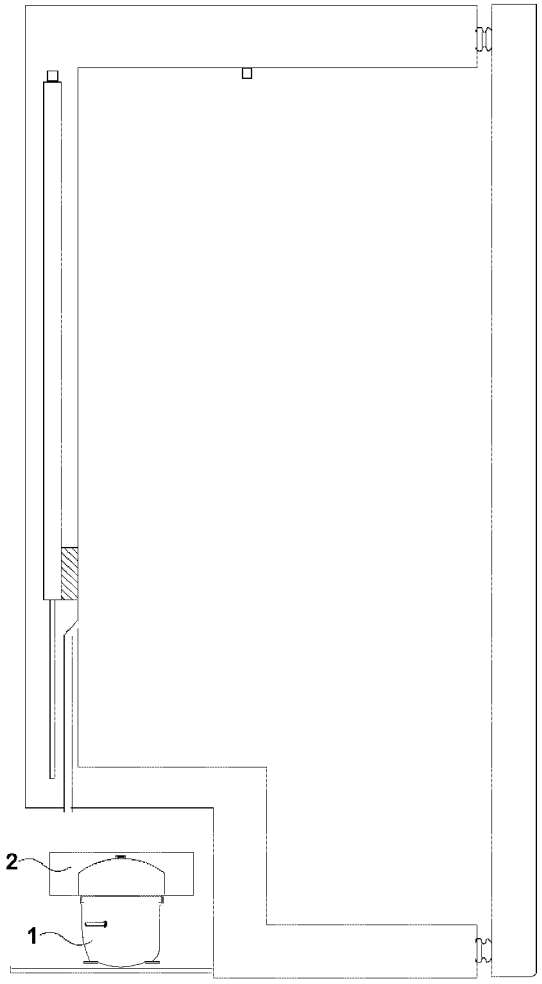


Figure 2

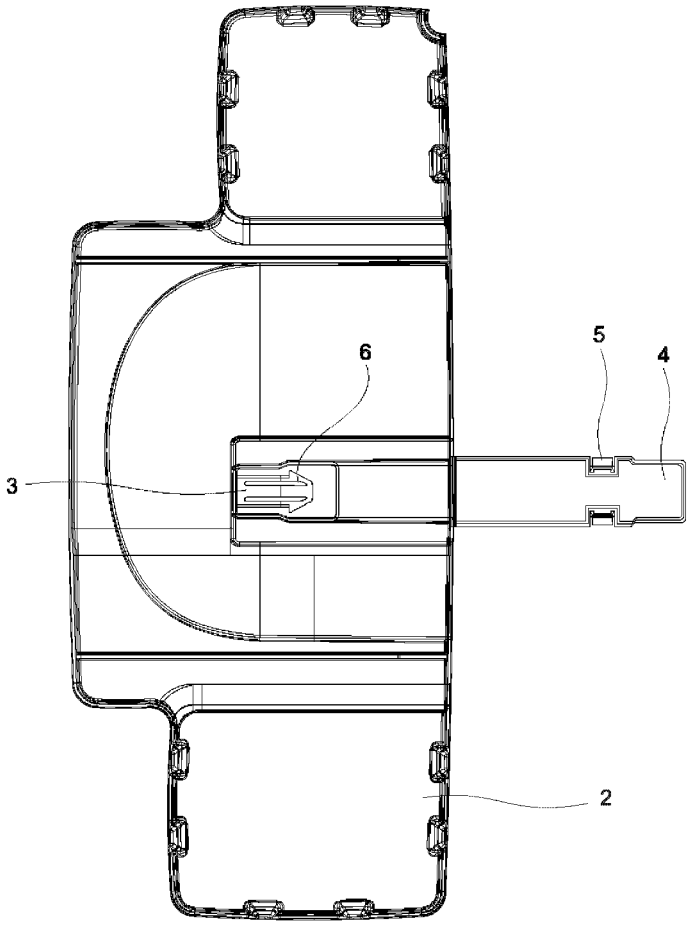


Figure 3

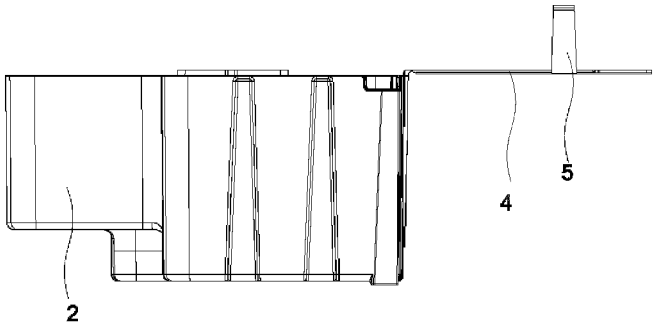
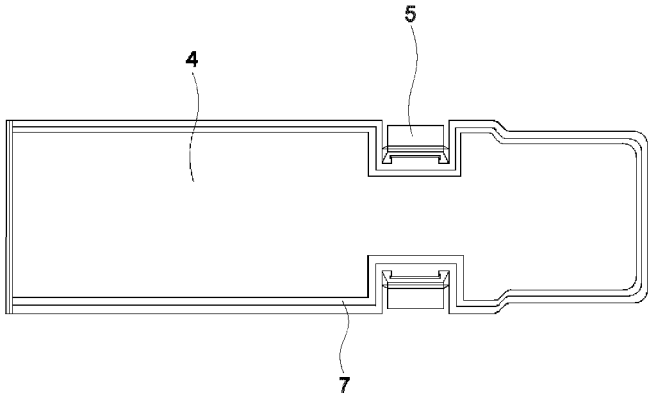


Figure 4



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EUROPEAN SEARCH REPORT

Application Number
EP 20 21 0259

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2014 208118 A1 (BSH HAUSGERÄTE GMBH [DE]) 5 November 2015 (2015-11-05) * abstract; figures 1-9 * * paragraphs [0037], [0038] *	1-5	INV. F25D21/14
X	CN 202 709 611 U (HEFEI MIDEA ROYALSTAR REFRIGER) 30 January 2013 (2013-01-30) * abstract; figures 1-5 *	1-5	
A,D	EP 3 102 898 B1 (ARCELIK AS [TR]) 12 September 2018 (2018-09-12) * abstract; figures 1-6 *	1-5	

TECHNICAL FIELDS SEARCHED (IPC)

F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 April 2021	Yousufi, Stefanie

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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21-04-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102014208118 A1	05-11-2015	NONE	
CN 202709611 U	30-01-2013	NONE	
EP 3102898 B1	12-09-2018	EP 3102898 A1	14-12-2016
		TR 201721791 T3	22-01-2018
		WO 2015113982 A1	06-08-2015

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20110232314 A1 **[0003]**
- EP 3102898 B1 **[0004]**