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Ihr Zeichen
09035WO00

Unser Zeichen
IP130WO

Datum
23.07.2010

PCT-Anmeldung: "Multi-segment all-fiber laser" vom 31.03.2010 basierend auf der US Provisional Nr. 61/211,860 vom 02.04.2009; amtliches Aktenzeichen: PCT/EP 2010/002176; Anmelder: Humboldt-Universität zu Berlin et al. *Uwe Fischer*

Sehr geehrter Herr Dr. Haselton,

in Sachen der oben bezeichneten internationalen Patentanmeldung haben wir jetzt den internationalen Recherchenbericht und einen schriftlichen Bescheid zur Schutzfähigkeit der beanspruchten Erfindung erhalten, die wir Ihnen zusammen mit den im Recherchenbericht genannten Dokumenten zum Stand der Technik zur Kenntnis- und gegebenenfalls zur Stellungnahme beifügen.

Der internationale Recherchenbericht benennt die Dokumente, die bei einer Prüfung der internationalen Patentanmeldung bzw. bei den regionalen (Europäisches Patentamt) oder nationalen Patentämtern der Bestimmungsstaaten zu berücksichtigen sind. Je nach Bedeutung der Dokumente werden entweder die ursprünglich eingereichten Patentansprüche weiterverfolgt oder neue und gegenüber den Dokumenten des Recherchenberichtes eingeschränkte Patentansprüche eingereicht. Im ungünstigsten Fall kann es empfehlenswert sein, auf die Weiterverfolgung der internationalen Patentanmeldung zu verzichten.

Zur Erleichterung der Überprüfung der Bedeutung der einzelnen Dokumente des internationalen Recherchenberichtes sind diese in Kategorien eingeteilt, wobei den Dokumenten, die der Kategorie "X" zugeordnet wurden, besondere Bedeutung zukommt, da sie dem Gegenstand der Erfindung möglicherweise unmittelbar entgegenstehen. Die der Kategorie "Y" zugeordneten Dokumenten sind in Verbindung mit anderen im internationalen Recherchenbericht genannten Dokumenten von Bedeutung, während die der Kategorie "A" zugeordneten Dokumente als technologischer Hintergrund anzusehen sind, so dass diese Dokumente nur Bedeutung in Verbindung mit Dokumenten haben, der der Kategorie "X" oder "Y" zugeordnet wurden, für sich betrachtet aber kein Patentierungshindernis darstellen.

Der dem internationalen Recherchenbericht beigelegte schriftliche Bescheid nimmt auf der Grundlage der im internationalen Recherchenbericht angegebenen Dokumente Stellung zur Schutzfähigkeit, d. h. zur Neuheit, erfinderischen Tätigkeit und gewerblichen Anwendbarkeit der vorliegenden internationalen Patentanmeldung.

I. Ergebnis der internationalen Recherche und bisherigen Prüfung

Bei der internationalen Recherche wurden vier Dokumente zum Stand der Technik ermittelt, von denen drei der Kategorie "X" und eins der Kategorie "A" zugeordnet wurden.

Die Ansprüche, für die die Dokumente jeweils als relevant angesehen werden, sind in der dritten Spalte des Recherchenberichts angegeben.

In dem internationalen Recherchenbericht beigefügten schriftlichen Bescheid werden die Ansprüche 8, 10 und 11 zwar als neu betrachtet, jedoch wird das Vorliegen einer erfinderischen Tätigkeit in Abrede gestellt.

Es ist nun nach eingehender Prüfung des internationalen Recherchenberichtes und der darin genannten Dokumente zu entscheiden, ob eine internationale vorläufige Prüfung der internationalen Patentanmeldung auf Patentfähigkeit vor Einleitung der nationalen bzw. regionalen Phasen der internationalen Patentanmeldung erfolgen soll. Eine solche Prüfung ist fakultativ.

II. Weiteres Vorgehen

Der Antrag auf internationale vorläufige Prüfung der Patentanmeldung kann bis zum

02.02.11

gestellt werden.

Unabhängig von der Stellung dieses Antrages muss die Einleitung in die nationalen bzw. regionalen Phasen innerhalb von 30 Monaten ab dem Anmelde- bzw. Prioritätsdatum, d.h. bis zum

02.10.11

vorgenommen werden.

Eine Durchsicht und Prüfung der im internationalen Recherchenbericht aufgeführten Dokumente zum Stand der Technik wurde von unserer Seite noch nicht vorgenommen. Falls dies erfolgen soll, erbitten wir Ihre diesbezügliche Weisung. Andernfalls warten wir auf Ihre Stellungnahme zur Frage, ob ein Antrag auf internationale vorläufige Prüfung gestellt werden soll oder nicht.

Falls Sie an der Stellung eines Antrages auf internationale vorläufige Prüfung interessiert sind, bitten wir Sie gleichzeitig um Ihre Stellungnahme zu dem schriftlichen Bescheid, zu dem wir uns spätestens bei Stellung des Prüfungsantrages inhaltlich äußern müssen.

Im Übrigen besteht die Möglichkeit, auch ohne Stellung eines Prüfungsantrages allein die Patentansprüche nach Art. 19 PCT-Vertrag zu ändern. Die Frist hierzu endet am

15.09.10

Falls Sie von dieser Möglichkeit Gebrauch machen wollen, bitten wir Sie um eine entsprechende Nachricht.

Unsere in dieser Sache entstandenen Kosten erlauben wir uns, mit der beigefügten Liquidation abzurechnen.

Mit freundlichen Grüßen



Dr. Uwe Fischer
Patentanwalt

Anlagen (nur per Post):

Recherchenbericht
Stand der Technik
Schriftlicher Bescheid
Liquidation (2-fach)
Antwortblatt

PATENT COOPERATION TREATY

Recherchenbericht
-> Mitteilung

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
FISCHER, Uwe
Moritzstrasse 22
D-13597 Berlin
ALLEMAGNE

Dr.-Ing. Uwe Fischer
Eingegangen
15. Juli 2010
29.7.10
Frist: 15.9.10
Geprüft: Ju

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year)	15 July 2010 (15-07-2010)
Applicant's or agent's file reference IP130WO	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/EP2010/002176	International filing date (day/month/year) 31 March 2010 (31-03-2010)
Applicant HUMBOLDT-UNIVERSITÄT ZU BERLIN	

1. The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see the notes on the accompanying sheet.

2. The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040
Fax: (+31-70) 340-3016

Authorized officer

BIANCONI, Sandrine
Tel: +49 (0)89 2399-2269

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annex B).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, International Phase, paragraph 296).

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet or sheets containing a complete set of claims in replacement of all the claims previously filed must be submitted.

Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively in Arabic numerals (Section 205(a)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1 *bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, National Chapters.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference IP130WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2010/002176	International filing date (day/month/year) 31/03/2010	(Earliest) Priority Date (day/month/year) 02/04/2009
Applicant HUMBOLDT-UNIVERSITÄT ZU BERLIN		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed
- a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant
- the text has been established by this Authority to read as follows:

LINEAR MODE-LOCKED DFB-FIBER LASER WITH REPETITION RATE CONTROL

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

- as suggested by the applicant
- as selected by this Authority, because the applicant failed to suggest a figure
- as selected by this Authority, because this figure better characterizes the invention

b. none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2010/002176

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

An embodiment of the invention relates to a multi-segment all-fiber laser device (10). The device includes a first active fiber laser segment (20), a first grating (25), a second grating (35), and a gain-phase coupling fiber segment (40) arranged between the first and second gratings, said gain-phase coupling segment providing coupling of gain and phase between said first and second gratings.

The second grating may be provided in a second active fiber laser segment (30) and the phase may be adjusted by a control pump source (70).

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/002176

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01S3/067 H01S3/11
ADD. H01S3/08 H01S3/102

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
① X	US 5 936 980 A (ESPINDOLA ROLANDO PATRICIO [US] ET AL) 10 August 1999 (1999-08-10) column 2, line 15 - column 5, line 11; figure 1	1-15
② X	----- BARMENKOV Y O ET AL: "Threshold of a Symmetrically Pumped Distributed Feedback Fiber Laser With a Variable Phase Shift" IEEE JOURNAL OF QUANTUM ELECTRONICS, IEEE SERVICE CENTER, PISCATAWAY, NJ, USA LNKD-DOI:10.1109/JQE.2008.923555, vol. 44, no. 8, 1 August 2008 (2008-08-01), pages 718-723, XP011227500 ISSN: 0018-9197 page 718, right-hand column - page 719, right-hand column; figures 1,2,7 page 721, right-hand column - page 722, left-hand column ----- -/--	1-4,9-13

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

6 July 2010

Date of mailing of the international search report

15/07/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Laenen, Robert

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/002176

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
3 X	US 2009/067456 A1 (VILLENEUVE ALAIN [CA] ET AL) 12 March 2009 (2009-03-12) paragraph [0023] - paragraph [0049]; figures 1,2	1-9, 12, 14
4 A	----- YUAN-HWANG LIAO ET AL: "Dynamics of distributed-feedback fiber lasers: effect of nonlinear refraction" OPTICS LETTERS, OSA, OPTICAL SOCIETY OF AMERICA, WASHINGTON, DC, US, vol. 21, no. 7, 1 April 1996 (1996-04-01), pages 471-473, XP009135748 ISSN: 0146-9592 the whole document -----	1, 2, 6, 12, 15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2010/002176

Patent document cited in search report	Publication date	Publication date	Patent family member(s)	Publication date
US 5936980	A	10-08-1999	US 5933438 A	03-08-1999
US 2009067456	A1	12-03-2009	CA 2695953 A1	12-02-2009
			WO 2009018664 A2	12-02-2009
			EP 2183829 A2	12-05-2010

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2010/002176

International filing date (day/month/year)
31.03.2010

Priority date (day/month/year)
02.04.2009

International Patent Classification (IPC) or both national classification and IPC
INV. H01S3/067 H01S3/1
ADD. H01S3/08 H01S3/02

Applicant
HUMBOLDT-UNIVERSITÄT ZU BERLIN

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Laenen, Robert

Telephone No. +49 89 2399-6031



Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - on paper
 - in electronic form
 - b. (time)
 - in the international application as filed
 - together with the international application in electronic form
 - subsequently to this Authority for the purposes of search
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. II Priority

1. The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>8, 10, 11</u>
	No: Claims	<u>1-7, 9, 12-15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 Reference is made to the following documents:
- D1 US 5 936 980 A (ESPINDOLA ROLANDO PATRICIO [US] ET AL) 10 August 1999 (1999-08-10)
- D2 BARMENKOV Y O ET AL: "Threshold of a Symmetrically Pumped Distributed Feedback Fiber Laser With a Variable Phase Shift" IEEE JOURNAL OF QUANTUM ELECTRONICS, IEEE SERVICE CENTER, PISCATAWAY, NJ, USA LNKD- DOI:10.1109/JQE.2008.923555, vol. 44, no. 8, 1 August 2008 (2008-08-01) , pages 718-723, XP011227500 ISSN: 0018-9197
- D3 US 2009/067456 A1 (VILLENEUVE ALAIN [CA] ET AL) 12 March 2009 (2009-03-12)
- D4 YUAN-HWANG LIAO ET AL: "Dynamics of distributed-feedback fiber lasers: effect of nonlinear refraction" OPTICS LETTERS, OSA, OPTICAL SOCIETY OF AMERICA, WASHINGTON, DC, US, vol. 21, no. 7, 1 April 1996 (1996-04-01) , pages 471-473, XP009135748 ISSN: 0146-9592
- 2 The subject-matter of claims 1-7, 9, 12,14,15 is not new in the sense of Article 33 (2) PCT.
- 2.1 D1 discloses a multi-segment all-fiber laser device (Fig. 1; col. 2, l. 15 - col. 5, l. 11) including
a first active fiber laser segment A2 (Fig. 1; col. 4, l. 5-49; *D1 discloses pumping by a LD 2*);
a first grating G2 (Fig. 1; col. 3, l. 54-59 and col. 4, l. 50-60; *D1 discloses a DFB grating G2*);
a second grating G3 (Fig. 1; col. 3, l. 61 and col. 4, l. 50-59; *D1 discloses G3 to be a FBG*); and
a gain-phase coupling fiber segment 8,20 arranged between the first and second gratings G2,G3, said gain-phase coupling segment 8,20 providing coupling of gain and phase between said first and second gratings G2,G3

(Fig. 1; col. 3, l. 1-66; D1 discloses two gain-phase coupling devices: a modulator 8 modulating the refractive index via a nonlinear optical fiber (Kerr-effect; D4 (Fig. 2; p. 471-472) discloses that via the Kerr-effect stable self-pulsing of a DFB fiber laser is possible) and a fiber coupler 20 coupling the second laser with active fiber A1 and pump LD1 to the first laser having active medium A2 and by adjusting amplitude and wavelength of the second laser phase locking to the first laser is realized).

Therefore, the subject-matter of claims 1-3,5-7,9 is not new in the sense of Article 33 (2) PCT.

- 2.2 Besides the device as defined in claims 1-3,5-7,9 D1 discloses also the method of emitting radiation pulses and or pulse trains as defined in claims 12,14,15 (see above; D1 discloses emission of pulses (col. 1, l. 26-33) and modulation via the pumping of the coupled second laser or via the Kerr-effect which is implicitly known to be determined inter alia by the intensity of the circulating pulse).

Therefore, the subject-matter of claims 12,14,15 is not new in the sense of Article 33 (2) PCT.

- 2.3 D2 discloses an all-fiber laser device as defined in claims 1-4,9,12 (Figs. 1,2,7; p. 718, rh col. - p. 719, rh col. and p. 721, rh col. - p. 722, lh col.; D2 discloses two DFB fiber lasers coupled by fiber phase shift section with the phase shift being controlled by an external magnetic field and this phase-shift determines the coupling between phase and gain of the two DFB fiber lasers).

Therefore, the subject-matter of claims 1-4,9,12 is not new in the sense of Article 33 (2) PCT.

- 2.4 D3 discloses an all-fiber laser device as defined in claims 1,2,9,12 (Figs. 1,2; par. 23-49; D3 discloses a fiber laser comprising two FBG 30,32, an active fiber laser segment 18, pump source 14 and modulator 22 having a controller 42, modulator 22 periodically absorbing a portion of circulating laser light thereby coupling phase and gain).

Therefore, the subject-matter of claims 1,2,9,12 is not new in the sense of Article 33 (2) PCT.

- 3 Dependent claims 8,10,11,13 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to inventive step, the reasons being as follows:

A laser device as defined in claims 1,7 and a method of operating such a laser as defined in claim 12 is known from D1 (see above).

D1 discloses a pump light LD1 as a control pump source and it is obvious by itself to stabilize the coupled laser with the help of a controller.

Temperature stabilisation of coupling elements made by fibers is obvious by itself and known from laser textbooks in order to stabilize the laser and this can therefore not involve an inventive step.

Therefore, the subject-matter of claims 8,10,11,13 does not involve an inventive step in the sense of Article 33 (3) PCT.

Re Item VIII

Certain observations on the international application

The application does not meet the requirements of Art. 6 PCT.

Claims 1,12 comprise a gain-phase coupling fiber segment providing "**coupling of gain and phase between said first and second gratings**" thereby rendering the subject-matter of claims 1,12 unclear as it is left completely undefined, which gain resulting from which medium is coupled to the phase of what.

A grating itself has no "gain" or "phase". Only the light being diffracted by a grating may be amplified in the case of a DFB laser and the diffracted light has a phase relationship to the input light to be diffracted.

In order to examine the subject-matter of the claims, the objected term is interpreted as if a phase relationship ("phase locking") is introduced by said element on the light circulating between the two gratings in the laser and being amplified by the first active fiber laser element.

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information

For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.

Amending claims under Art. 19 PCT

Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.

Filing a demand for international preliminary examination

In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).

If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).

Filing informal comments

After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.

End of the international phase

At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).

Relevant PCT Rules and more information

Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

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