BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 17 January 2008

Case Number: T 0016/06 - 3.2.03

Application Number: 96307554.4

Publication Number: 0769666

IPC: F25B 39/04, B60H 1/32

Language of the proceedings: EN

Title of invention:
Condenser structure with a liquid tank

Patentee:
Calsonic Kansei Corporation

Opponent:
Valeo Thermique Moteur S.A.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Novelty (yes)"
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0016/06 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 17 January 2008

Appellant: (Opponent)
Valeo Thermique Moteur S.A.
8 rue Louis Lormand
F-78321 La Verrière (FR)

Representative:
Rolland, Jean-Christophe
Valeo Systemes Thermiques
Propriété Industrielle
8, rue Louis-Lormand
La Verrière
F-78321 Le Mesnil St Denis Cedex (FR)

Respondent: (Patent Proprietor)
Calsonic Kansei Corporation
24-15, Minami-dai 5-chome
Nakano-ku
Tokyo (JP)

Representative:
Finnie, Peter John
Gill Jennings & Every LLP
Broadgate House
7 Eldon Street
London EC2M 7LH (GB)

Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 4 November 2005 rejecting the opposition filed against European patent No. 0769666 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: J.-P. Seitz
Members: C. Donnelly
Y. Jest

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division, posted on 4 November 2005, to reject the opposition against European Patent No. EP-B-769666.

II. The contested patent relates to a condenser structure with a liquid tank which can be used with a vapour compressing type refrigerator for automobile air-conditioning and comprises a single independent claim which reads as follows:

"A condenser structure for a vehicle with a liquid tank comprising:
a condenser (23) including a pair of header pipes (26a,26b) spaced from each other, a plural number of heat transferring pipes (28) disposed between said pair of header pipes so as to be spaced from each other, both ends of said heat transferring pipes being opened to an inside of said header pipes, and fins (34) disposed between said adjacent heat transferring pipes spaced from each other; and
a liquid tank (24) fastened to said first header pipe (26a) so as to receive a liquid refrigerant discharged from a discharging port of said condenser, wherein said first header pipe and said liquid tank are coupled with each other detachably in such a manner that a liquid refrigerant flowing passage is formed so as to be air-tight and liquid-tight,
said condenser further including a connection block (31) fastened to an outer surface of a first end of said first header pipe (26a) and having a first discharging port and a feeding port in which said liquid refrigerant flows; and said liquid tank (24)

further including a case (35) of which a first end is closed and a second end is opened, and a mounting block (36) fastened to said connection block and fastened to said second end of said case and having a take-in port (39) and a second discharging port (40), wherein said first discharging port and said take-in port are coupled and said second discharging port and said feeding port are coupled air-tightly and liquid-tightly; wherein first and second refrigerant passages (51,52) are formed in said mounting block, each of said first and second refrigerant passages (51,52) having a horizontal hole and a vertical hole, with said first refrigerant passage (51) being communicated with said take-in port (39) and said second refrigerant passage (52) being communicated with said second discharging port (40),

characterised in that

the condenser (23) and the liquid tank (24) are coupled in series in the direction of refrigerant flow, said liquid tank (24) has removal means for removing foreign materials (20) from said liquid refrigerant, and in that each of said first and second refrigerant passages (51,52 are L-shaped."

III. The opponent (appellant) filed a notice of appeal against the impugned decision on 4 January 2006 and paid the appropriate fee the same day.

In the grounds of appeal filed on 9 March 2006 the appellant cited the following state of the art in support of his request for the revocation of the patent in its entirety:

A1 - Annexe1: JP-A-6194005;
A1'- Annexe 1': translation of A1;
A2 - Annexe 2: EP-A-0480330;
A3 - Annexe 3: JP-A-06002992;
A4 - Annexe 4: JP-A-4103973;
A5 - Annexe 5: Brochure: Automotive-dryer, Model 1982, Kenmore GmbH;
A6 - Annexe 6: US-A-5038 582;
A7 - Annexe 7: JP 4-1316667;
A8 - Annexe 8: US-A-5 685 366;
A9 - Annexe 9: US-A-4 998 580;
A10- Annexe 10: EP-A-359 358;
A11- Annexe 11: enlarged view of figures 1 and 3 of A1;
A12 - Annexe 12: US-A-4 142 843.

IV. In letter of 7 July 2006 the respondent (patentee) provided counter-arguments and requested that the appeal be dismissed. The respondent also filed a further document EP-A-669 506 (A13) which it was considered represented the most relevant state of the art.

Both parties made an auxiliary request for oral proceedings to be held.

V. The Board issued a provisional opinion in a communication pursuant to Article 11(1) RPBA annexed to the summons to oral proceedings in which it expressed doubts that A13 could be considered as the most relevant prior art. Further, the Board indicated that the subject-matter of claim 1 appeared to be new with respect to A1' and that documents A2,A4,A6,A9 and A12

seemed to be of particular relevance for the question of inventive step.

Oral proceedings were held on 17 January 2007.

VI. *Arguments of the parties*

The parties arguments can be summarised as follows:

(a) *Novelty*

(i) Appellant

The subject-matter of claim 1 as granted is not new with respect to A1 together with its translation A1'.

In particular A1 describes the following features of claim 1:

(a) -the condenser includes a pair of header pipes spaced from each other, a plural number of heat transferring pipes disposed between said pair of header pipes so as to be spaced from each other, both ends of said heat transferring pipes being opened to an inside of said header pipes, and fins disposed between said adjacent heat transferring pipes spaced from each other; and wherein
(b) -said liquid tank has removal means for removing foreign materials from said liquid refrigerant;
(c) - said condenser further including a connection block fastened to an outer surface of a first end of said first header pipe and having a first discharging

port and a feeding port in which said liquid refrigerant flows;

Feature (a)

Figures 1 and 3 of A1 show a condenser (1) in schematic form. However, the skilled person would clearly derive from these figures that the condenser includes a pair of header tanks, since although only one is shown the plural number of heat transferring pipes indicated by the thick black lines must be connected between two such tanks. The thin vertical lines between the thick black lines are accepted in the art as being the standard way of showing fins. The condenser shown cannot be of the serpentine type since the diameters of the holes 11_1 and 11_2 provided in the connecting block 10_1 and 10_2 are too large with respect to the tubing and indicate that connection must be to a header tank. The condenser of A1 is therefore of the parallel flow type as in the invention.

Hence, feature (a) is clearly and unambiguously derivable from the figures of A1.

Feature (b)

The skilled person knows that at the priority date of the contested patent this type of liquid tank was systematically fitted with means for removing foreign materials such as a filter. The skilled person knows that such means must be present because it is common knowledge that the refrigerant will pick up particles of foreign matter and a means must be provided to prevent them entering the compressor where they would

cause damage. The only logical place to position such means is in the liquid tank as shown for example in A5. This much is also confirmed in the patent itself at paragraph [0013], lines 23-26 which states "Usually a removal means for removing foreign materials from the refrigerant is provided within the case of the liquid tank.".

Feature (c)

This feature does not mean that the connection block must be a single element, not only is this evident from the wording of the claim itself, which does not use any expressions of the type "single element" or "mono-block", but also from figures 12 and 13 of the contested patent together with the corresponding part of the description given in paragraph [0048]. These describe an element 31 and a further element 55 which connects with the outlet and which go together to make up the connecting block. Hence, an example of a connecting block consisting of two parts is even given in the patent itself. Consequently, the connecting flanges 10_1 and 10_2 shown in figure 3 of A1 make up a connecting block within the meaning of the claim.

(ii) Respondent

Feature (a)

The figures in A1 are highly schematic. It cannot be directly and unambiguously derived from figures 1 and 3 that the condenser is of the parallel flow type since only one tank is shown. Accordingly, the condenser could be of the serpentine type. The appellant's

argument that the diameter of the holes 11_1 and 11_2 is too great to allow a connection to the tubing of such a condenser does not hold up since any number of adapter arrangements are possible and would not have been shown on such a schematic representation. There is nothing in the description of A1 concerning the structure of the condenser and the appellant is reading too much into the figures.

Feature (b)

The expression "usually" cited by the appellant from the contested patent does not mean "systematically". For example the liquid receivers shown in figures 7 and 44 of A2 are not provided with removal means. The drawings of the tank in A1 do not show or hint at the presence of a filter nor is one mentioned in the description. There is no necessity for any filter means to be in the liquid tank, it would be just as effective in protecting the compressor anywhere else upstream in the circuit. The fact that the appellant is referring to other documents in an attempt to show that there is always a removals means fitted in the tank would seem to indicate that this is a question of inventive step.

Feature (c)

The embodiment according to figures 12 and 13, referred to by the appellant in support of the contention that the connection block is not necessarily a single element, does not fall within the scope of the invention. The fact that this was not pointed out earlier is a an unfortunate oversight but should not be

allowed to detract from interpreting the claim in a correct manner.

Claim 1 only refers to "a connection block" or "said connection block" which must be "connected to an outer surface of a first end". The term "block" in itself clearly implies a one-piece element and the fact that it must be connected to an outer surface reinforces this interpretation.

Turning to the teaching of A1, although the figures are generally schematic those concerning the connecting arrangement can in fact be qualified as "partially schematic", since especially figure 3 shows a lot of detail. In particular, the connecting flanges 10_1 and 10_2 are shown to be separate elements and cannot by any measure be said to form a "block" as required by the claim.

In document A1' at page 6, lines 24-30 the specification of an upper flange portion and a lower flange portion, refers to their status after being fixed to the condenser i.e. they are portions of the condenser not of a connection block.

(b) *Inventive step*

(i) Appellant

There is no technical synergy between the alleged distinguishing features thus each can be handled separately for the analysis of inventive step:

Feature (a)

The objective technical problem to be solved is simply one of determining what type of condenser should be used in the circuit described in A1. The skilled person knows that the condenser defined by feature (a) is the type most commonly used in automobiles and, hence, this would be an obvious choice. If the skilled person needed any prompting in the matter the necessary hints are given in figure 19 of the contested patent itself, which refers to an example of the prior art, as well as in A8 at column 1, line 55 to column 2, line 7, which refers to the advantages of parallel flow condensers. Document A9 referred to in A8 also describes such condensers.

Feature (b)

The objective technical problem facing the skilled person is one of deciding which type of liquid tank to use in the circuit of A1 since the tank's inner structure is not actually shown. As already argued with respect to novelty, filter means were systematically provided in such liquid tanks at the priority date. However, if the skilled man should require a further teaching to include this feature, it can be found in documents A6 and A4, as well as the contested patent itself in figure 19 (see item 19) and the description at paragraph 13, lines 23-26. The liquid tank of A5 is also provided with a filter. Hence, the skilled person would as a matter of normal design practice include a means for removing foreign matter in the liquid tank.

Feature (c)

It is not accepted that this is a distinguishing feature and even if the Board should come to another conclusion it cannot be seen how making a connection block out one piece as opposed to two can involve an inventive step when the advantages and disadvantages of each can be readily appreciated and both are functionally identical. A2 (see in particular figure 34) gives the skilled person a direct hint that a one-piece connecting block can be used in the assembly of a liquid tank to a condenser. It is evident that a one-piece block offers certain advantages in terms of the number of parts and their fitting. A12 also shows a one-piece connecting block.

(ii) Respondent.

For the purposes of assessing inventive step it is considered that A7 represents the nearest prior art since A7 the device described therein concerns a parallel flow condenser comprising a liquid tank with filter means connected to the condenser (see figure 5). However, the flow pattern is different because the inlet and outlet ports are not both in the connecting block. The subject-matter of claim 1 is inventive compared with the device disclosed in A7 because it solves the problem of providing better cooling by increasing the condenser efficiency for a given size.

Nevertheless, taking A1 as the nearest prior art it is accepted that there is no synergy at least between the distinguishing features (a) and (b).

Feature (a)

There is no indication in any of the cited art as to why the skilled person would, rather than could, select a parallel flow type condenser for use in the circuit of A1.
The skilled person could choose any type of condenser and the appellant has failed to show that the parallel flow type would be chosen.

Feature (b)

The liquid tank of A1 is of the vapour-liquid type in which vapour and liquid go in but only vapour comes out. It is provided with inlet and outlet ports 21,22 in its cover. As is clear from paragraph [0005] of A1, no pipes extend into the tank and the liquid could only be discharged when the tank is full - a state which is normally avoided to prevent over-pressurisation. For this reason the skilled person would not modify the tank of A1 to comprise filter means. In the tanks shown in A4 and A6, liquid both enters and exits, thus they are of a different type and do not provide any hint to the skilled person to include filtering means in the tank of A1. If the skilled person did want to provide such means, it would be ensured that they were placed elsewhere in the circuit.

It is also physically impossible to connect the tank of A6 to the circuit of A1 since it is fitted with a pressure switch 19 (see figure 2) which is structurally incompatible with the mounting block of the device shown in figure 3 of A1. The skilled person would not remove these features of the tank shown in A6 since this would compromise safety.

Feature (c)

A2 discloses a porting arrangement which is entirely different to that of A1. In A2 the two ports of the connection block are connected to a single port of the mounting block 152 to create a by-pass, hence it would not be possible to use the connecting block of A2 in the circuit of A1. Further, A2 gives no indication to the skilled person that a one-piece connection block simplifies the mounting operation. The one-piece connecting block of A12 is situated between a compressor on the one side and a muffler and an evaporator on the other and, hence, is an entirely different arrangement.

The liquid tanks of A4 and A6 are entirely different in that liquid enters and then exits after being filtered.

Reasons for the Decision

1. *Novelty*

The appellant has argued that the subject-matter of claim 1 is not new with respect to document A1 taking into consideration its translation A1'.

In the Board's view this document (see in particular figures 3,4 and 6, description page 6, line 26 to page 7, line 25 of the translation annex 1') describes:

a condenser structure for a vehicle with a liquid tank (2) comprising:

a condenser (1A) and
a liquid tank (2) fastened to a first header pipe so as to receive a liquid refrigerant discharged from a discharging port (11_1) of said condenser, wherein said first header pipe and said liquid tank (2) are coupled with each other detachably in such a manner that a liquid refrigerant flowing passage (64_1) is formed so as to be air-tight and liquid-tight,
-said condenser (1A) further including a connection block (10_1,10_2) fastened to an outer surface and having a first discharging port (11_1) and a feeding port (11_2) in which said liquid refrigerant flows; and
-said liquid tank (2) further including a case of which a first end is closed and a second end (20) is opened, and
-a mounting block (6) fastened to said connection block (10_1,10_2) and fastened to said second end (20) of said case and having a take-in port (63_1) and a second discharging port (63_2), wherein
-said first discharging port (11_1) and said take-in port (63_1) are coupled and said second discharging port (63_2) and said feeding port (11_2) are coupled air-tightly and liquid-tightly;
wherein first and second refrigerant passages (64_1,64_2) are formed in said mounting block, each of said first and second refrigerant passages (64_1,64_2) having a horizontal hole and vertical hole, with said first refrigerant passage (64_1) being communicated with said take-in port (63_1) and said second refrigerant passage (64_2) being communicated with said second discharging port (63_2) and wherein
the condenser (1A) and the liquid tank (2) are coupled in series (see figure 6) in the direction of

refrigerant flow and in that each of said first and second refrigerant passages (64_1,64_2) are L-shaped.

The subject-matter of claim 1 differs therefrom in that:

(a) -the condenser includes a pair of header pipes spaced from each other, a plural number of heat transferring pipes disposed between said pair of header pipes so as to be spaced from each other, both ends of said heat transferring pipes being opened to an inside of said header pipes, and fins disposed between said adjacent heat transferring pipes spaced from each other; and
(b) -said liquid tank has removal means for removing foreign materials from said liquid refrigerant.

Thus, the subject-matter of claim 1 meets the requirements of Article 54 EPC.

The respondent has also argued that the subject-matter of claim 1 differs in that the connection block of claim 1 is a one-piece component as opposed to the two separate elements (10_1, 10_2) which make up the connector of the apparatus according to A1.

The Board does not accept this view since claim 1 as granted does not explicitly specify that the connection block must be a one-piece element and, in particular, does not use any expressions of the type "single element", "mono-block" or "one-piece element" which would have made this alleged attribute of the connection block clear. Further, as pointed out by the appellant, figures 12 and 13 of the contested patent

together with the corresponding part of the description given in paragraph [0048] describe an element 31 and a further element 55 which connects with the outlet, which together go to make up a connection block. Hence, an example of a connection block consisting of two parts is given in the patent itself. Although the respondent has argued that this embodiment does not fall within the scope of the claim, the Board is of the view that the wording of the claim covers connection blocks in general and not just those of a one-piece construction. Consequently, the connecting flanges 10_1 and 10_2 shown in figure 3 of A1 make up a connecting block within the meaning of the claim.

The appellant has argued that features (a) and (b) are also disclosed in A1. However, the Board is of the opinion that feature (a) is not directly and unambiguously derivable from A1, since the figures 1 and 3 only show a part of the condenser in schematic form and the description (translation A1') only refers to a condenser without specifying any particular type. Similarly with feature (b) none of the figures in A1 actually show a liquid tank fitted with foreign-matter removal means and the description makes no such mention either. The appellant's argument that such means are systematically fitted to all liquid reservoirs used in automobile systems and therefore must be present in the device of A1 is not convincing since the respondent has highlighted examples where this is not the case (see for example figures 7 and 44 of A2).

2. *Inventive step*

2.1 *Nearest state of the art.*

The respondent has argued that A7 should be taken as the most relevant state of the art and then shown that taking this as the starting point, the subject-matter of claim 1 is inventive. This may be so but appears to be beside the point in that the appellant has decided to launch an attack from A1 (possibly because it was anticipated that using A7 as a spring-board would not be successful for the reasons given by the respondent) and this is the case that must be answered.

The distinguishing features of claim 1 as granted with respect to A1 have been defined above during the analysis of novelty.

The Board concurs with the parties that there is no synergy between the two distinguishing features identified and that the analysis regarding inventive step can be handled separately for each.

2.2 *Feature (a)*

Starting out from A1 the skilled person is faced with the objective problem of selecting the type of condenser to be used. The appellant has convincingly shown that feature (a) specifies a standard parallel flow type condenser used in automobile air-conditioning systems as described for example in the applicant's own prior art given in figure 19 of the contested patent as well as in A8 and A9. Given these indications it would not require any inventive skill on the part of the

skilled person to implement such a condenser in the cooling circuit of A1 since this would merely be in accordance with the normal design criteria of ensuring high efficiency combined with low-weight which are characteristics specifically attributed to this type of condenser (see for example A8, column 2, lines 4 to 7).

Thus, feature (a) cannot be seen to make any contribution to an inventive step.

2.3 *Feature (b)*

A1 does not give any detail concerning the exact nature of the internal make-up of the liquid tank and is limited to showing a schematic of the connections into the cooling circuit. Thus, the skilled person reading A1 is merely informed that a liquid-tank is fitted in the circuit but is left ignorant as to which type.

The provision of the liquid tank with removal means for removing foreign materials from the liquid refrigerant solves the objective technical problem of ensuring the correct functioning of the cooling system by protecting sensitive components, notably the compressor, from the damaging effects of foreign matter accumulation.

Both parties agree that faced with this problem the skilled person would fit foreign-matter removal means in the circuit, the disagreement lies in whether it is obvious to fit these means in the liquid tank.

The appellant has shown that the provision of foreign-matter removal means in the liquid tank is usual if not systematic (see contested patent, description paragraph

[0013], lines 23-26) Further other documents, notably A6, show liquid tanks fitted with foreign-matter removal means which are suitable for fitting into the circuit of A1.

The Board is of the opinion that given these teachings the skilled person would not need to exercise an inventive step in order to make the decision to fit the liquid tank of A6, into the circuit of A1. The respondent's argument that this would not be possible because of the structural impediment caused by the pressure switch 19 positioned on the lid of the tank in A6 is not convincing since it assumes that the skilled person is bereft of even the most elementary pipe-fitting skills needed to adapt the connecting pipes to accommodate the pressure-switch.

In conclusion the Board is of the opinion that the subject-matter of claim 1 as granted does not involve an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

Registrar: Chairman

A. Counillon J. P. B. Seitz