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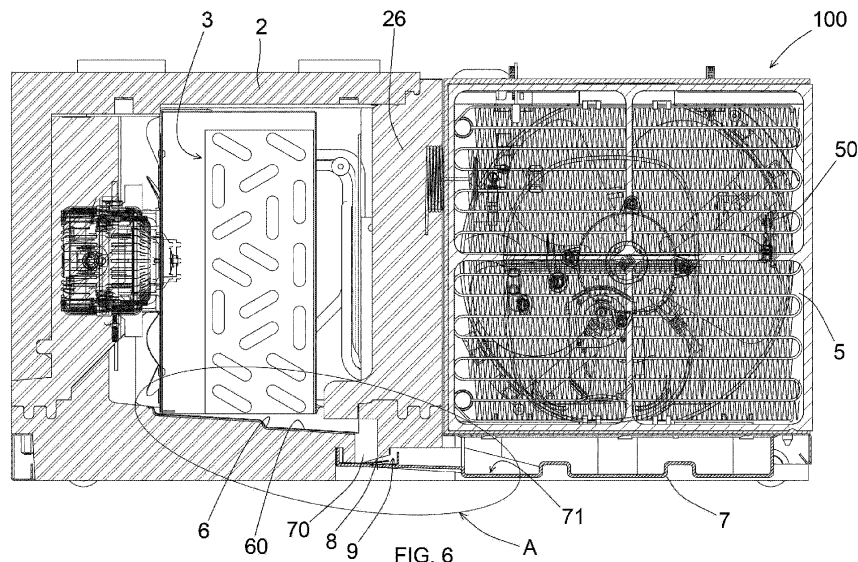
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(54) **CASSETTE UNIT FOR REFRIGERATED DISPLAY CABINETS HAVING A SYSTEM FOR PREVENTING THE PASSAGE OF AIR FROM THE OUTSIDE**

(57) Cassette unit (100) comprising: a basement (1), a body (2) wherein an evaporator (3) is arranged, a compressor (4) and a condenser (5) arranged on the outside of the basement (1), a drip tray (6) to receive the defrost water dripping from the evaporator (3) during the defrost cycle, and a collection tank (7) in communication with the drip tray (6) in order to collect the defrost water; the collection tank (7) comprises a first reservoir (70) disposed

under an outlet (61) of a drain conduit of the drip tray and a second reservoir (71) in overflow communication with the first reservoir (70); the cassette unit (100) comprises siphon means (9) configured in such a way to allow a passage of water from the drain conduit (60) of the drip tray to the first reservoir (70), and prevent a passage of air from outside the body (2) through the first reservoir (70).



Description

[0001] The present invention relates to a cassette unit for refrigerated display cabinets for food products and beverages.

[0002] A cassette unit is a complete refrigeration unit (finished machine) for the refrigeration of refrigerated displays, such as refrigerated cabinets, refrigerated display cases, refrigerated counters, and the like. The cassette unit comprises components (compressor, condenser, lamination element, evaporator, and control electronics) that are necessary for performing a thermodynamic compression refrigeration cycle. All components are mounted in a single self-supporting structural case/basement. The cassette unit is equipped with intake conduits of external air and delivery conduits of cooled air. Such a unit is inserted into the refrigerated display cabinets, in correspondence with air inlet and outlet conduits of the refrigerated display cabinets that generate a flow of cold air in the refrigerated display cabinet for the storage of consumer products.

[0003] Before the advent of the cassette units, the components of the refrigeration system were located in different areas of the refrigerated display cabinet, depending on the function they were to perform. With reference to Fig. 1, the cold function (evaporator) is arranged in the product storage area. The hot function (condenser + compressor) is arranged in an engine compartment outside the storage area.

[0004] The idea of having both the cold generation components and the heat elimination components in the same area comes from the need to reduce the complexity dictated by the numberless solutions introduced in the realization of the refrigeration systems. One of the main strengths of the cassette unit technology consists in the fact that such a unit is perfectly interfaced with the refrigeration display cabinet, and is a stand-alone unit that does not require the presence of the refrigeration system components (e.g., fan, evaporator) mounted inside the refrigeration display cabinet, thus resulting in easy disassembly, accessibility for maintenance and easy replacement on site, in case of failures that cannot be solved immediately.

[0005] In addition, the cassette unit meets the ever-increasing demand of the market for eco-sustainability and easy disposal because components and materials in line with the need to have an increasingly reduced environmental impact were evaluated in the study of this solution.

[0006] Currently, the global market offers cassette units that differ in the technical installation solutions depending on the type of end product. Figs. 2A, 2B, and 2C illustrate three examples of cassette units (100) installed on a roof, in a basement, and on a side of a refrigerated display cabinet (200), respectively.

[0007] Figs. 3A, 3B and 3C illustrate the cassette unit (100) of Fig. 2A. The cassette unit (100) comprises a basement (1). A body (2) is mounted on the basement

(1) and defines a compartment wherein an evaporator (3) is arranged. A compressor (4) and a condenser (5) are arranged on the basement (1) outside the body (2). It should be considered that the evaporator (3) is a heat exchanger that generates cold, whereas the condenser (5) is a heat exchanger that generates heat, and the compressor (4) is a motor that generates heat as well. Therefore, the body (2) is made of heat-insulating material, and a cold zone insulated from the outside is generated inside the body (2).

[0008] Figs. 3A, 3B and 3C illustrate the specific case where the cassette unit (100) is to be installed on a roof of a refrigerated display cabinet. In such a case, an air intake opening (10) and an air delivery opening (11) are machined into the basement (1) under the body (2) and are interfaced with an interface of the refrigerated display cabinet to allow a flow of cold air inside the refrigerated display cabinet.

[0009] The cassette units that are to be installed in a basement or on the side of a refrigerated display cabinet have a different structure from that shown in Figs. 3A, 3B and 3C. In each case such cassette units have a body that defines a compartment wherein the evaporator is arranged. Therefore, if the cassette unit is to be installed in a basement of a refrigerated display cabinet, the air intake opening and the air delivery opening will be machined on an upper wall of the body. Conversely, if the cassette unit is to be installed on the side of a refrigerated display cabinet, the air intake opening and the air delivery opening will be machined on a side wall of the body.

[0010] In the cassette units operating at low temperature ($T < 0^{\circ}\text{C}$), ice is formed on the surface of the evaporator (3) due to the defrost deposit generated by the moisture of the treated air. The ice on the surface of the evaporator acts as a thermal insulator, resulting in an efficiency loss in the heat exchange between the air and the evaporator. Therefore, the ice formed on the evaporator must be removed by means of a defrost system that performs a defrost cycle.

[0011] Such a defrost cycle can be performed according to different techniques:

- by stopping the compressor (4);
- by means of a heating element mounted on the evaporator (3);
- by using a hot gas (the hot gas from the compression of the refrigerant performed by the compressor (4) is sent to the evaporator (3)); and
- by reversing the cycle (the refrigeration cycle is reversed so that the evaporator (3) becomes a condenser and the condenser (5) becomes an evaporator).

[0012] The choice of one of the systems depends on several factors and variables, such as defrosting speed, energy consumption, and cost.

[0013] In the case of defrosting with a hot gas, the ice deposited on the surface of the evaporator is dissolved

in water by the heat brought to the evaporator by the overheated refrigerant.

[0014] Fig. 4 illustrates an assembly comprising an evaporator (3) and a drip tray (6) arranged under the evaporator to collect the liquid obtained from the defrosting of the evaporator. The drip tray (6) has a drain conduit (60) to discharge the defrost liquid that drips onto the drip tray. The drain conduit (60) has an outlet (61) from which the defrost water flows out and falls into a collection tank outside the compartment of the body (2).

[0015] The evaporator (3) is a heat exchanger, generally of finned pack type, comprising a plurality of plates (fins) (3) arranged parallel to each other and serpentine conduits (31) running through the plates (30). The refrigerant flows inside the conduits (31), generating a heat exchange with the plates (30).

[0016] In order to eliminate the defrosting water deposited on the drip tray (6) during defrosting, the drip tray (6) is put in communication with a hot zone of the cassette unit via the drain conduit (60), in the vicinity of the condenser (5), outside the body (2).

[0017] With reference to Figs. 5, 5A and 5B, the drain conduit (60) of the drip tray (6) communicates with a collection tank (7) arranged outside the body (2), in the basement, in the vicinity of the compressor (4) and the evaporator (5) in order to collect the defrost liquid. In this way, the water accumulated in the collection tank (7) will be eliminated by natural evaporation due to the combined effect of the positive temperature caused by the heat produced by the condenser (5) and of a forced ventilation obtained by means of a fan (50) arranged in the vicinity of the condenser (5) to increase the heat exchange between the condenser and the ambient air.

[0018] However, it should be considered that as a result of the forced ventilation of the fan (50) of the condenser, a pressure zone is generated on the collection tank (7). Therefore, the hot air pushed by the fan (50) on the collection tank can rise through the drain conduit (60) of the drip tray, entering the compartment defined by the body (2) in the cold zone of the evaporator (3), as shown in Fig. 5A.

[0019] Such a negative air entrance phenomenon results in an efficiency loss at the evaporator (3) and in the formation of ice on the cold surfaces (temperature below 0 °C) of the evaporator due to the presence of moisture in the warm air entering the compartment defined by the body (2). This results in an additional efficiency loss of the cassette unit, since the ice acts as an insulator between the evaporator (3) and the air to be cooled.

[0020] US2007/214823A1 describes a heat exchanging device for refrigerator according to the preamble of claim 1.

[0021] DE102009028775A1 describes a refrigeration appliance having a defrost water channel through which defrost water can be discharged into an evaporation tray and a siphon in the passage between the defrost water channel and the evaporation tray.

[0022] WO2009/141117A1 describes a cold appli-

ance.

[0023] DE29820730U1 describes an evaporation tray of a refrigeration unit.

[0024] The purpose of the present invention is to eliminate the drawbacks of the prior art by providing a cassette unit that is capable of preventing the entrance of hot air in the compartment wherein the evaporator is arranged.

[0025] Another purpose of the present invention is to provide such a cassette unit that is efficient, reliable, versatile, and space-saving.

[0026] These purposes are achieved in accordance with the invention with the features of the appended independent claim 1.

[0027] Advantageous achievements of the invention appear from the dependent claims.

[0028] The cassette unit according to the invention is defined by claim 1.

[0029] The cassette unit according to the invention is capable of preventing the passage of air through the communication channel between the drip tray of the evaporator arranged in the cold zone in the body, and the condensate collection tank arranged in the hot zone outside the body. Such a system avoids the use of particularly sophisticated technologies (e.g., evaporation coil in the collection tank) and allows to discharge the defrost water from the drip tray to the collection tank arranged below the condenser, preventing a return of moist air from the outside to the interior of the body compartment.

[0030] Further features of the invention will become clearer from the following detailed description, referring to a purely illustrative and therefore non-limiting form of its embodiment, illustrated in the appended drawings, wherein:

Fig. 1 is a diagrammatic perspective view of a refrigerated display cabinet according to the prior art;
Figs. 2A, 2B and 2C are three diagrammatic perspective views of cassette units respectively for installation on a roof, in a basement and on a side of a refrigerated display cabinet;
Figs. 3A, 3B and 3C are exploded perspective views of the cassette unit of Fig. 2A;
Fig. 4 is a perspective view of an assembly comprising an evaporator and a drip tray according to the prior art;
Fig. 5 is a sectional view of a cassette unit according to the prior art;
Fig. 5A is an enlarged detail of Fig. 5, showing an air flow from the collection tank to the drip tray;
Fig. 5B is a perspective view of a cassette unit showing the drip tray and the collection tank;
Fig. 6 is a sectional view of a cassette unit according to the invention;
Fig. 6A is an enlarged detail of Fig. 6 showing a defrost water flow from the drip tray to the collection tank;
Fig. 7 is a perspective view of a cassette unit accord-

ing to the invention, partially cut to show a section of the drip tray and of the collection tank;
Fig. 7A is an enlarged detail of Fig. 7; and
Fig. 7B is an enlarged detail of Fig. 7A.

[0031] In the following description, elements that are identical or corresponding to those that have been already described will be indicated with the same reference numerals, omitting a detailed description.

[0032] The cassette unit (100) according to the invention is substantially similar to the one shown in Figs. 3A, 3B and 3C.

[0033] The cassette unit (100) comprises:

- a basement (1),
- a body (2) defining a compartment wherein an evaporator (3) is arranged,
- a compressor (4) and a condenser (5) arranged on the basement (1) outside the body (2),
- an air intake opening (10) and an air delivery opening (11) in communication with the compartment defined by the body (2) and suitable for being interfaced with an interface of a refrigerated display cabinet in order to allow a flow of cold air inside the refrigerated display cabinet.

[0034] The evaporator (3) of the cassette unit is substantially similar to the one shown in Fig. 4.

[0035] The cassette unit (100) has a defrost system of the evaporator (3) of known type, as described above.

[0036] Therefore the cassette unit (100) has a drip tray (6) disposed under the evaporator (3) to receive the defrost water dripping from the evaporator (3). The drip tray (6) is disposed at a higher height than the collection tank (7) to let the water flow from the drip tray to the collection tank.

[0037] With reference to Figs. 6, 6A, 6B, 7 and 7A, the collection tank (7) of the defrost water, which is disposed under the condenser (5), comprises two reservoirs: a first reservoir (70) under the outlet (61) of the drain conduit (60) of the drip tray, and a second reservoir (71) in overflow communication with the first reservoir (70).

[0038] Referring to Fig. 7A, the overflow between the first reservoir (70) and the second reservoir (71) can be achieved by means of a partition wall (72) that is bypassed by the water that fills the first reservoir (70) and overflows into the second reservoir (71). Evidently, in an equivalent way, the communication between the first reservoir and the second reservoir can be achieved by means of an overflow hole on the partition wall (72) at a distance from the bottom of the first reservoir.

[0039] The first reservoir (70) is smaller than the second reservoir (71). The first reservoir (70) extends only in correspondence with the outlet (61) of the drain conduit of the drip tray. The second reservoir (71) extends outside the body (2), under the condenser (5). The second reservoir (71) has the shape of a rectangular tray. The first reservoir (70) is disposed side by side with the second

reservoir (71) towards the body (2).

[0040] The first reservoir (70) is always filled with water for several reasons:

- the first reservoir (70) is located at the outlet (61) of the drain conduit (60) of the drip tray, sufficiently far from the hot zone where the condenser (5) is located and from the fan (50) of the condenser,
- the first reservoir (70) has a smaller area compared with the second reservoir (71) so it experiences a reduced evaporation effect, and
- the first reservoir (70) is in overflow communication with the second reservoir (71) so that it has a significant water depth.

[0041] Siphon means (9) are provided between the drain conduit (60) of the drip tray and the first reservoir (70). The siphon means (9) allow the water to flow from the drain conduit (60) of the drip tray to the first reservoir (70), whereas they prevent a passage of air from outside the body (2) through the first reservoir (70). Therefore, the water in the first reservoir (70) prevents the entrance of humid air from the outside towards the drain conduit (60) of the drip tray and therefore towards the evaporator (3).

[0042] With reference to Figs. 6A and 6B, said siphon means (9) can be obtained by means of a partition wall (25) that protrudes inferiorly from a side wall (26) of the body (2) and is immersed in the liquid of the first reservoir (70), without touching the bottom of the first reservoir, whereby a slot (25a) is generated between the lower edge of the partition wall (25) and the bottom of the first reservoir (70).

[0043] In this way, the first reservoir (70) is divided into a first chamber (70a) and a second chamber (70b) in communication with each other through the slot (25a) below the partition wall (25). The first chamber (70a) is located in the compartment of the body. The second chamber (70b) is in communication with the outside of the body.

[0044] The siphon means (9) are provided between the first chamber (70a) and the second chamber (70b) of the first reservoir and are configured to allow a water flow from the first chamber (70a) of the first reservoir to the second chamber (70b) of the first reservoir and prevent a passage of air from the outside of the body (2) through the second chamber (70b) of the first reservoir.

[0045] Since the first reservoir (70) is constantly filled with water and the partition wall (25) is always immersed in the water of the first reservoir, there will always be water in the first chamber (70a) and in the second chamber (7b) preventing the passage of air from the outside of the body (2) to the interior of the body.

[0046] Thus, the first reservoir (70) operates as a hydraulic siphon that maintains a constant filling level of the first reservoir and thus prevents the entrance of moist air from the outside towards the interior of the body, given that the partition wall (25) is always immersed.

[0047] According to the solution shown in Figs. 6 and 7, the siphon means (9) comprise the partition wall (25) of the side wall of the body that is immersed in the liquid of the first reservoir (70).

[0048] Advantageously, a one-way valve (8) is arranged in the first reservoir (70) so as to allow a passage of liquid from the drip tray (6) to the collection tank (7) and prevent a passage of air from the collection tank (7) to the drip tray (6). The one-way valve (8) acts as a safety system, in case the first reservoir (70) is completely emptied of water.

[0049] The one-way valve (8) may comprise a floating wing (80).

[0050] In the embodiment shown in Fig. 6B, the floating wing (80) is arranged between the bottom of the first reservoir (70) and the partition wall (25) of the side wall (26) of the body to allow a passage of water from the first chamber (70a) to the second chamber (70b) of the first reservoir and prevent a passage of air from the second chamber (70b) to the first chamber (70a) of the first reservoir.

[0051] The floating wing (80) can be attached to the bottom of the first reservoir (70). When the first reservoir is empty and a flow of pressurized air is generated from the collection tank (7) towards the drip tray (6), the floating wing (80) is lifted by the air and goes in contact with the partition wall (25), blocking the passage of air. In contrast, when a liquid flow is generated from the drip tray (6) to the collection tank (7), said liquid flow compresses the floating wing (80) toward the bottom of the first reservoir, allowing the liquid to flow from the drip tray (6) to the collection tank (7).

[0052] The floating wing (80) can be attached to the outlet (61) of the drain conduit. In such a case, the floating wing normally closes the outlet (61) of the drain conduit to prevent the passage of air in the drain conduit. When the water flows in the drain conduit (60), the water flow pushes the diaphragm (8), which opens the outlet (61) to let the water flow out.

[0053] Equivalent variations and modifications may be made to the present embodiments of the invention, within the reach of a person skilled in the art, but still within the scope of the invention as expressed by the appended claims.

Claims

1. Cassette unit (100) comprising:

- a basement (1),
- a body (2) defining a compartment wherein an evaporator (3) is arranged,
- a compressor (4) and a condenser (5) arranged on the basement (1) outside the body (2),
- an air intake opening (10) and an air delivery opening (11) in communication with the compartment defined by the body (2) and suitable

for being interfaced with an interface of a refrigerated display cabinet in order to allow a flow of cold air inside the refrigerated display cabinet,

- a defrost system suitable for performing a defrost cycle wherein the evaporator (3) is heated in order to melt the ice that is formed on the evaporator,

- a drip tray (6) disposed under the evaporator (3) to receive the defrost water dripping from the evaporator (3) during the defrost cycle, and
- a collection tank (7) disposed outside the body (2) in the area of the basement (1) in the vicinity of the compressor (4) and the evaporator (5) and in communication with the drip tray (6) in order to collect the defrost water;

characterized by the fact that

said collection tank (7) comprises two reservoirs: a first reservoir (70) disposed under an outlet (61) of a drain conduit (60) of the drip tray, and a second reservoir (71) in overflow communication with the first reservoir (70); and

said cassette unit (100) comprises siphon means (9) comprising a partition (25) that protrudes inferiorly from a side wall (26) of the body and is immersed in a liquid of the first reservoir (70), without touching the bottom of the first reservoir, in such a way that the first reservoir (70) is divided into a first chamber (70a) and a second chamber (70b) communicating with each other through a slot (25a) disposed under the partition (25); wherein the first chamber (70a) is disposed in the compartment of the body (2) under the outlet (61) of the drain conduit (60) of the drip tray (6) and the second chamber (70b) is in communication with the outside of the body (2); said siphon means (9) being provided between the first chamber (70a) and the second chamber (70b) of the first reservoir and being configured in such a way to allow water to flow from first chamber (70a) of the first reservoir to the second chamber (70b) of the first reservoir, preventing a passage of air from outside the body (2) through the second chamber (70b) of first reservoir (70).

2. The cassette unit (100) according to claim 1, wherein said first reservoir (70) is smaller than the second reservoir (71) and extends only in correspondence with the outlet (61) of the drain conduit of the drip tray.

3. The cassette unit (100) according to claim 2, wherein said second reservoir (71) extends outside the body (2), under the condenser (5) in the area of the basement (1).

4. The cassette unit (100) according to claim 2, wherein said second reservoir (71) extends outside the body (2), under the basement (1).

5. The cassette unit (100) according to any one of the preceding claims, wherein the second reservoir (71) has the shape of a rectangular tray and the first reservoir (70) is disposed side by side with the second reservoir (71) and extends towards the body (2). 5
6. The cassette unit (100) according to anyone of the preceding claims, wherein said drain conduit (60) is shaped like a channel and is disposed in the compartment of the body. 10
7. The cassette unit (100) according to any one of the preceding claims, comprising a one-way valve (8) disposed in the first reservoir (70) in such a way to allow a passage of liquid from the drip tray (6) towards the collection tank (7) and prevent a passage of air from the collection tank (7) towards the drip tray (6). 15
8. The cassette unit (100) according to claim 7, wherein said one-way valve (8) comprises a floating wing (80). 20
9. The cassette unit (100) according to any one of the preceding claims, wherein the drip tray (6) is disposed at a higher height than the collection tank (7). 25

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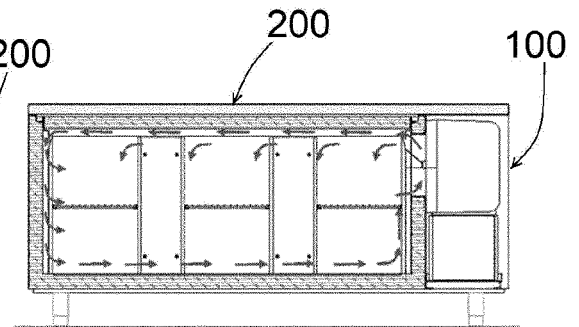
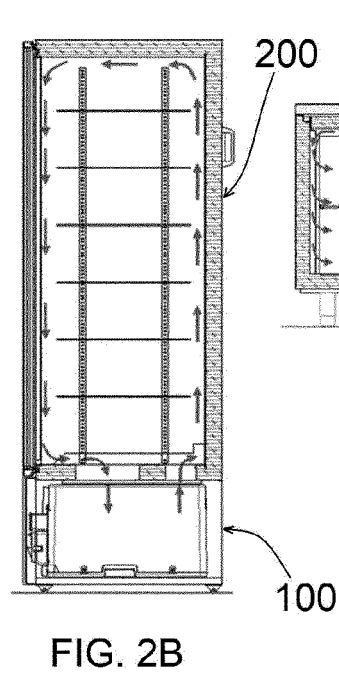
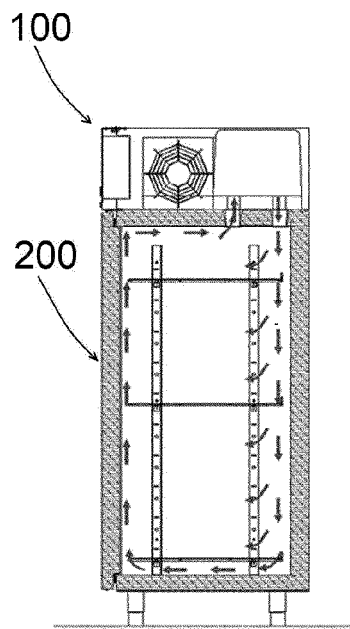
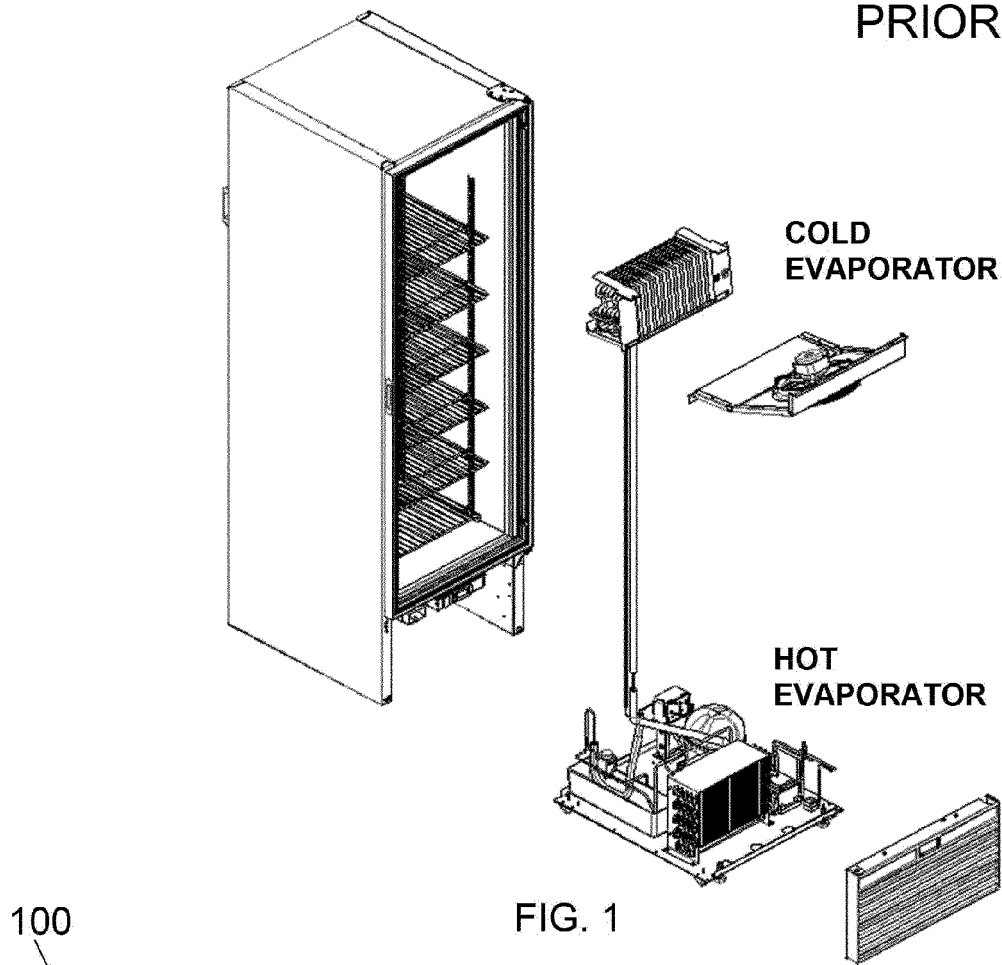
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PRIOR ART



PRIOR ART

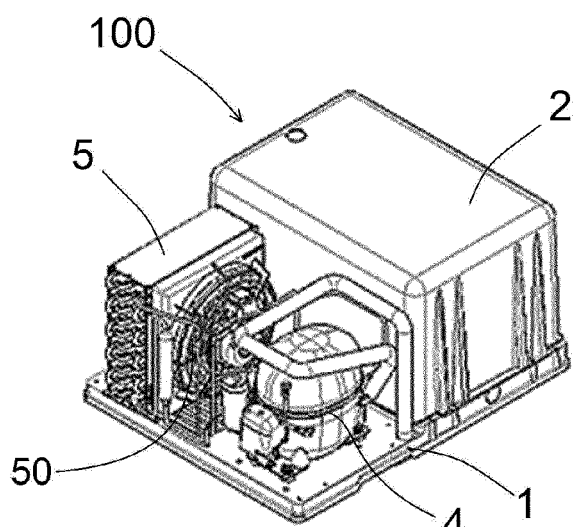


FIG. 3A

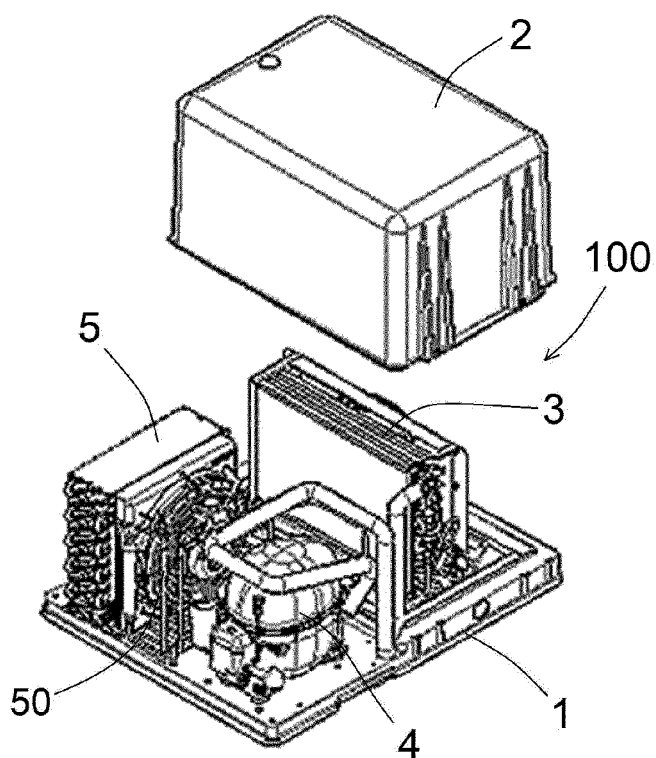


FIG. 3B

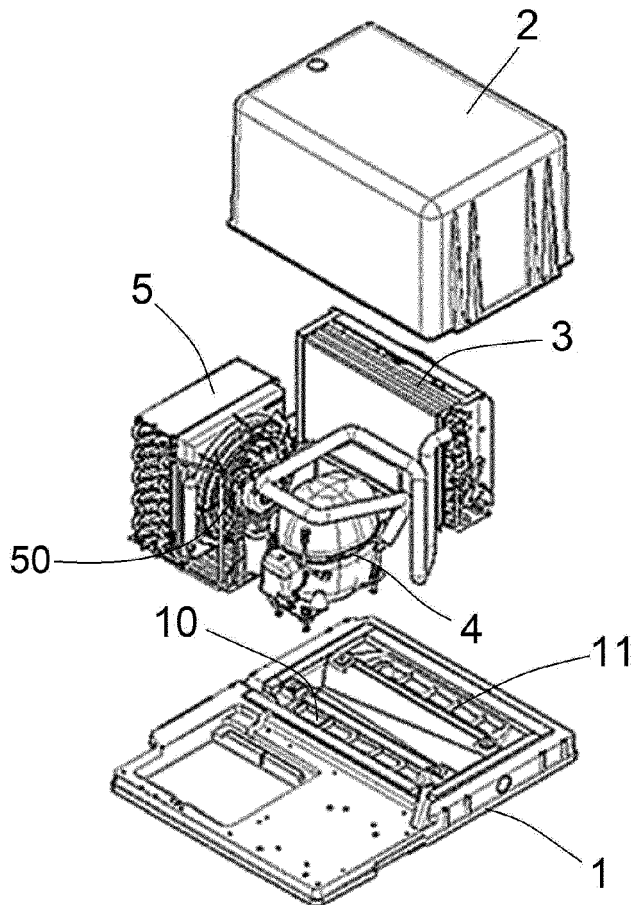


FIG. 3C

PRIOR ART

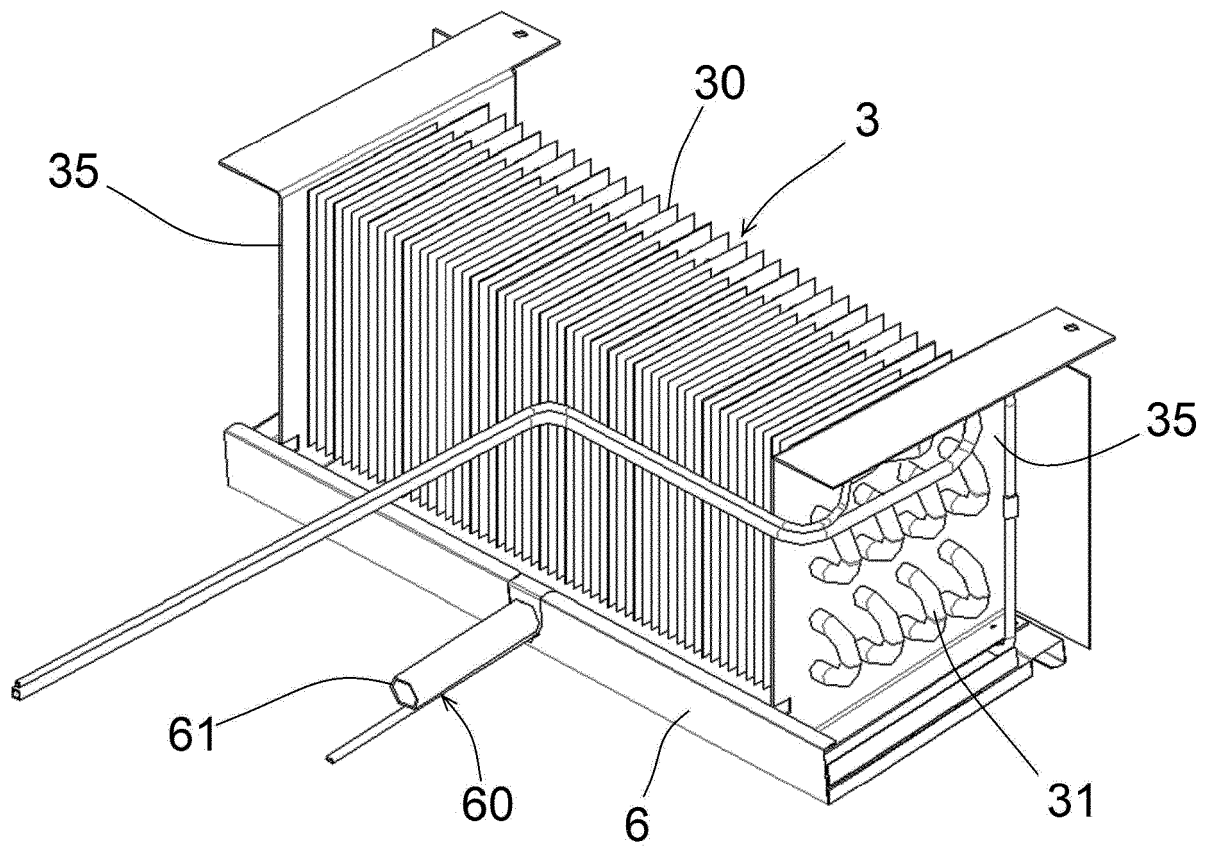
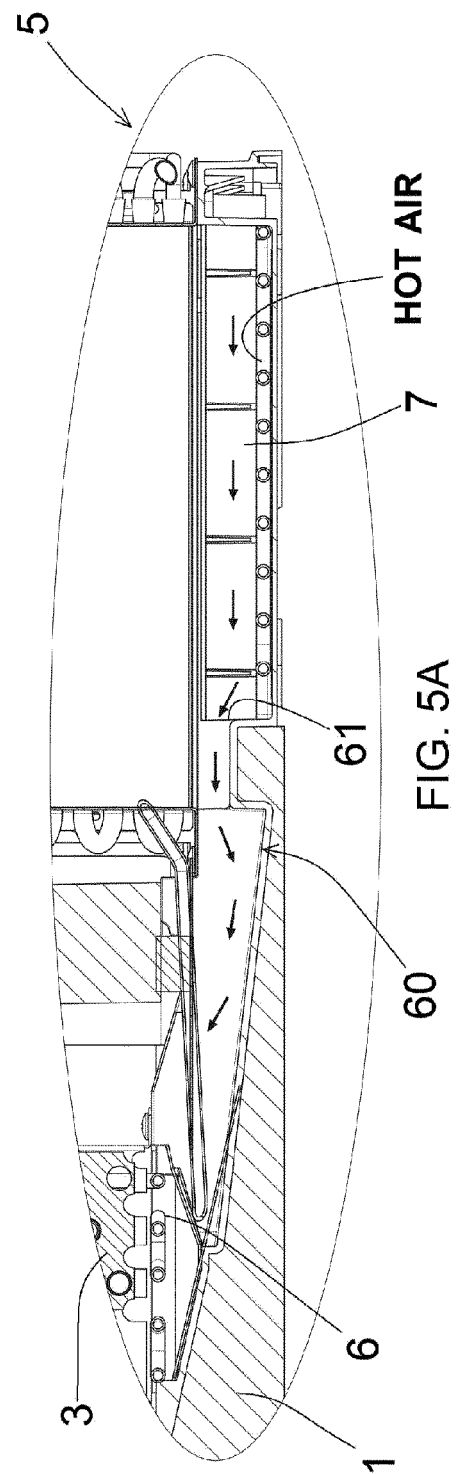
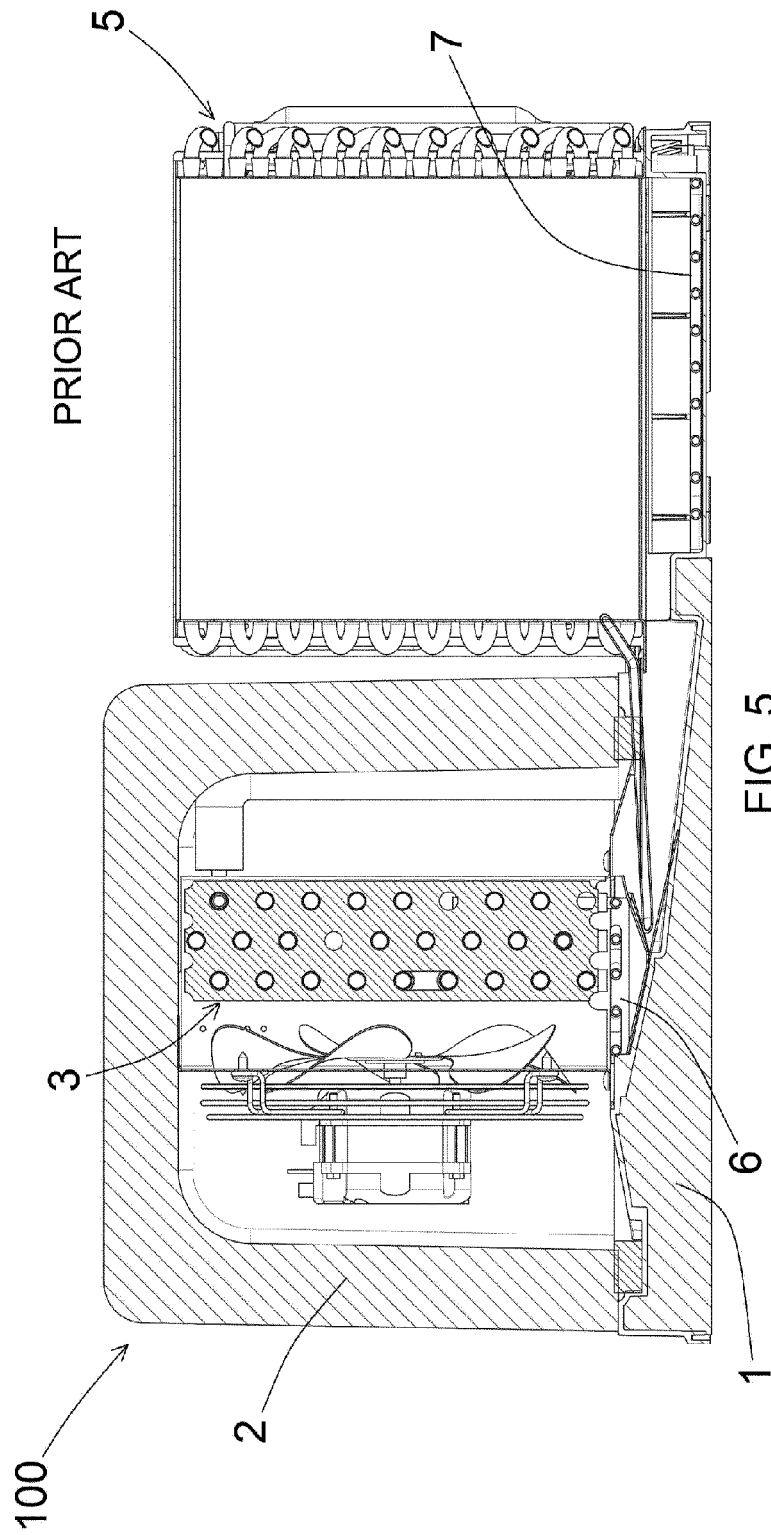


FIG. 4



PRIOR ART

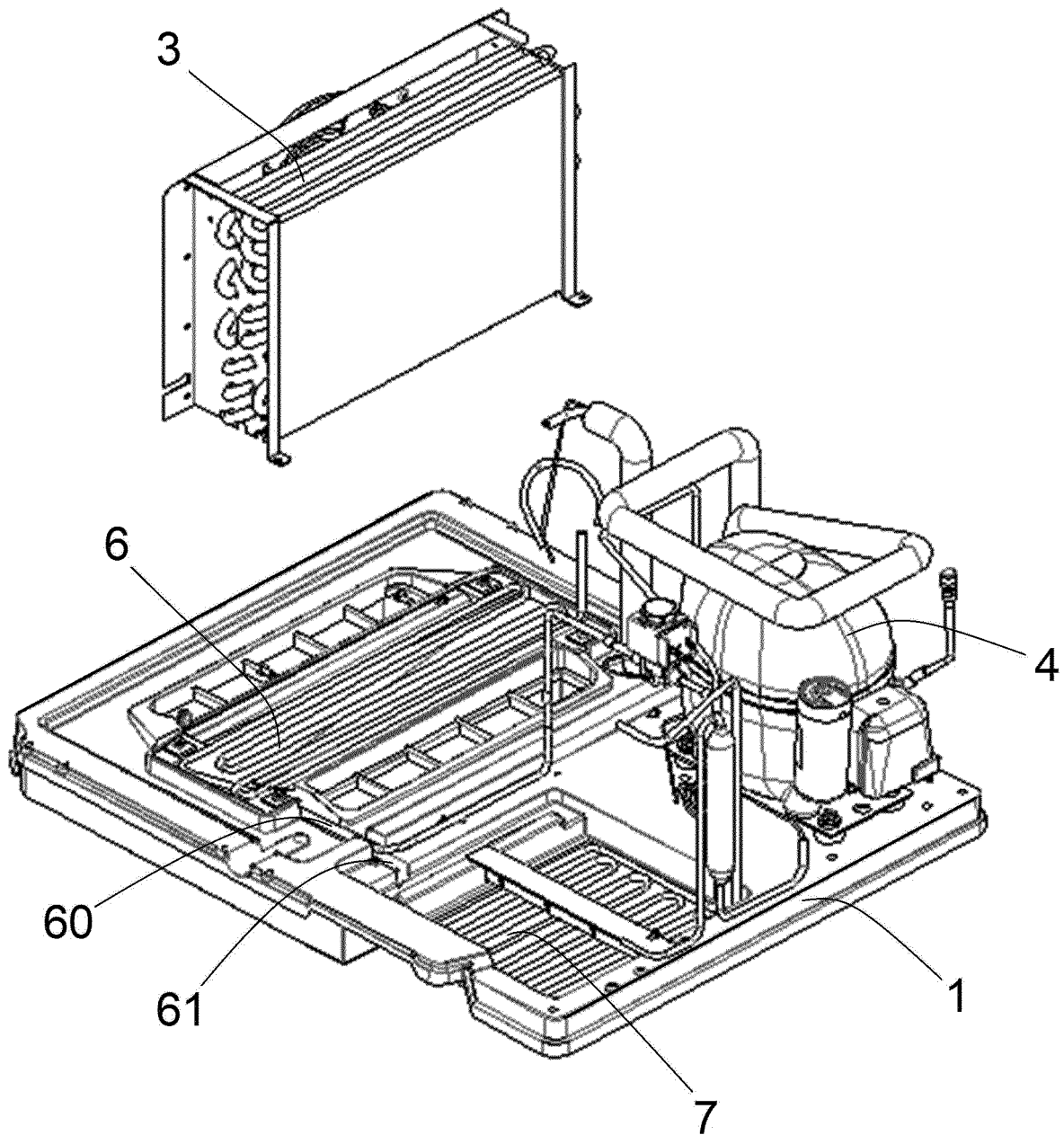
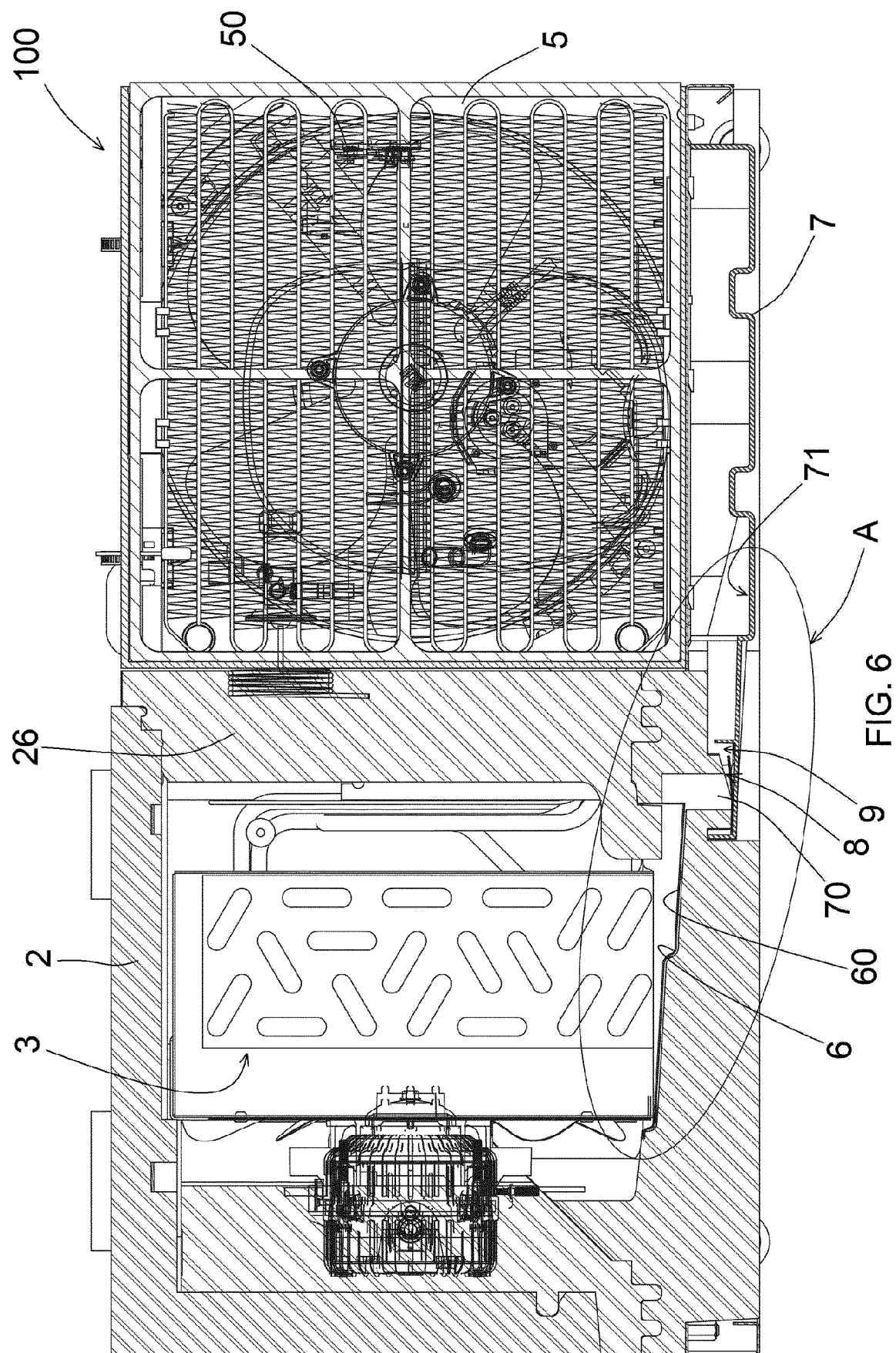


FIG. 5B



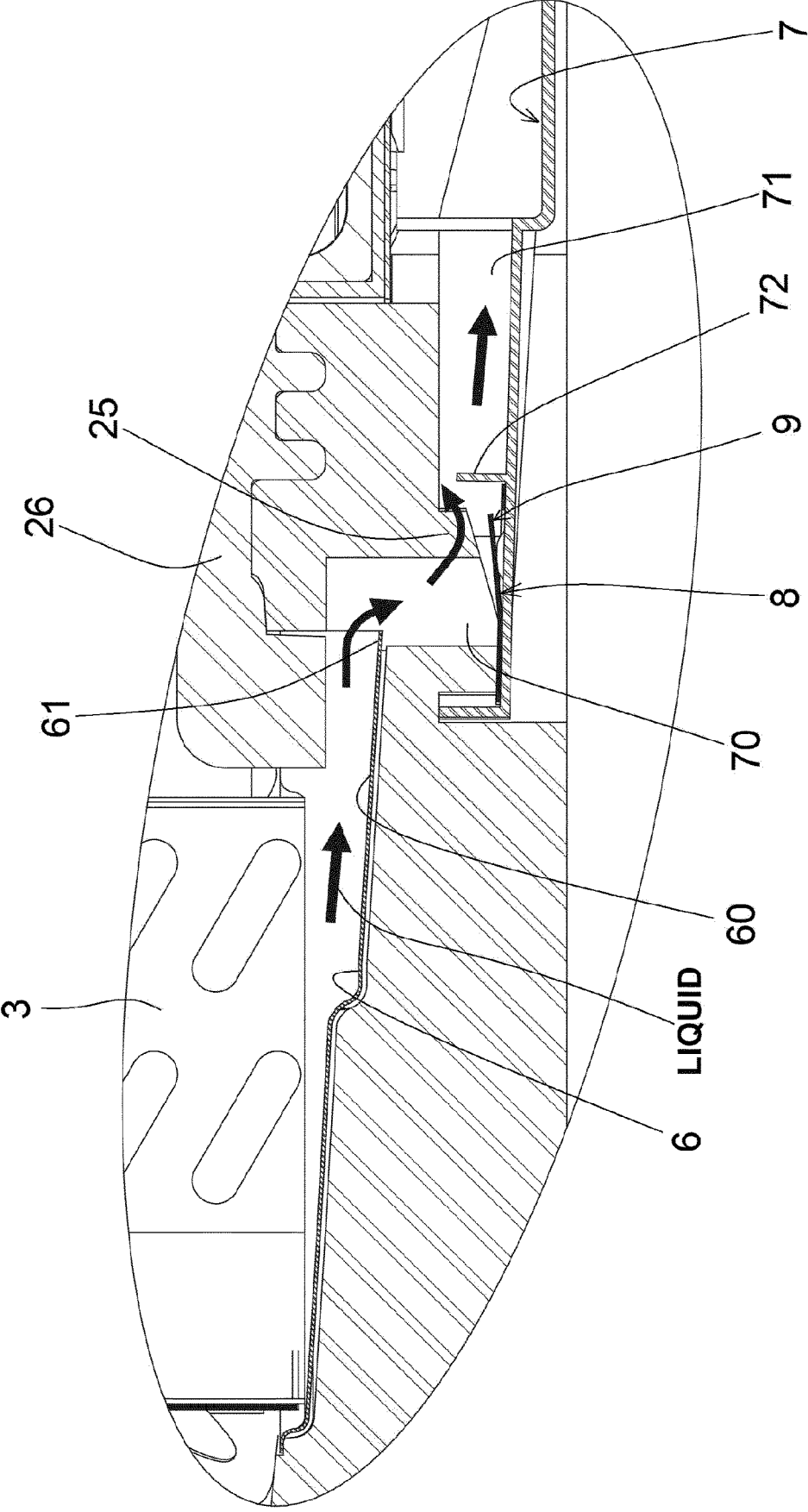


FIG. 6A

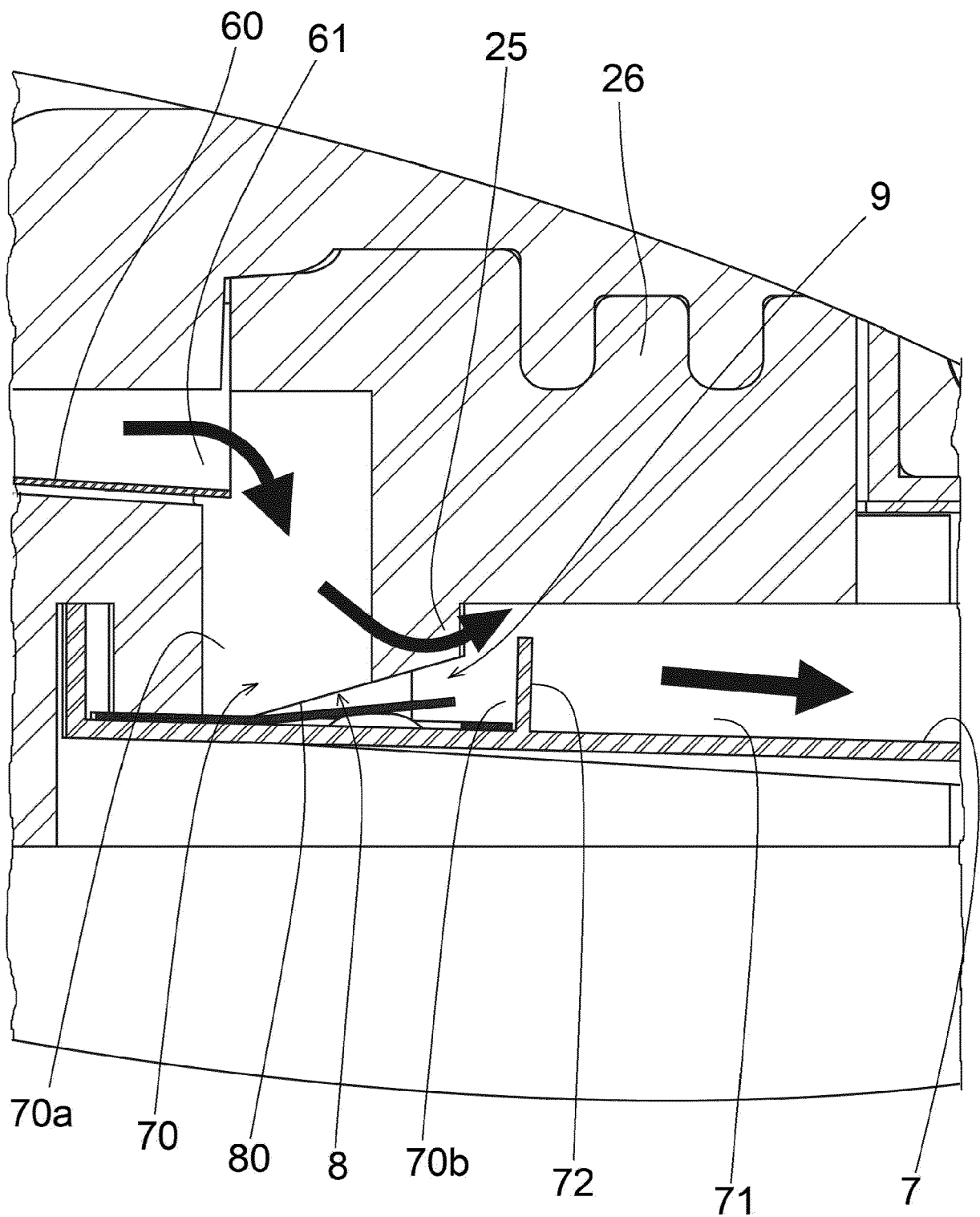


FIG. 6B

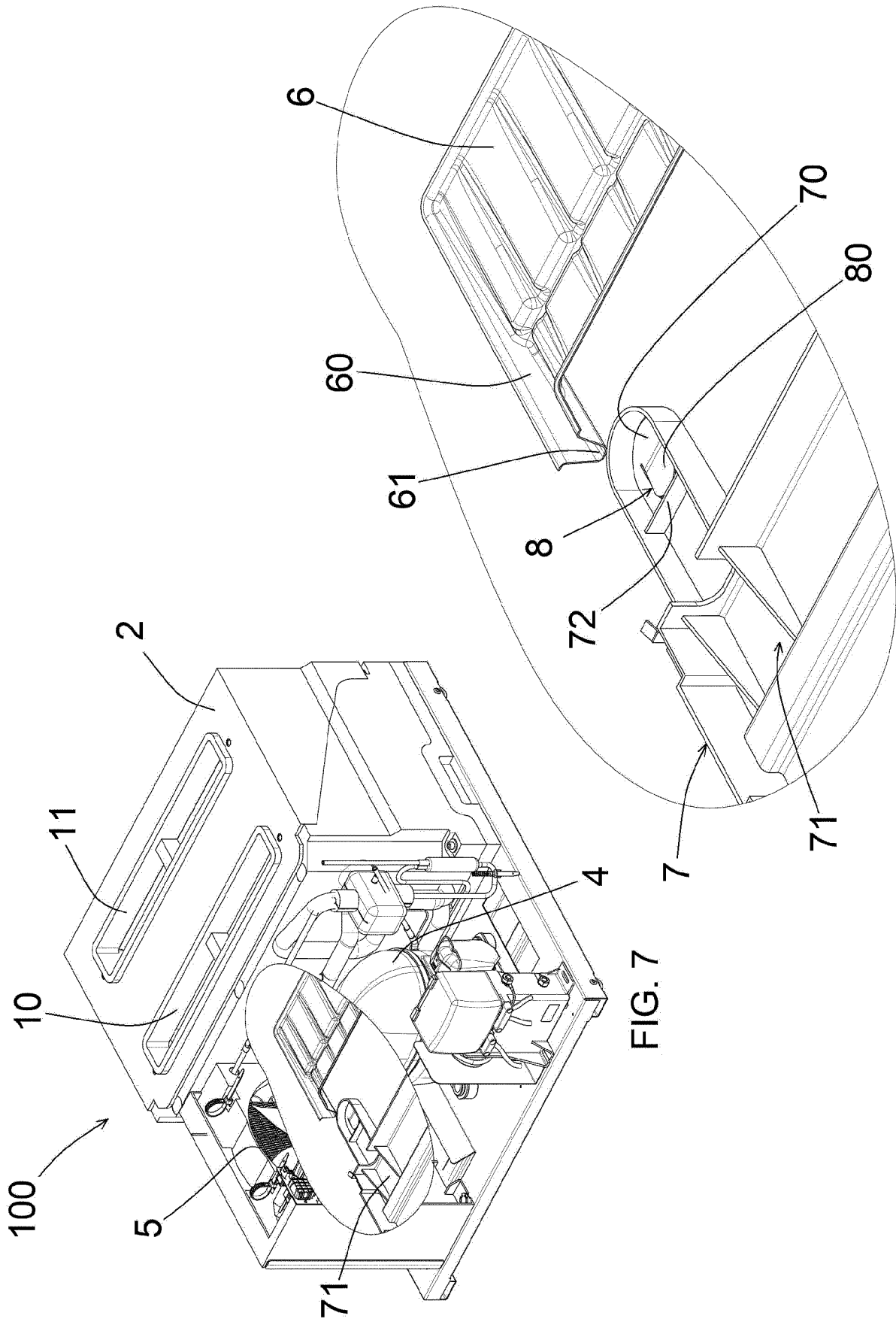


FIG. 7A

FIG. 7



EUROPEAN SEARCH REPORT

Application Number

EP 23 16 1923

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,D	US 2007/214823 A1 (PARK JONG-JIN [KR]) 20 September 2007 (2007-09-20) * the whole document *	1-9	INV. F25D21/14 F25D19/02
A,D	DE 10 2009 028775 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 24 February 2011 (2011-02-24) * the whole document *	1-9	
A,D	WO 2009/141117 A1 (ELECTROLUX AB [SE]; ANDERSSON BERNT [SE]; ANDERSSON KLAS [SE]) 26 November 2009 (2009-11-26) * the whole document *	1-9	
A,D	DE 298 20 730 U1 (LIEBHERR HAUSGERAETE [DE]) 6 May 1999 (1999-05-06) * the whole document *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			F25D F25B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		7 July 2023	Kolev, Ivelin
CATEGORY OF CITED DOCUMENTS		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	
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 16 1923

5

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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25

30

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007214823 A1	20-09-2007	CN 101038113 A	19-09-2007
		KR 20070093634 A	19-09-2007
		US 2007214823 A1	20-09-2007
DE 102009028775 A1	24-02-2011	DE 102009028775 A1	24-02-2011
		EP 2467656 A1	27-06-2012
		PL 2467656 T3	30-04-2018
		WO 2011020801 A1	24-02-2011
WO 2009141117 A1	26-11-2009	AU 2009250065 A1	26-11-2009
		BR PI0912966 A2	13-10-2015
		CN 102037297 A	27-04-2011
		EP 2300759 A1	30-03-2011
		KR 20110021923 A	04-03-2011
		US 2011179817 A1	28-07-2011
		WO 2009141117 A1	26-11-2009
DE 29820730 U1	06-05-1999	AT 237787 T	15-05-2003
		DE 29820730 U1	06-05-1999
		EP 1003004 A1	24-05-2000
		ES 2197561 T3	01-01-2004

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2007214823 A1 **[0020]**
- DE 102009028775 A1 **[0021]**
- WO 2009141117 A1 **[0022]**
- DE 29820730 U1 **[0023]**