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**Datasheet for the decision
of 4 December 2013**

Case Number: T 1613/09 - 3.5.06

Application Number: 07113060.3

Publication Number: 1884866

IPC: G06F1/20

Language of the proceedings: EN

Title of invention:
Electronic apparatus

Applicant:
FUJITSU LIMITED

Headword:
FUJITSU/Notebook cooling

Relevant legal provisions:
EPC 1973 Art. 56
RPBA Art. 12(2), 12(4), 13(1), 13(3)

Keyword:
Inventive step - main request (no)
Late-filed auxiliary requests - admitted (no)

Decisions cited:
T 0859/03, T 0298/93, T 0506/95

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1613/09 - 3.5.06

**D E C I S I O N
of Technical Board of Appeal 3.5.06
of 4 December 2013**

Appellant: FUJITSU LIMITED
(Applicant) 1-1, Kamikodanaka 4-chome,
Nakahara-ku
Kawasaki-shi,
Kanagawa 211-8588 (JP)

Representative: Fenlon, Christine Lesley
Haseltine Lake LLP
Lincoln House, 5th Floor
300 High Holborn
London WC1V 7JH (GB)

Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 12 March 2009
refusing European patent application No.
07113060.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairwoman: M. Tardo-Dino
Members: G. Zucka
S. Krischer

Summary of Facts and Submissions

I. The appeal is against the decision by the examining division, with reasons dispatched on 12 March 2009, to refuse European patent application 07 113 060.3, on the basis that the subject-matter of the independent claims 1 and 4 of the main request and claim 1 of the auxiliary requests 1 to 3 was not inventive, Article 56 EPC 1973. The following documents were cited during the first instance procedure:

D1 = US 2002/117 291 A

D2 = US 2005/007 730 A

D3 = US 2003/151 892 A

II. A notice of appeal was received on 14 May 2009, the appeal fee being paid on the same day. A statement of the grounds of the appeal was received on 22 July 2009.

III. The appellant requested that the decision under appeal be set aside and a patent granted on the basis of the claims labelled "Main Request" or "1st Auxiliary Request" filed with the grounds of appeal. The appellant made a conditional request for oral proceedings.

IV. The board issued a summons to oral proceedings. In an annex to the summons, the board set out its preliminary, negative opinion on the appeal.

V. On 4 November 2013, the appellant filed an additional auxiliary request, with a single claim labelled "2nd Auxiliary Request".

VI. The appellant requests that the decision under appeal be set aside and a patent be granted on the basis of

claims 1 to 5 of the main request or claims 1 to 3 of the auxiliary request 1, both filed with the statement of grounds, or on the basis of the single claim of the auxiliary request 2 filed with the letter of 4 November 2013, and on the basis of the description pages 1, 2, 4, 5, 23 and 27 as filed with the letter of 5 November 2013 and pages 6 to 22 and 24 to 26 as originally filed, and drawings 1 to 19 as originally filed.

VII. The independent claim 1 of the main request reads as follows:

A notebook personal computer (11), having a main body enclosure (12) and a display enclosure (13) coupled to the main body enclosure (12) for relative swinging movement, which computer (11) further comprises:

- a printed wiring board (19) located inside the main body enclosure (12);
- an electronic component (21, 22) mounted on the printed wiring board (19);
- a closed circulating loop for coolant, placed in the main body enclosure (12);
- a heat receiver (28, 29) located in the closed circulating loop, the heat receiver (28, 29) having a thermal conductive plate (45) received on the electronic component (21, 22), the heat receiver (28, 29) defining a flow passage on the thermal conductive plate (45);
- a heat exchanger (31) located in the closed circulating loop so as to absorb heat from the said coolant; and
- a tank (37) located in the closed circulating loop at a position outside the printed wiring board (19) so as to store coolant and air in the closed circulating loop.

The independent claim 4 of the main request distinguishes itself from claim 1 in that the wording "tank...to store coolant and air in the closed circulating loop" is replaced by "pump...to circulate the coolant along the closed circulating loop".

The independent claim 1 of the auxiliary request 1 combines the features of claims 1 and 4 of the main request.

The single claim of the auxiliary request 2 combines the features of claims 1 and 4 of the main request, together with the following additional features:

- an air outlet (33) defined in the main body enclosure (12);
- a fan unit (32) fixed to the printed wiring board (19) and arranged to generate airflow sequentially running through the heat exchanger (31) and the air outlet (33);
- a partition plate (84) placed in a space between the pump (38) and the printed wiring board (19) and between the tank (37) and the printed wiring board (19), the partition plate (84) standing upright from a bottom plate of the main body enclosure (12);
- an air inlet or first and second air inlets (85, 86) defined in the bottom plate of the main body enclosure (12) to introduce air into the inner space of the main body enclosure (12), the air inlet (85) being opposed to the tank (37) and the pump (38) in the inner space of the main body enclosure (12) or the first air inlet (85) being opposed to the tank (37) in the inner space of the main body enclosure (12) and the second air inlet

(86) being opposed to the pump (38) in the inner space of the main body enclosure (12).

VIII. Oral proceedings were held on 4 December 2013. At their end, the chairwoman announced the board's decision.

Reasons for the Decision

1. *The admissibility of the appeal*

In view of the facts set out at points I and II above, the appeal is admissible, since it complies with the EPC formal admissibility requirements.

2. *Interpretation of the claims*

In order to allow a correct assessment of the presence of an inventive step, the board considers it necessary first to establish how some of the terms used in the claims should be interpreted.

2.1 *Notebook personal computer*

The board notes that no precise, generally accepted definition exists for the term "notebook (personal computer)". Traditionally, it designates a "portable computer smaller than a laptop" (see the entry for "note" in the Oxford English Dictionary, fifth edition). Firstly, however, this definition is itself already rather vague, as it depends on the definition of "laptop", *i.e.* traditionally "a computer small and light enough to be used on one's lap" (see the entry for "lap" in the same dictionary), which can not exactly be called a very precise definition. Secondly, the board notes that in the present day the distinction

between "laptop" and "notebook" has become blurred and the two terms are being used interchangeably.

The board will interpret the expression "notebook personal computer" as any personal computer that could conceivably be offered for sale under the name "laptop" or "notebook", including so-called "rugged portable computers". One consequence of this interpretation is that there is no precise upper limit for the size or weight of a "notebook personal computer"; much depends on the subjective impression of the potential user, keeping in mind his or her physique as well as the intended use of the "notebook".

2.2 *for relative swinging movement*

In the present context, the word "for" is interpreted as indicating a capability or an intention, *i.e.* a relative swinging movement could but not necessarily at any moment does take place.

2.3 *so as to store coolant and air in the closed circulating loop*

The wording "so as to" is also interpreted as indicating nothing more than that the tank should be *suitable* to store coolant and air in the closed circulating loop.

3. *Closest prior art*

3.1 The board points out that the appeal proceedings are independent from the proceedings before the department of first instance. As a consequence, the appellant cannot simply refer to the submissions he made during the first instance proceedings. However, the argument

made by the appellant during the proceedings before the examining division in his letter received on 2 February 2009, second page, overlaps with what he contends in his statement of grounds of appeal, *viz.* that D1 can not be considered the closest prior art and that, among others, starting from a "tower" computer is plainly contrary to the situation encountered by the inventor. This statement implies that, according to the appellant, the closest prior art should necessarily reflect the situation allegedly tackled by the person mentioned as inventor in the present application. The appellant referred to a passage from the Case Law Book (the correct reference of which is I.D.3.2.). However, the notion of "inventor" does not appear in the decisions themselves referred to in the passage cited. T 859/03 stated (see Reasons 2.3.2): "The most suitable starting point to be selected for assessing inventive step of a claimed subject-matter is, according to the jurisprudence of the Boards of Appeal of the EPO, not a subject-matter (in the present case a composition) having the most possible number of features in common with the claimed one but a technically realistic starting point, contained in a document dealing with the same technical problem as the claimed invention, from which the claimed invention could most easily have been made by a *skilled person* [emphasis added by the Board] at the filing date of the patent in suit (see *e.g.* T 298/93, point 2.2.2 of the reasoned decision and T 506/95, point 4.1 of the reasoned decision, neither published in the OJ EPO)". Therefore, in line with established case law, the present board considers that the closest prior art is that which constitutes the most promising starting point for the *skilled person* to arrive at the claimed subject-matter without requiring inventive activity. Finding the closest prior art can be an iterative process, *i.e.* if it turns out that a

problem-solution analysis starting from D1 demonstrates lack of inventive step in a more straightforward manner than starting from other documents, D1 should be considered the closest prior art.

- 3.2 In the present case, it is not unrealistic to start from D1 as the closest prior art because the transfer of techniques used in "desktop computers" to "notebooks", with adaptations that are necessary in view of the special constraints of notebooks, is part of normal technical evolution. Of primary relevance is what *the skilled person* in the concerned technical field would have done when faced with the disclosure of D1 before the priority date of the application. Given the board's finding that there was no reason for the skilled person to discard D1 (see 4.2 to 4.7 below), the board judges that according to the criteria of the established case law, D1 represents the closest prior art. D1 discloses:

A computer (2) having a main body enclosure (4), which computer further comprises

- a printed wiring board (mother board 26; see paragraph [0047]) located inside the main body enclosure;
- an electronic component (e.g. the CPU 28) mounted on the printed wiring board (see paragraph [0047]);
- a closed circulating loop for coolant (38, 46, 48), placed in the main body enclosure (see figure 2 and paragraph [0049]);
- a heat receiver (paragraph [0048]: "heat exchanging device") located in the closed circulating loop, the heat receiver having a thermal conductive plate received on the electronic component (implied by paragraph [0048],

second sentence: "The passageway heat-exchangeably contacts with the heat-producing components"), the heat receiver defining a flow passage on the thermal conductive plate (see paragraph [0048], last sentence);

- a heat exchanger (heat dissipation device 36) located in the closed circulating loop so as to absorb heat from said coolant (see paragraph [0049]); and
- a tank (reservoir 38) located in the closed circulating loop at a position outside the printed wiring board (see figure 2) so as to store coolant and air in the closed circulating loop (D1 does not explicitly mention the presence of air but the reservoir of D1 is at least *suitable* (see above) to store a coolant liquid including some air bubbles).

4. *Main request*

4.1 The difference between the subject-matter of claim 1 and the disclosure of D1 is that the computer is a notebook personal computer, which has a display enclosure coupled to the main body enclosure for relative swinging movement. These distinguishing features solve the objective technical problem of how to apply the teaching of D1 to a portable computer.

4.2 It is considered obvious for the skilled person to wish to adapt the technique used in the desktop computer of D1 to a portable computer, given the continuous drive to transfer technology from desktop computers to portable computers and the explicit statement in D1 (paragraph [0019]) that "The apparatuses according to the present invention are relatively simplified and can be standardized in view of *type and size* [emphasis

added] so as to be easily applied to various types of computers".

4.3 During the oral proceedings, the appellant contended that the "various types" referred to in D1 only comprise tower PC's (see paragraph [0013]) and rack-mounted computers (see paragraph [0014]), both in the context of a harsh (more specifically dusty) industrial environment. He further pointed out that, while at some time in the past there may have existed a drive to transfer technology from desktop computers to portable computers, this was no longer the case at the priority date of the application (25 July 2006). The current trend is to focus on development of portable computers and it has, in fact, become difficult even to find a desktop computer at mainstream computer shops. Further, even if it may be usual to introduce components first in desktop PC's and then in portable computers, this is not necessarily true for component *arrangements*, given the specific space constraints that exist in the latter.

4.4 The board agrees that it is indeed well known that already at the priority date of the application there was a trend for portable computers to become more popular (although it is a matter of record that their sales only overtook the sales of desktop PC's in 2008). However, there is no reason for such a reversal in popularity to cause a reversal in technological development. Desktop PC's still impose less restrictions on developers in terms of size and weight. It is therefore still considered natural first to develop components for such PC's, and then later to adapt them to the specific requirements of portable computers.

4.5 Concerning the appellant's statement that D1 only contemplates an implementation in tower or rack-mounted computers operating in a harsh industrial environment, the board does agree that the skilled person is more likely to implement the system of D1 in a computer that operates in such an environment. However, it would be unrealistic to consider the skilled person so narrow-minded that he/she would not realise that the teaching of the document applies to computers in general, also to portable computers, especially larger portable computers. Such larger portable computers would also not preclude the implementation of D1's teaching regarding the *arrangement* of components.

4.6 One particular class of portable computers that would immediately come to mind are notebook computers, which usually have a separate display enclosure coupled to the main body enclosure, allowing for relative swinging movement. It would also be one of the most obvious alternatives to keep the complete cooling arrangement in the main body enclosure, *i.e.* simply to transfer the concept of D1 in a one-to-one manner to a notebook computer. The only reason for not doing so would be that, as submitted by the appellant, space in "typical" notebook computers is at a premium and a skilled person would, in such a case, try and reserve as much space as possible for the motherboard in the main enclosure, by placing the tank and the heat dissipation device in the display enclosure (as it is done in D2 and D3). However, as pointed out in 2.1 above, the concept of "notebooks" is very broad and includes relatively large ruggedised portable computers. Such computers are commonly used, *e.g.* in harsh industrial environments. The skilled person would therefore naturally think about them as a possible class of notebooks where the teaching of D1 could be applied. He or she would then

take into consideration the requirement that such computers be "tough". Putting elements of the cooling system in the display enclosure would make the notebook more vulnerable, given that the circulating loop would need to bridge the main and the display enclosure, and would obviously not serve this requirement. At the same time, it would not be considered unacceptable for a ruggedised computer to have a somewhat larger main enclosure.

4.7 The appellant argued during the oral proceedings that, even for the case of a ruggedised laptop, the skilled person would want to place the tank and the heat dissipation device in the display enclosure, given that the large surface of that enclosure allows for a much improved cooling effect. The board agrees that such an arrangement allows for better cooling but it would not necessarily be the most obvious choice in a ruggedised laptop, for the reasons indicated above. At the very least, the appellant's argument does not refute the board's finding that a simple transfer of the concept of D1 in a one-to-one manner to a notebook computer constitutes one of the most obvious alternatives to the skilled person and the appellant did not convince the board that the skilled person would have been deterred from undertaking it.

4.8 For these reasons, the board judges that the main request does not satisfy the requirements of Article 56 EPC 1973.

5. *Auxiliary request 1*

The appellant had not indicated in the grounds of appeal what are the particular merits of the auxiliary request 1. During the oral proceedings, he stressed

that, given the nature of the independent claim 1, the arguments given for the main request equally apply to the auxiliary request 1 and that it should therefore be considered admissible. The board however points out that the purpose of an auxiliary request is to provide a fallback position to the party which filed the request, in case the board judges that higher ranking requests are unallowable. For this reason, equating the merit of an auxiliary request to that of a higher ranking request is not sufficient. Instead, the appellant should have explained what is the *additional* merit of the auxiliary request 1, compared to the main request. Given that Article 12(2) RPBA requires that the statement of grounds of appeal contain the appellant's complete case, the board does not admit the request.

6. *Auxiliary request 2*

6.1 Not all of the features that have been added to claim 1 were present as such in the original claims. In addition, they focus on aspects of the application that had not been highlighted before (e.g. air inlet/outlet, fan unit). For both these reasons, there was obviously no reason for the search division to search those features and they are therefore assumed not to be covered by the search report. Given that the issues raised in the summons to the oral proceedings are the same as in the decision of the first instance, it can not be said that the amendment was made as a direct response to the summons. Instead, the request could and should already have been filed when the relevant issues were known to the appellant, *i.e.* during the examination procedure or at the latest together with the grounds of appeal.

6.2 The appellant submitted during the oral proceedings that the reference to ruggedised portable computers was made for the first time in the board's summons and the new auxiliary request constitutes an appropriate response to this new line of reasoning. However, the board notes that the amendment introduced in the auxiliary request 2 does not in any way exclude ruggedised laptops from the claimed subject-matter or otherwise constitute a clear attempt to deal with the issues raised in the board's summons. The board considers that the apparent intention of the new auxiliary request is to shift the focus of the invention away from the initial ideas that were covered by the search report, *i.e.* at least the "closed circulating loop" and possibly also the shielding of the pump and the tank from the heat produced by the electronic component, to a new concept, *i.e.* to achieve additional cooling by means of an air flow. By shifting the focus of the invention in this way, the appellant has amended his case at a very late stage of the proceedings in such a manner that it would necessitate at least an additional search, which would not be in the interest of procedural economy.

6.3 For this reason, the auxiliary request 2 is not admitted under Articles 12(4), 13(1) and 13(3) RPBA.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairwoman:



L. Fernández Gómez

M. Tardo-Dino

Decision electronically authenticated