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Datasheet for the decision of 22 February 2024

Case Number: T 0345/23 - 3.2.01

Application Number: 14764437.1

Publication Number: 2972479

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Language of the proceedings: EN

Title of invention:

METHODS AND SYSTEMS FOR CHARACTERIZING LASER MACHINING PROPERTIES BY MEASURING KEYHOLE DYNAMICS USING INTERFEROMETRY

Patent Proprietor:

IPG Photonics (Canada) Inc.

Opponents:

Lessmüller Lasertechnik GmbH
Sties, Jochen
Spitmann, Knut H.

Headword:

Relevant legal provisions:
EPC Art. 100(c), 123(2)
RPBA 2020 Art. 15(1)

Keyword:
Grounds for opposition - added subject-matter (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0345/23 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 22 February 2024

Appellant: (Patent Proprietor)	IPG Photonics (Canada) Inc. 199 Bay Street, Suite 5300 Commerce Court West, Toronto ON M5L1B9 (CA)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 20 December 2022 revoking European patent No. 2972479 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: A. Pieracci
P. Guntz

Summary of Facts and Submissions

I. An appeal was filed by the patent proprietor in the prescribed form and within the prescribed time limit against the decision of the opposition division to revoke the European patent No. 2 972 479.

II. In preparation for the oral proceedings the Board communicated its preliminary assessment of the case with a communication pursuant to Article 15(1) RPBA.

III. Oral proceedings before the Board took place on 22 February 2024. At the end of the oral proceedings the decision was announced.

IV. The final requests of the appellant (patent proprietor) are:

> that the appealed decision be set aside and the patent be maintained in amended form according to the main request underlying the appealed decision.

V. The final requests of respondents 1, 2 and 3 (opponents 1, 2 and 3) are:

> that the appeal be dismissed or in the alternative, should the decision be set aside, that the case be remitted to the opposition division for further prosecution.

VI. The arguments of the parties are dealt with in detail in the reasons of the decision.

VII. Claim 1 of the patent as amended according to the main request, which is identical to claim 1 of the patent as

granted, reads as follows (features designation according to the decision of the opposition division):

"1. An apparatus comprising:

1.1 a low coherence imaging light source (204) that produces an imaging beam (20) that is applied to a material processing system,

1.2 wherein the material processing system implements a material modification process using a material processing energy source (17) that produces a material processing beam (16) that is applied to the material (12,14), wherein the material processing beam creates a phase change region (PCR) in a material (30, 32, 34);

1.3 at least one directing element (43) that is adapted to direct the imaging beam (20) at a plurality of imaging beam positions (20a-20f, 20i, 20h) within the PCR;

1.4 at least one input-output port (23) that outputs the imaging beam to the material processing system and that receives at least one reflection component of the imaging light reflected from the PCR;

1.5 an optical combiner (214, 322) that combines the reflection component of the imaging light and at least another component of the imaging light to produce an interferometry output, the interferometry output based on an optical path length taken by the imaging beam and the reflection component compared to an optical path length taken by the at least another component of the imaging light; and

1.6 an interferometry output processor (332) that processes the interferometry output to determine at least one characteristic of the PCR;

1.7 wherein the directing element directs the imaging beam to a selected imaging beam position that is behind relative to the processing beam in the PCR in order to obtain a stronger signal from the bottom of the keyhole."

VIII. Claim 1 of the patent as originally filed reads (features designation according to the decision of the opposition division):

"1-o An apparatus comprising:

1.1-o an imaging optical source that produces imaging light that is applied to a material processing system,

1.2-o wherein the material processing system implements a material modification process and creates a phase change region (PCR) in a material;

1.3-o at least one element that directs the imaging light at a plurality of imaging beam positions proximate the PCR;

1.4-o at least one input-output port that outputs a first component of the imaging light to an optical access port of the material processing system and that receives a reflection component of the imaging light;

1.5-o an optical combiner that combines the reflection component and at least another component of the imaging light to produce an interferometry output,

the interferometry output based on a path length taken by the first component and the reflection component compared to a path length taken by the at least another component of the imaging light; and

1.6-o an interferometry output processor that processes the interferometry output to determine at least one characteristic of the PCR."

Reasons for the Decision

1. Added subject-matter of claim 1 of the patent as amended according to the main request (Article 100 c) and 123(2) EPC)

1.1 The patent proprietor contests the finding of added subject-matter of the opposition division.
The opposition division (see the appealed decision, the passage bridging pages 8 and 9 and the fourth complete paragraph of page 9) found that claim 1 of the patent as amended according to the main request, which is identical to claim 1 of the patent as granted, comprises subject-matter extending beyond the content of the application as originally filed among other reasons because feature 1.4 of claim 1 of the main request requires that the input-output port outputs the imaging beam, thus the **whole imaging beam**, while according to feature 1.4-o, i.e. the corresponding feature of the claim as originally filed, **a component of the imaging light** is output.
Claim 1 as originally filed and claim 1 of the main request thus provide a different technical teaching.
The fact that the feature "a component of the imaging light" in feature 1.4-o of claim 1 as originally filed

has been replaced by the feature of "the imaging beam" in the corresponding feature 1.4 of claim 1 of the main request (corresponding to claim 1 as granted in this respect) has also been contested by the opponents in appeal proceedings (see for example the reply to the statement setting out the grounds of appeal of opponent 3, page 7, last two paragraphs).

1.2 The patent proprietor argued that claim 1 of the application as originally filed in features 1.1-o and 1.3-o indicates that "imaging light" is applied whereas in feature 1.4-o "a first component of the imaging light" is mentioned. Since the "light" mentioned in these features should be the same, an ambiguity is present in the original claim. Claim 1 of the application as originally filed should thus be interpreted to overcome said ambiguity and to assess whether it provides a basis for claim 1 of the main request. The person skilled in the art would then understand by interpreting the claim, so the patent proprietor, that, albeit a different wording has been used, no technical information has been added in claim 1 of the main request with respect to the application as originally filed.

1.3 The Board cannot follow the argumentation of the patent proprietor and rather shares the view of the opponents. It is agreed with the patent proprietor that claim 1 of the application as originally filed does not provide a clear and unambiguous teaching.
However for the very reason of its ambiguity said claim cannot provide a direct and unambiguous disclosure of the subject-matter of claim 1 according to the main request, in particular in respect of the above-mentioned feature that the input-output port outputs the whole imaging beam (rather than a first component

of the imaging light). Moreover, the ambiguity in claim 1 as originally filed cannot be resolved by reading feature 1.4-o (in combination with feature 1.3-o) in the sense of providing a disclosure of the feature that the input-output port outputs the whole imaging beam, insofar the description, which is to be taken into account when assessing the disclosure of the application as filed taken as a whole, clearly shows (see in particular the embodiments of Figs. 8 and 9) that it is only a first component of the imaging light that is output by the input-output port.
Since no other basis has been submitted by the patent proprietor for the amendments of feature 1.4 of claim 1, nor such a basis is apparent to the Board, it is concluded that said feature adds subject-matter extending beyond the content of the application as originally filed.

1.4 As a consequence there is no need for the Board to address all the other issues of added subject-matter disputed by the parties.

2. Conclusions

In view of the above finding the appeal cannot be allowed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

H. Jenney G. Pricolo

Decision electronically authenticated