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Datasheet for the decision of 9 December 2014

Case Number: T 0931/11 - 3.2.03

Application Number: 02028338.8

Publication Number: 1321729

IPC: F25B39/04, F25B43/00, B60H1/32

Language of the proceedings: EN

Title of invention:
Refrigeration cycle and method for determining capacity of receiver thereof

Patent Proprietor:
Halla Climate Control Corporation

Opponent:
Behr GmbH & Co. KG

Headword:

Relevant legal provisions:
EPC Art. 123(2)

Keyword:
Amendments - added subject-matter (yes)

Decisions cited:

Catchword:

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Case Number: T 0931/11 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 9 December 2014

Appellant: (Opponent)	Behr GmbH & Co. KG Intellectual Property, G-IP Mauserstrasse 3 70469 Stuttgart (DE)
Representative:	Grauel, Andreas Grauel IP Patentanwaltskanzlei Presselstrasse 10 70191 Stuttgart (DE)
Respondent: (Patent Proprietor)	Halla Climate Control Corporation 1689-1 Sinil-Dong, Daedeok-gu Daejeon-si 306-230 (KR)
Representative:	Wood, Graham Bailey Walsh & Co LLP 1 York Place Leeds, LS1 2DR (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 16 February 2011 concerning maintenance of the European Patent No. 1321729 in amended form.**

Composition of the Board:

Chairman	G. Ashley
Members:	C. Donnelly
	M. Blasi

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division dated 16 February 2011 concluding that European Patent No. EP-B-1321729 could be maintained in amended form.

II. The opponent (hereinafter: the "appellant") filed notice of appeal against this decision in due form and time. The patent proprietor (hereinafter: the "respondent") answered the objections raised in the appeal by letter of 24 October 2011.

III. In a communication pursuant to Article 15(1) RPBA, annexed to the summons to oral proceedings, the Board informed the parties of its provisional opinion.

IV. Oral proceedings were held on 9 December 2014. At the conclusion of the debate the parties confirmed the following requests:

- The appellant (opponent) requested that the contested decision be set aside and that the European patent No. 1321729 be revoked.

- The respondent (patent proprietor) requested that the appeal be dismissed, i. e. that the patent be maintained in amended form on the basis of the set of claims considered allowable by the opposition division in the decision under appeal (main request), or alternatively, that the patent by maintained in amended form on the basis of the set of claims filed as auxiliary requests 1 or 2 on 23 December 2010.

V. Independent claim 1 as considered allowable by the opposition division reads:

"A refrigeration cycle comprising a compressor (200), a condenser (300), a receiver (400), an expansion valve (500), an evaporator (600) said condenser (300) which is used is a receiver integrated sub-cool condenser in which there is provided a subcool area for supercooling the refrigerant passed from the receiver (400), characterized in that
the capacity of said condenser (300) is represented by CVT and the capacity of said receiver (400) is represented by RV and the relational expression of $29.71 \times \ln(CVT)+35 \leq RV \leq 41.103 \times \ln(CVT)+74.3$ is satisfied wherein $220cc \leq RV \leq 350cc$."

Independent claim 7 as considered allowable by the opposition division reads:

"A method for determining a capacity of a receiver in a refrigeration cycle that has a compressor (200), a condenser (300), a receiver (400), an expansion valve (500) and an evaporator (600), and the condenser (300) used is a receiver integrated sub-cool condenser and the refrigerant is passed from the receiver (400) to a sub-cool area of the sub-cool condenser to supercool the refrigerant and
characterised in that
the capacity of said condenser (300) is represented by CVT and the capacity of said receiver (400) is represented by RV, and the relational expression of $29.71 \times \ln(CVT)+35 \leq RV \leq 41.103 \times \ln(CVT)+74.3$ is satisfied."

VI. In independent claims 1 and 7 of auxiliary request 1 the terms "sub-cool" and "subcool" used in claim 1 as considered allowable by the opposition division are replaced with the term "supercooling".

In auxiliary request 2 the relational expression specifying 220cc≤RV≤350cc is also added to independent method claim 7.

VII. The arguments of the parties relevant for the decision can be summarised as follows:

a) Appellant

Main request, Article 123(2) EPC

The amendment to claim 1, according to which:

"the condenser which is used is a receiver integrated sub-cool condenser in which there is provided a subcool area for supercooling the refrigerant passed from the receiver"

is not explicitly disclosed in the application as originally filed, and hence is contrary to Article 123(2) EPC.

The embodiment according to figure 2 shows a condenser arrangement wherein the receiver is downstream of the condenser (so is not integrated into the condenser), and the arrangement of figure 4 does not have a receiver, thus these embodiments cannot support the amendment.

Although figure 3 shows a condenser with an integrated receiver, the location and extent of a specific subcool area is not clearly and unambiguously recognisable.

Figure 3 shows a highly specific embodiment, where the receiver is provided with desiccant 410 and a lower cap. It is obvious that these features are inextricably linked to the receiver volume since they take up space within the receiver and determine its effective capacity.

It is thus not directly and unambiguously derivable that the equation defined in claim 1 applies to the embodiment of figure 3 when it is operated with a significant subcool area, since, in contrast to the prior art described in paragraphs [0002] and [0003], the claimed relationship takes no account of the effect of the amount of subcooled liquid and the presence of the desiccant and lower cap. The failure to define these features in the claim results in a broadening of the scope of the claimed subject-matter contrary to Article 123(2) EPC.

Auxiliary requests

The same arguments apply to the auxiliary requests.

b) *Respondent*

Main request, Article 123(2) EPC

The disputed feature is disclosed by the combination of figure 3 and paragraph [0036] of the application as originally filed and published as EP 1 321 729 A2.

Paragraph [0036] of the application states that figure 3, which clearly shows an integrated receiver, represents an embodiment of the condenser in which the principles of the invention are applied. These principles are set out in the description, and include the combination of a subcooling condenser to receive refrigerant from the receiver in accordance with the relationship set out in claim 1.

Paragraphs [0002] and [0003] of the application as published, entitled the "Background of the Related Art", concern "one of the conventional refrigeration cycles" and explicitly mention a supercooling device. Since the invention takes a conventional supercooling device as its starting point, there is no doubt that it must also relate to a sub-cool condenser.

There is no reason why the specific location of the sub/super cool area and/or provision of desiccant and/or provision of a cap should be considered as key features of the invention. Thus, they need not be included in the claim, since they have no bearing on the invention or the performance of the invention. Accordingly, the relationship defined in claim 1 is applicable to the embodiment of figure 3 without the presence of desiccant or the lower cap in the receiver.

Reasons for the Decision

1. Main request, Article 123(2) EPC

1.1 Claim 1, as considered to be allowable by the opposition division, had been amended during examination proceedings to include the feature: "said condenser which is used is a receiver integrated sub-cool condenser in which there is provided a subcool area for supercooling the refrigerant passed from the receiver (400)".

1.2 An explicit reference to a receiver integrated sub-cool condenser or a sub-cool area for supercooling the refrigerant is not made at any point in the application as originally filed. Figure 2 shows an embodiment in which the receiver is separate from the condenser and in the arrangement of figure 4 no receiver is shown; although one is mentioned in the corresponding part of the description at paragraph [0038], there is no indication where this might be located.

1.3 Concerning paragraph [0036] of the application, which provides a description of the embodiment of figure 3, this does not explicitly mention a sub-cool condenser or a sub-cool area, since it only states (see column 5, lines 23 to 26 of the published application) that:

"the condenser integrated with the receiver is employed such that the refrigerant discharged from the condenser 300 is maintained at the liquid phases"

Thus, this citation is itself no clear and unambiguous disclosure of a dedicated sub-cool area in the condenser, nor of how such an area is to be considered in light of the relationship defined in claim 1.

1.4 Figure 3, referred to by the respondent as an example of a receiver integrated sub-cool condenser, shows a particular embodiment of the refrigeration cycle

arrangement, in which the integrated receiver is provided with desiccant 410 and a lower cap. The Board agrees with the reasoning of the opposition division (see the contested decision, paragraph 2(a) of the Reasons) that it can be deduced from the positioning of the passageways 360, 361 and 362 between the condenser and the integrated receiver 400 that a subcool area is provided to some extent in the arrangement. However, it is not apparent that the claimed relationship applies to such a configuration. At no point in the originally filed application is the influence of the sub-cool area on the receiver capacity, or lack of it, mentioned.

1.5 By contrast, when discussing the prior art refrigeration cycle in paragraph [0003] of the published application, as argued by the respondent, the refrigerant condenser and the supercooling device are referred to, and identified as, separate components. Furthermore, the capacity (VSC) of the supercooling tube portion is treated as a distinct parameter influencing the value of V3, which in turn plays a role in the calculation of the receiver volume VR. This allows for the fact that an accumulation of fluid in the supercooling tube portion acts to supplement the function of the receiver, hence V3 has a negative value.

1.6 The skilled person is presented with the situation where the description suggests that the *principles* of the relationship defined in claim 1 apply to the arrangement shown in figure 3 (see opening sentence of paragraph [0036]), which comprises an undefined sub-cooling area, and also to the condensers of figures 2 and 4, which do not. Additionally, the skilled person's general knowledge and the background information provided in the application itself make him aware that

any sub-cooling area needs special consideration, but the description of the alleged invention itself is silent on this matter. Thus, the Board cannot agree with the opposition division's conclusion that it is obvious that the general teaching of the invention can also be applied to condensers with a sub-cooling area.

1.7 In the Board's view, to be consistent, the relationship of claim 1 must be applied in the same manner for all embodiments, and that the terminology used throughout the application be respected. This means that on the basis of the original disclosure the skilled person would come to the conclusion that, in the arrangement of figure 3, the relationship only applies to that part of the condenser arrangement where refrigerant is condensed in the same manner as shown in the embodiments according to figures 2 and 4 before being sent to the receiver.

1.8 However, the amendment introduced into present claim 1 means that the relationship has been extended contrary to Article 123(2) EPC to apply to the capacity of a condenser that includes a subcool area, since the claim defines that the capacity of said condenser (300) *in which there is provided a subcool area* is represented by CVT.

2. Auxiliary requests

2.1 Auxiliary requests 1 and 2 were effectively filed in the appeal proceedings with letter of 10 November 2014 by way of a reference to submissions filed previously in the opposition proceedings. Therefore it is necessary to examine their admissibility into the appeal proceedings under Article 13(1) RPBA.

2.2 In independent claims 1 and 7 of auxiliary request 1 the terms "sub-cool" and "subcool", as used in claim 1 of the main request, are replaced with the synonymous term "supercooling".
Claim 1 of auxiliary request 2 is the same as claim 1 of the main request.

2.3 Thus, *prima facie* neither of the auxiliary requests overcomes the objection under Article 123(2) held against the main request. Accordingly, auxiliary requests 1 and 2 are not admitted into the proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

C. Spira G. Ashley

Decision electronically authenticated