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Datasheet for the decision of 10 May 2019

Case Number: T 0765/15 - 3.4.03

Application Number: 06794993.3

Publication Number: 1949511

IPC: H01S3/11, H01S3/0941, H01S3/16

Language of the proceedings: EN

Title of invention:
TIMING OF A Q-SWITCH TO SUPPRESS PRE-LASING OF THE LASER

Applicant:
LEONARDO MW LTD

Headword:

Relevant legal provisions:
EPC 1973 Art. 84
RPBA Art. 12(2), 12(4)

Keyword:
Amendments of application - consent of examining division (no)
Statement of grounds of appeal - party's complete case
Auxiliary request - contradiction between independent and dependent claims

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 0765/15 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 10 May 2019

Appellant: (Applicant)	LEONARDO MW LTD Christopher Martin Road Basildon, Essex SS14 3EL (GB)
Representative:	Wojcik, Lucy Eleanor Leonardo MW Ltd c/o Impetus IP Limited Suite 31 West Devon Business Park Brook Lane Tavistock Devon PL19 9DP (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 2 October 2014 refusing European patent application No. 06794993.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Eliasson
Members:	M. Stenger
	T. Bokor

Summary of Facts and Submissions

I. The appeal concerns the decision of the Examining Division to refuse European application No. 06794993. The Examining Division did not admit into the proceedings the request filed with letter dated 24 November 2013, resulting in a lack of any text agreed upon by the applicant according to Article 113(2) EPC.
During the procedure before the Examining Division, the Examining Division had also raised other objections, in particular with respect to Articles 54 and 84 EPC.

II. The applicant requested that the contested decision be set aside (notice of appeal dated 9 December 2014).
As a main request, the applicant indicated that the text/the claims submitted with telefax on 21 September 2011 and re-filed with letter dated 23 January 2012 was agreed upon by the applicant (grounds of appeal, page 1, section "Main Request", point 2).
The Board takes it that these claims constitute the subject-matter of the Main Request and, though not explicitly so stated, that the applicant requests the grant of a patent on the basis of this text/these claims as well.
This assumption of the Board was communicated to the applicant in a communication preparing the oral proceedings before the Board.

As an auxiliary request, the applicant requested the grant of a patent according to a claim set and description pages submitted with the grounds of appeal (grounds of appeal, page 1, section "Auxiliary Request", points 3. to 5.).

III. In the communication preparing the oral proceedings, the Board expressed its preliminary opinion that it was inclined not to admit the main request and that claims 1 and 3 of the auxiliary request, particularly in combination with claims 2 and 4 of that request, respectively, were not clear according to Article 84 EPC. In that communication, the Board further came to the preliminary conclusion that the subject-matter of claims 1 and 3 was not new according to Article 54 EPC.

IV. The applicant did not submit any comments relating to the preliminary opinion of the Board. Oral proceedings were held on 10 May 2019 in the absence of the applicant, as announced by letter dated 9 May 2019.

V. The following documents are referred to in this decision:

D1: E. Georgiou et al.: "50 mJ/30 ns FTIR Q-switched diode-pumped Er:Yb:glass 1.54 µm laser", Optics Communications 198 (2001), pages 147-153; XP4308636

D5: S.D. Setzler et al.: "Resonantly Pumped Eyesafe Erbium Lasers", IEEE Journal of selected topics in quantum electronics, Vol. 11, No. 3, May/June 2005; XP11140217

Document D5 was introduced by the Board with the communication preparing the oral proceedings. D5 was cited during the examination procedure of a divisional application of the present application. A copy was annexed to the communication.

VI. Claim 1 of the main request has the following wording:

A method of preventing spatial or spectral beam seeding in a pumped Q-switch laser, comprising the step of delaying the Q-switch trigger by greater than the laser resonator lifetime after the end of the pump pulse for preventing pre-lasing to result in the onset of beam seeding
characterised in that
the pump pulse fall time is less than or equal to 2% of the lasing medium upper state lifetime.

VII. Claim 1 of the auxiliary request is worded as follows:

A method of preventing spatial or spectral beam seeding in a pumped Q-switch laser without prelase detection, the method comprising the step of:
pumping the laser with a pump pulse;
characterized by the step of:
delaying a triggering of the Q-switch by an integer number of laser resonator lifetimes after an end of the pump pulse, the integer number of laser resonator lifetimes including a period during which oscillation of a CW/QCW laser dies,
wherein the pump pulse fall time is less than or equal to 2% of the lasing medium upper state lifetime, and
wherein the delay of the Q-switch is a further 1% of an upper state lifetime of the lasing medium subsequent to the fall of the pump pulse.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

As argued by the Examining Division (see point 1.5 of the contested decision), the applicant filed, in response to the summons to attend the oral proceedings before the Examining Division, an amended set of claims 1 to 7 to *replace* the claims on file (see page 1 of the letter dated 24 November 2013, second paragraph). There is no statement from the applicant in its letter that he wished to maintain the previous claim set on an auxiliary basis or that he wished them restored in case the last filed claims were not to be admitted by the Examining Division. That is, these last filed claims corresponding to the ones submitted with letter dated 21 September 2011 (and considered by the Board as the main request) were no longer agreed upon by the applicant.
Thus, the Board concurs with the Examining Division that there was *no text on file agreed upon by the applicant* after the Examining Division had used its discretion not to admit the claims filed with letter dated 24 November 2013 (point 1.5 of the contested decision).

Furthermore, no reasoning is provided in the grounds of appeal why the claims of the main request should be allowable.
The findings of the decision under appeal, though formally given as reasons of the non-admission of the claims filed with letter dated 24.11.2013, in fact also contain arguments why these claims do not fulfil the requirements of the EPC, in particular relating to Articles 123(2), 84 and 54 EPC (points 1.2.1, 1.2.2 and 1.2.4 of the contested decision).

Since the grounds of appeal do not comprise any reasoning why the claims of the main request would fulfill the requirements of the EPC, the requirements of Article 12(2) RPBA are not met. On this basis, the Board does not admit the main request under Article 12(4) RPBA, last sentence.

3. Auxiliary request

3.1 Clarity

Nd:YAG is the only laser medium example given in the application. Its upper state lifetime is said to be 230 microseconds (page 3, lines 8 to 10). This is consistent with D5, according to which the storage or upper state lifetime of Nd:YAG corresponds to approximately 260 microseconds (page 645, right column, last three lines).

The upper state lifetime of Nd:YAG is, according to D5, short. This statement is in line with the much longer upper state lifetimes of 5 milliseconds of Er:YAG (D5, page 646, left column, first line) and 7 milliseconds of Er:Yb:glass (D1, page 148, penultimate sentence above Figure 1).

Thus, a material that is suitable to be used as an active medium in a laser has an upper state lifetime of roughly between 200 microseconds and 10 milliseconds.

According to claim 1 of the auxiliary request, the Q-switch delay is *1% of the upper state lifetime of the laser medium*. It follows from the above that according to that definition, the Q-switch delay will be roughly between 2 and 100 microseconds.

In contrast to this, claim 2 defines a Q-switch delay of only 10 to 20 nanoseconds. The delay defined in

claim 2 is thus smaller than the one defined in claim 1 by a factor of at least 100, possibly by a factor of up to 10000.

Thereby, claims 1 and 2 contradict each other, although claim 2 depends on claim 1. As a consequence, the claim set of the auxiliary request is unclear according to Article 84 EPC 1973.

3.2 Novelty

The Board notes that the subject-matter of claim 1 further does not comply with the requirements of Articles 52(1) and 54 EPC 1973, either, as set out in the communication sent by the Board in preparation of the oral proceedings (see points 5.2 to 5.6 of that communication).

4. The main request was not admitted into the proceedings. The claims of the auxiliary request do not comply with the requirements of the EPC. Thus, the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Sánchez Chiquero G. Eliasson

Decision electronically authenticated