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(C) [X] To Chairmen

**D E C I S I O N**  
of 24 October 1996

**Case Number:** T 0816/94 - 3.2.3

**Application Number:** 92200034.4

**Publication Number:** 0480914

**IPC:** F25B 39/04, F28F 9/02

**Language of the proceedings:** EN

**Title of invention:**  
Condenser

**Applicant:**  
SHOWA ALUMINUM KABUSHIKI KAISHA

**Opponent:**  
-

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54(2), 56, 87(1), 88(2)(3)  
Paris Convention Art. 4(F)

**Keyword:**  
"Priority claim (invalid)"  
"Inventive step (no)"

**Decisions cited:**  
G 0003/93

**Catchword:**  
-



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Boards of Appeal

Chambres de recours

Case Number: T 0816/94 - 3.2.3

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.3  
of 24 October 1996

**Appellant:**

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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 19 May 1994  
refusing European patent application  
No. 92 200 034.4 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** C. T. Wilson  
**Members:** J. du Pouget de Nadaillac  
L. C. Mancini

## Summary of Facts and Submissions

- I. The present appeal is directed against the decision dated 19 May 1994 of the Examining Division of the European Patent Office, who rejected European patent application No. 92 200 034.4 (Publication No.: EP-A-0 480 914) on the ground of lack of inventive step, having regard in particular to document EP-A-0 219 974 (referenced D0, hereinafter), considered as closest prior art.

The appellant (patentee) lodged the appeal on 8 July 1994 and paid the appeal fee on 9 July 1994. The statement of grounds was received on 16 September 1994. Together with it, a single new claim was submitted to replace all claims on file (hereinafter, referenced as "the single claim").

- II. Said single claim reads as follows:

"A condenser adapted for use in a car air-conditioning system in such a manner that the condenser co-operates with an evaporator, compressor and other apparatuses so as to build a refrigeration cycle for the system, wherein a gaseous coolant which has been compressed by the compressor to a high temperature and high pressure is subjected to a heat exchange between it and air so as to liquefy it within the condenser, the condenser comprising: a plurality of tubular elements (11) disposed in parallel with each other, a plurality of fin members (12) each interposed between adjacent tubular elements (11) and a pair of hollow headers (113, 14) to which both ends of each tubular elements are fluid-tightly connected, characterized in that each header (113, 14) comprises a hollow aluminum pipe each tubular element (11) comprises a flat hollow aluminum tube, each tubular element (11) having one or more

internal reinforcing portions which connect an upper wall of the tubular element to a lower wall thereof, the opposite ends of the tubular elements (11) being inserted into slits (15) provided in the headers (113, 14) and brazed therein so as to be fluid-tight, that the tubular elements (11) have different lengths and are grouped with respect to their lengths, wherein at least one of the headers (113) is divided into two segments (113a, 113b) so as to enable one of the segments (113b) to accept the shorter tubular elements, thereby forming a space (27) void of tubular elements, a connecting fin member as one of the fin members (12) being interposed between adjacent groups of tubular elements having different lengths, both groups being connected by the connecting fin member (12) and that the coolant having entered one of the segments (113a) connected to one end of one group of tubular elements is caused to flow therethrough and into the other header (14) to which the other ends of the adjacent groups of tubular elements are connected, the coolant subsequently being caused to make a U-turn within the other header (14) before flowing backward through the other group of tubular elements so as to return to the other segment (113b) to which the ends thereof are connected."

III. In his statement of grounds, the appellant substantially argued as follows with respect to document D0:

- Document D0 (EP-A-0 219 974) was published on 29 March 1987, thus after the priority dates of the patent application in suit. Moreover, although neither of the priority Japanese documents of the patent application in suit discloses the features, that "the tubular elements have different lengths" and that "at least one of the headers is divided into two segments", they do disclose all the other.

fundamental features of the present invention, so that the present patent application can nevertheless enjoy the benefit of the "partial priority" in accordance with the provision of Article 4(F) of the Paris Convention, and document D0 is not part of the prior art.

- IV. In a communication dated 23 January 1996 of the Board of Appeal, accompanying the invitation to oral proceedings requested auxiliarily by the appellant, the Board draw the appellant's attention to decision G 3/93 (OJ EPO 1995, pages 18 to 24) of the Enlarged Board of Appeal. Applying the principles of said decision, document D0 is to be considered as part of the prior art according to Article 54(2) EPC. The Board, then, expressed the provisional opinion that the newly filed claim lacked an inventive step in view of prior art documents D0 and D7 (JP-A-59-140123, cited during the examination procedure).
- V. With a written submission received on 24 July 1996, the appellant announced that he did not wish oral proceedings to take place and requested the Board to make its decision on the basis of the written submissions previously made.

## Reasons for the Decision

1. The appeal is admissible.
2. *Validity of the claimed priority of the patent application in suit*
  - 2.1 The patent application in suit, which is a divisional application of an earlier European patent application No. 87 306 599.9 (publication No. EP-A-0 255 313) filed on **27 July 1986**, can have the benefit of priority of said earlier patent application according to Article 76(2) EPC. Two priorities were claimed from Japanese patent applications JP 179763/86 dated **29 July 1986** and JP 263138/86 dated 4 November 1986. Since document D0 was published on 29 April 1987, thus during the so called "priority interval" between the earliest priority date of 29 July 1986 (see Article 88(2) EPC, last sentence) and the filing date 27 July 1987 of the patent application in suit, it is of importance to examine whether the priority right is validly claimed.
  - 2.2 In decision G 3/93 the Enlarged Board of Appeal decided that a claim to priority is invalid when the priority document and the subsequent European application do not concern the **same invention** (Article 87(1) EPC) because the European application **claims subject-matter not disclosed in the priority document**. Article 4, Section F, of the Paris Convention, which was referred to by the appellant and which corresponds to Article 88(2) and (3) EPC, concerns the claim of multiple priorities and, thus, is not relevant in this respect.
  - 2.3 In the present case, as recognised by the appellant, the subject-matter of the single claim includes features which were not disclosed in the priority

documents and the consequence thereof is that the appellant is not entitled to claim either mentioned priority.

2.4 In consequence thereof, document D0 is part of the prior art according to Article 54(2) EPC.

3. Document D0 discloses a condenser for use in air-conditioning systems in such a manner that the condenser cooperates with an evaporator, compressor and other apparatuses so as to build a refrigeration cycle for the system. The condenser comprises all the elements mentioned in the preamble of the single claim of the patent application in suit, namely a plurality of fin members each interposed between adjacent tubular elements and a pair of hollow headers to which both ends of each tubular element are fluid-tightly connected. This known condenser further has features of the characterising portion of the single claim, namely that:

- each header comprises a hollow pipe,
- each tubular element comprises a flat hollow tube,
- each tubular element has one or more internal reinforcing portions which connect an upper wall of the tubular element to a lower wall thereof,
- the opposite ends of the tubular elements being inserted into slits provided in the headers and brazed therein so as to be fluid tight.

In this condenser known from D0, the coolant introduced into one header flows through all tubular elements and then into the other header, from which it reaches the outlet pipe of the condenser.

4. The condenser according to the single claim differs from this known condenser in that:

- (a) The condenser is part of a **car** air conditioning system;
- (b) The header pipes and tubular elements are made of aluminium;
- (c) The tubular systems have different lengths and are grouped with respect to their lengths, wherein at least one of the headers is divided into two segments so as to enable one of the segments to accept the shorter tubular elements, thereby forming a space void of tubular elements, a connecting fin member as one of the fin members being interposed between adjacent groups of tubular elements having different lengths, both groups being connected by the connecting fin member and
- (d) that the coolant having entered one of the segments connected to one end of one group of tubular elements is caused to flow therethrough and into the other header to which the other ends of the adjacent groups of tubular elements are connected, the coolant subsequently being caused to make a U-turn within the other header before flowing backward through the other group of tubular elements so as to return to the other segment to which the ends thereof are connected.

5. The two first distinguishing features (a) and (b), which concern either **the use** of the condenser or **the material** mainly **used for its manufacturing** have no functional relationship with the second group of features (c) and (d), which concern the whole configuration of the header pipes and tubular elements. Thus, features (a) and (b) are to be considered separately.



Both of these features (a) and (b) are either not new or at least obvious:

- With respect to feature (a), which concerns the use itself of the condenser, said use is considered obvious, since the use of these kinds of condenser and air-conditioning systems is mainly to be found in the car industry, which needs small-sized systems due to the lack of space in the cars.
- Feature (b) is not new. Document D0 does not recite this feature explicitly, however discloses it implicitly by mentioning as part of its disclosure the content of three US-documents, which relate to the manufacturing of the pipe and tubular elements of such a condenser, such a feature being well-known in this technical field, (see FR-A-2 367 996 and EP-A-0 131 444, which also concern the manufacturing of such a condenser).

6. The second group of features, namely (c) and (d), constitutes in fact the core of the present invention:

As indicated by its wording itself, feature (c) aims at providing a condenser having a space void of tubular elements. Such a configuration allows the condenser to be mounted in spaces where obstacles may be present, and, this is done by keeping a small condenser core having nevertheless a large area for effecting heat transfers because of the U-turn path of the coolant, see feature (d). This feature (d) mainly describes the flow of the coolant through the condenser, but, by doing so, it implies structural features of the condenser, namely that the coolant inlet is connected with one segment of the divided header and the coolant outlet to the other segment. Further, since both groups of tubular elements having different lengths are

connected by a connecting fin member, the rigidity of the whole condenser is improved. Moreover, this arrangement because of the U-turn path of the coolant ensures that "gas-liquid mixing" takes place, thus improving the heat exchange efficiency.

7. Therefore, starting from the condenser known from D0, the object of the present invention can be defined as the provision of a condenser, which has a small and rigid core with nevertheless a large effective cross-sectional area for the coolant in a delimited space of a car room where obstacles may be present.
  
8. JP-A-59-140123 (D7) describes a radiator device comprising two groups of tubes having different lengths so as to allow the provision of a space for a motorcycle engine. Both ends of each tube are respectively fluid-tightly connected to a header and **one of the headers is internally divided by a partition.** Moreover, **each segment** thereby obtained of said header is connected either to the coolant inlet or to the coolant outlet. Thus, inside the radiator, the coolant has a U-turn flow. Fins are provided between the tubes and, more particularly between the adjacent tubes of both groups of tubes.

Hence, for solving the same problem, namely to provide a radiator device having a relatively small core together with a space void of tubes although a large effective cross-sectional area for the coolant is maintained, the person skilled in the art receives the suggestion to divide one header into two segments and to provide tubes with different lengths, a U-shaped flow of the coolant being realized. In this prior art,

the header is internally divided and deformed so that an inclined side of the radiator shape is formed, since apparently the purpose is to straddle other elements of the motorcycle.

9. The wording of the single claim of the patent application in suit only mentions a header divided into two segments and, thus, this feature is shown by this prior art. Interpreting this feature, however, in the light of the description of the patent application in suit, an external division of the header, namely a division into two separate headers, is meant. Having regard to the whole teaching of the JP document and, in particular, to the given information of a divided header, it seems however to lie within the capacity of the skilled person to divide internally or externally the header depending on the shape which is wished, said shape being mainly determined by the shape of the obstacle to be avoided. When an L-shaped radiator is wanted, the choice of dividing one header into two separate header segments would immediately occur to the person skilled in the art, the functioning of the separated header segments being identical whether they are physically next to each other or spaced apart.
  
10. Therefore, starting from the condenser known from document D0 and wishing a particular shape, namely an L-shape, document D7 suggests the solution according to the single claim. It is thus concluded that the subject-matter of this single claim of the patent application in suit does not involve an inventive step in the sense of Article 56 EPC.

Order

for these reasons it is decided that:

The appeal is dismissed.

The Registrar:



N. Maslin

The Chairman:



C. T. Wilson

