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D E C I S I O N
of 4 March 2003

Case Number: T 0191/98 - 3.2.6

Application Number: 88900975.9

Publication Number: 0343174

IPC: B23K 26/00

Language of the proceedings: EN

Title of invention:

Method and apparatus for laser processing of materials

Patentee:

PRC Corporation

Opponent:

Siemens AG

Headword:

-

Relevant legal provisions:

EPC Art. 52(1), 56, 113(1)

Keyword:

"Inventive step - no"

"Admittance of late filed evidence - yes"

"Right to be heard - yes"

Decisions cited:

G 0004/92

Catchword:

-



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Boards of Appeal

Chambres de recours

Case Number: T 0191/98 - 3.2.6

D E C I S I O N
of the Technical Board of Appeal 3.2.6
of 4 March 2003

Appellant: SIEMENS AG
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 18 December
1997 rejecting the opposition against European
patent No. 0343174.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. C. Kadner
M. J. Vogel

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 343 174 in respect of European patent application No. 88 900 975.9 filed 15 December 1987 and claiming a US-priority of 29 November 1986 was published on 2 February 1994. Independent claims 1 and 14 as granted read as follows:

"1. A method of processing a material during which the beam of a laser device is moved along said material and wherein said laser device is controlled so as to output a laser power form with respect to time with

- a) subsequent peak pulses (5) which exceed the maximum continuous wave power level of the device,
- b) sections (6) of constant continuous wave power at a level (P_6) said processing occurs and located in between subsequent of said peak pulses (5),

characterized by selecting the ratio of a time span (t_2) between subsequent peak pulses (5) and the time span (t_2-t_1) of said sections (6) in between said subsequent pulses (5) so that the average output power level (P_8) is equal or higher than the level of said sections (6).

14. A laser apparatus for performing the method of one of claims 1 to 13 with a laser device and control means for the power of the beam of said laser device, characterized by the fact that said control means (10, 12, 14) is set to control said device (28) so that it emits a laser beam (3) with subsequent power peak pulses (5), which exceed the maximum continuous wave power level of said device, with sections (6) of constant continuous wave power located in between subsequent of said peak pulses (5), whereby the ratio

of a time span between subsequent peak pulses (t_2) and the time span (t_2-t_1) of said sections in between said subsequent pulses being so that the average output power level (P_8) is equal or higher than the power level of said sections (P_6)."

- II. Notice of opposition was filed against this patent on the grounds of Article 100(a) EPC (lack of novelty and inventive step).
- III. By decision announced during the oral proceedings on 10 November 1997 and posted on 18 December 1997 the Opposition Division rejected the opposition.

The Opposition Division was of the opinion that the subject-matter claimed met the requirements of novelty and inventive step having due regard to the state of the art relied upon by the Appellant-Opponent

With respect to an alleged public prior use substantiated by the following documents:

- (D5) Instructions for use of the RS-500 - 500 Watt CO₂-Laser of the Rofin-Sinar Laser GmbH
- (D5a) Attached electrical schematic diagrams 5-1 to 5-5, all dated 30 June 1984
- (D6) Invoices Nr. 5354/10005 dated 15 June 1984, 5390/1005 dated 22 June 1984 of Rofin-Sinar Laser GmbH together with confirmations of purchase contract No. ZZ830000 and ZZ830400, both dated 30 March 1984,

the Opposition Division was of the opinion that no sufficient evidence was provided that, when the laser device was operated in the switch position 5 or 6 as shown in circuit diagram 5-2 (PRINT 2-02-1) of D5a, the

"simmer strom" would produce a constant continuous wave power level at which material processing occurred. Therefore the apparatus of D5 in accordance with the alleged prior use was not considered pertinent for the method of claim 1.

The witness offered for giving further evidence of the public prior use was not heard.

- IV. On 13 February 1998 notice of appeal was lodged against this decision by the Appellant together with payment of the appeal fee.

The statement of grounds of appeal was filed on 25 April 1998. On appeal the Appellant additionally relied *inter alia* on:

(D10) "High Power Lasers and Their Industrial Applications" by D. Schuöcker, Divisional Meeting of the Quantum Electronics Division/European Physical Society, 15 to 18 April 1986, Innsbruck, Austria

filed with letter dated 8 December 2000, in which also other new documents were cited.

With letter dated 5 August 2002 the Appellant filed further documents and offered a second witness for further substantiation and proof of the alleged public prior use of the Rofin Sinar laser device together with samples treated with a laser beam of low power. With letter dated 9 August 2002 additional samples were provided.

- V. In its submissions dated 27 October 1998 and 1 November 2000 the Respondent (Patentee) held that the claimed invention was novel and inventive, and that therefore the patent should be maintained as granted. Auxiliarily oral proceedings were requested.

With letter dated 4 February 2003 the Respondent submitted that it would not attend the oral proceedings summoned for 4 March 2003 and withdrew its auxiliary request of 1 November 2000.

- VI. In its communications dated 5 May 2000 and 31 May 2002 the Board expressed doubts whether the evidence provided within the opposition period in respect of the alleged prior use was sufficiently substantiated. However, if the gap in the chain of proof could be closed by the Appellant the alleged public prior use might be relevant, so that hearing of the witnesses might become necessary. In respect of the late filed documents it would have to be discussed at the oral proceedings whether they should be introduced into the appeal proceedings.

In its decision on the taking of evidence of 25 November 2002 the Board decided to hear the two witnesses in respect of the alleged public prior use and the function of the laser apparatus concerned.

- VII. Oral proceedings were held on 4 March 2003.

The Appellant requested that the decision under appeal be set aside and that the European patent No. 0 343 174 be revoked.

The Respondent requested in writing that the appeal be dismissed and that the patent be maintained.

VIII. In support of its request the Appellant, in addition to its reasoning based on the alleged prior use mainly relied upon the following submissions:

The method according to claim 1 was not novel with respect to D10. Since this claim related to a method its teaching should be able to be carried out independent of the properties of the laser device. Therefore the relation to the feature of a maximum continuous wave power level of the laser device should be ignored.

The wording of the claim was fulfilled by the method described in connection with Figure 8 of D10. This document related to a method of processing a material during which the beam of a laser device was moved along a material and wherein a laser device was controlled so as to output a laser power form with respect to time. The diagram showed peak pulses (P_{puls}) and sections of constant continuous wave power (P_{paus}) located in between subsequent of said peak pulses, and the ratio of a time span between subsequent peak pulses and the time span of the sections in between the subsequent pulses were so that the average output power level (P_{mittel}) was higher than the level of the sections (P_{paus}). To a skilled person it was clear that processing occurred not only at a peak power of 1000 W but also at an output power level of 200 W (page 218, second paragraph).

Therefore D10 should be admitted to the proceedings for reason of its high relevance.

At a minimum the method of claim 1 did not involve an inventive step. Indeed, the process of D10 could be carried out with a laser device of nearly 1000 W output power, but in view of the costs of a laser in relation to its continuous wave power output the skilled person

would obviously use a laser device with a power output just sufficient to perform the desired treatment, in the example of D10 consequently a laser device having a continuous wave power output of about 600 W would be selected so that by the selection of time spans as shown in Figure 8 the average power output (P_{mittel}) was higher than the sections (P_{paus}).

VIII. No submissions were received from the Respondent in respect of the Appellant's argumentation based on D10.

Reasons for the Decision

1. The appeal is admissible.
2. *Admissibility of late filed evidence (D10)*

According to the case law of the Boards of Appeal late filed evidence may only be introduced into the proceedings if particular conditions are met. The later in the procedure the new evidence is filed the stricter it is scrutinised for its relevance. In principle the new material must be *prima facie* "highly" relevant in the sense that it is likely to prejudice maintenance of the European patent.

For the reasons given below the Board is convinced that D10 comes closer to the claimed method and apparatus according to claim 1 and 14 than the prior art on file. Therefore, because of its apparent relevance in accordance with the case law of the Boards of Appeal this new document is admitted into the proceedings (see point 4 below).

3. *Novelty*

3.1 In its letter dated 8 December 2000 the appellant explained in detail why the disclosure of D10 should be considered novelty destroying for the subject-matter of claim 1. In particular reference was made to the embodiment described on pages 217 and 218, in which for cutting of material a pulsed peak power of 1000 W and a pause power of 200 W, with nearly equal pulse and power duration, leads to an average laser power input in the material to be cut of 600 W.

During the oral proceedings the appellant further relied upon Figures 8 and 9 on page 217 and the text on page 218, from which it was clear that the temperature during the pauses was sufficiently high that the material to be cut remained liquid. Therefore considering the disclosure on pages 217 and 218 of D10 the known cutting method complied in detail with the method claimed in claim 1, when considering the alternative according to which the average output power was higher ($P_{\text{mittel}} = 600 \text{ W}$) than the level of the low power sections ($P_{\text{pause}} = 200 \text{ W}$).

Since feature (a) of the pre-characterising portion of claim 1, according to which the subsequent peak pulses exceeded the maximum continuous wave power level of the laser device, was not a process feature it should not be taken into account for assessing novelty of the subject-matter of claim 1.

3.2 The Board follows the appellant's analysis of the disclosure of D10, however comes to the conclusion that feature (a) cannot be ignored because it clearly defines a further requirement of the level of the peak pulses.

The Board considered whether the indication "peak" pulses should be seen as a further difference when compared to the pulses disclosed in D10. It is true that in the drawings of the patent in suit the duration of each of the peak power pulses is less than half the time between the peak power pulses. However, this embodiment concerns a preferred embodiment and is covered by dependent claim 8, which means that the subject-matter of claim 1 should not be considered limited to such an interpretation of "peak" pulses.

Considering the technical content of claim 1, the Board is of the firm opinion that the skilled person would also consider the pulses shown in Figure 8 of D10 to qualify for "peak" pulses because of the large difference (800 W) between the pause power (200 W) and pulse power (1000 W).

- 3.3 In conclusion, in the absence of any indication in D10 about the maximum continuous wave power of the device used in the method described in relation to Figure 8, when comparing the method of processing a material derivable from D10 with the method claimed in claim 1 of the patent in suit, the feature according to which the subsequent peak pulses exceed the maximum continuous wave power of the laser device (feature (a) in claim 1) is not disclosed in D10.

Consequently the subject-matter of claim 1 is novel when compared to the disclosure of D10.

4. *Inventive step*

- 4.1 The problem addressed in D10 is the improvement of performance and quality of the laser cutting (see page 210, first paragraph and page 219, "Conclusions"). This object is comparable with that of the patent in suit, namely, departing from the superpulsing

technique, to provide an improved processing method (see column 2, lines 23 to 25) in particular an optimized quality when laser cutting is carried out at high speeds (see column 2, lines 30 to 33)

4.2 Therefore, since no information about the maximum continuous wave power level of the device known from D10 is available, the remaining objective problem underlying the subject-matter of claim 1 can be seen in the provision of a method of laser material processing using a laser device having a maximum continuous wave power level which is sufficiently high to allow continuous processing at the required speeds.

4.3 This problem is solved by the method according to claim 1 in that the subsequent peak pulses exceed the maximum continuous wave power level of the device. In such a manner a laser device of relatively low continuous wave power level can be used to effect high quality processing at high speeds.

4.4 However, when selecting a laser device for carrying out the method of D10, the skilled person considering the power requirements for the laser and being faced with the presentation of laser power requirements as shown in Figure 8 of D10, would immediately realise that no higher continuous power output of the laser device than P_{mittel} is needed for carrying out the known method. Therefore, simply for reasons of economy, the skilled person would select a laser device having a maximum continuous power level of P_{mittel} to carry out the known method derivable from D10.

Therefore D10, although not novelty destroying, is considered to contain sufficient further information to lead the skilled person in an obvious manner to the method of claim 1 of the patent in suit, which for this reason is deprived of an inventive activity.

4.5 In the absence of any request directed to the preferred embodiments the Board can only decide that the patent has to be revoked in its entirety for lack of inventive step of the subject-matter of claim 1 of the only request filed by the respondent.

4.6 Having arrived at the conclusion that the patent cannot be maintained as granted, at least for reasons of lack of inventive step of the subject-matter of claim 1 when starting from the prior art disclosed in D10, there is no need to examine the alleged prior use for sufficient substantiation or its relevance for the grounds of opposition under Article 100(a) EPC.

5. *Procedural considerations*

5.1 In the present case the Board considers it appropriate to deal with the question whether the Respondent, who did not attend the oral proceedings, has been given sufficient opportunity to present comments on the introduction of D10, the interpretation of the disclosure of D10 and the reasons leading to the decision for revocation based on this late filed document.

5.2 It follows from the file that document D10 was introduced by the Appellant with letter dated 8 December 2000 and at the same time it was explained in detail why this document was considered to be novelty destroying for the subject-matter of claim 1. According to the file the Appellant's letter was sent as a registered letter to the Respondent on 18 December 2000.

No comments from the Respondent to the introduction of this new prior art and the Appellant's interpretation of D10 were received by the Board at any stage of the appeal proceedings.

In its communication dated 28 May 2002, attached to the summons for oral proceedings, the Board explicitly mentioned (see point 5 of the communication) that it would be discussed at the oral proceedings whether the late filed documents (among which D10) should be introduced into the appeal proceedings.

With letter dated 4 February 2003, thus one month before the oral proceedings of 4 March 2003, the Respondent informed the Board of its not attending the oral proceedings and its withdrawal of the auxiliary request for oral proceedings.

- 5.3 This state of affairs shows that the respondent had more than two years prior knowledge of the possibility that D10 would be admitted into the appeal proceedings. Furthermore, in view of the interpretation of D10 given by the Appellant, the Respondent should have been aware of the possibility of revocation of the patent on the basis of the disclosure of D10.

In view of the Respondent's earlier auxiliary request for oral proceedings (see letter dated 1 November 2000) there was no need for the Board to give further procedural guidance in respect of the introduction of D10 other than that admissibility into the proceedings of this newly cited document should be discussed at the oral proceedings, as was done in the Board's communication dated 28 May 2002.

- 5.4 As follows from the reasons given above, the Board could not follow the Appellant's argumentation in respect of lack of novelty based on D10 as presented in the letter dated 9 December 2000 but decided that the subject-matter of claim 1 as granted lacked an inventive step when starting from the prior art disclosed in D10.

In this respect the Board draws attention to the decision G 4/92 (OJ 1994, 149), according to which new arguments based on the evidence previously notified to the party, who does not appear at oral proceedings, may in principle be used to support the reasons for the decision. Therefore the deviation from the reasons for possible revocation of the patent which were known to the Respondent (the alleged lack of novelty of the subject-matter of claim 1) being based on further development of arguments in the context of the same evidence (the selection of the laser device for carrying out the method derivable from D10) is an issue that does not contravene the Respondent's procedural rights as laid down in Article 113(1) EPC (see also point 10 of G 4/92).

- 5.5 The Board is aware of the fact that during the written appeal proceedings much emphasis has been put on the substantiation of the alleged prior use.

However, fact is also that all the objections submitted by the Appellant should be considered individually and that each of them could at any time be further developed during the oral proceedings. Therefore, when withdrawing the auxiliary request for oral proceedings and informing the Board of its non-appearance, the Respondent should have expected that the Board would decide in substance on the patent in its granted form taking into account any piece of evidence filed by the Appellant and arguments based on this evidence, including the situation where the argumentation based on a particular piece of evidence would be further developed during the oral 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:

M. Patin

P. Alting van Geusau