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**Datasheet for the decision
of 1 June 2021**

Case Number: T 2885/18 - 3.4.02

Application Number: 09804732.7

Publication Number: 2312348

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G02B6/02, G02B6/024, G02B6/036,
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Language of the proceedings: EN

Title of invention:

YTTERBIUM-DOPED OPTICAL FIBER, FIBER LASER, AND FIBER AMPLIFIER

Patent Proprietor:

Fujikura, Ltd.

Opponent:

Heraeus Quarzglas GmbH & Co.KG

Relevant legal provisions:

EPC Art. 54(1), 56
RPBA Art. 12(2), 12(4)
RPBA 2020 Art. 12(3), 13(1), 13(2)

Keyword:

Admittance of new allegation of fact on appeal (no)

Admittance of amendment to a party's appeal case (no)

Novelty (main request: no; first auxiliary request: yes)

Inventive step (first auxiliary request: no)

Admission of new requests (second to sixth auxiliary requests:
no)



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Case Number: T 2885/18 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 1 June 2021

Appellant: Fujikura, Ltd.
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 8 October 2018
revoking European patent No. 2312348 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: F. J. Narganes-Quijano
B. Müller

Summary of Facts and Submissions

- I. The patent proprietor (appellant) lodged an appeal against the decision of the opposition division revoking European patent No. 2312348.

The opposition filed by the opponent (respondent) was based on the grounds for opposition of added subject-matter (Article 100 (c) EPC), insufficiency of disclosure (Article 100 (b) EPC), and lack of novelty and of inventive step (Article 100 (a), together with Articles 52 (1), 54 (1) and 56 EPC).

- II. During the appeal proceedings the parties have referred, among other documents, to the following document already considered during the first-instance proceedings:

E7: WO 2008/061530 A1

In its decision the opposition division held *inter alia* that the subject-matter of claim 1 of the main and the auxiliary request then on file was not new in view of the disclosure of document E7.

- III. With the statement setting out the grounds of appeal the appellant submitted claims according to a main and first to sixth auxiliary requests and two affidavits in support of the submissions relating to the meaning of the feature "equivalent concentration" used in the patent specification.

- IV. In a communication annexed to the summons to oral proceedings the board presented a preliminary assessment of the case.
- V. With the letter dated 30 April 2021 the appellant filed amended claims according to a main and first to sixth auxiliary requests and further evidence in support of the submissions relating to the meaning of the feature "equivalent concentration" used in the patent specification.
- VI. Oral proceedings were held before the board on 1 June 2021.

The appellant requested that the decision under appeal be set aside and that the European patent be maintained in amended form on the basis of the claims of the main request or the first to sixth auxiliary requests, all filed with the letter dated 30 April 2021.

The respondent requested that the appeal be dismissed.

At the end of the oral proceedings the chairman announced the decision of the board.

- VII. Claim 1 of the main request reads as follows:

"An ytterbium-doped optical fiber comprising:
a core which contains at least ytterbium, aluminum, and phosphorus; and
a cladding which encircles the core, wherein
an aluminum oxide equivalent concentration of the aluminum in the core is 0.2 mol% or more;
a diphosphorus pentoxide equivalent concentration of the phosphorus is higher than the aluminum oxide equivalent concentration; and

the core does not contain germanium,
wherein the diphosphorus pentaoxide equivalent concentration in the core is in the range of 1.05 to 11.5 times a summation of an ytterbium oxide equivalent concentration of the ytterbium and the aluminum oxide equivalent concentration in the core,
the ytterbium oxide equivalent concentration in the core is in a range of 0.01 to 1.0 mol%,
a relative refractive index difference between the core and the cladding is in a range of 0.05 to 0.65%,
and
the core does not contain erbium."

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the feature "and the core does not contain erbium" at the end of the claim is replaced by "the core does not contain erbium, and the core further contains boron".

Claim 1 of the second auxiliary request differs from claim 1 of the first auxiliary request in that the feature "and the core further contains boron" at the end of the claim is replaced by "the core further contains boron, and B₂O₃ equivalent concentration in the core is in a range of 0.01 to 5 mol%".

Claim 1 of the third auxiliary request differs from claim 1 of the second auxiliary request in that the feature "and B₂O₃ equivalent concentration in the core is in a range of 0.01 to 5 mol%" at the end of the claim is replaced by "and B₂O₃ equivalent concentration in the core is in a range of 0.05 to 1 mol%".

Claim 1 of the fourth auxiliary request differs from claim 1 of the third auxiliary request in that the feature "and B₂O₃ equivalent concentration in the core

is in a range of 0.05 to 1 mol%" at the end of the claim is replaced by "B₂O₃ equivalent concentration in the core is in a range of 0.05 to 1 mol%, and the core further contains fluorine, wherein the fluorine is doped in the core within a concentration range of 0.05 to 3 mol%".

Claim 1 of the fifth auxiliary request differs from claim 1 of the fourth auxiliary request in that the feature "a relative refractive index difference between the core and the cladding is in a range of 0.05 to 0.65%" is replaced by "a relative refractive index difference between the core and the cladding is in a range of 0.05 to 0.25%", and

- the feature "the core further contains fluorine, wherein the fluorine is doped in the core within a concentration range of 0.05 to 3 mol%" at the end of the claim is replaced by "the core further contains fluorine, wherein preferably the fluorine is doped in the core within a concentration range of 0.05 to 3 mol%".

Claim 1 of the sixth auxiliary request differs from claim 1 of the fifth auxiliary request in that the feature "and the core further contains fluorine, wherein preferably the fluorine is doped in the core within a concentration range of 0.05 to 3 mol%" at the end of the claim is replaced by "the core further contains fluorine, wherein preferably the fluorine is doped in the core within a concentration range of 0.05 to 3 mol%, and wherein the cross-sectional shape of the cladding in a radial direction of the optical fiber has a non-circular shape".

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 Admission

The claims of the present main request differ from the claims of the main request filed with the statement of grounds of appeal in that the term "times" already present in claim 1 of the main request underlying the decision under appeal has been reinstated in claim 1, in that the term "disphosphorus" of claim 1 has been corrected to read "diphosphorus", and in that dependent claims 2 to 4 and 10 filed with the statement of grounds of appeal have been deleted.

The mentioned amendments were made in reply to objections raised by the board under Article 84 and Rule 80 EPC in the communication annexed to the summons to oral proceedings. In addition, as a result of the amendments, claim 1 of the present main request is identical to claim 1 of the main request underlying the decision under appeal.

In view of these considerations, the board considered appropriate to admit the claims of the present main request into the proceedings (Articles 13 (1) and 13 (2) RPBA 2020).

2.2 In its decision the opposition division held that the subject-matter of claim 1 of the main request was not new in view of the disclosure of document E7, and in

particular in view of each of Examples 1 and 2 disclosed on pages 14 and 15 of the mentioned document.

During the appeal proceedings the appellant submitted that

- the opposition division's finding that the claimed values of the equivalent concentration of the oxides specified in claim 1 were anticipated by the corresponding values of Examples 1 and 2 of document E7 was based on an incorrect understanding of the claimed expression "equivalent concentration", and

- the claimed value of the relative refractive index difference between the core and the cladding was not directly and unambiguously derivable from Examples 1 and 2 of document E7, and that for these reasons the subject-matter of claim 1 of the main request was new over the disclosure of document E7.

2.3 Interpretation of the expression "equivalent concentration" of oxides - Admission

2.3.1

Both the patent as granted and the English translation of the application as originally filed (in the following referred to as "the application as filed") refer to the "equivalent concentration" in units of mol% of oxides present in the core of a doped optical fiber (see, for instance, the expressions "an aluminum oxide equivalent concentration of the aluminum in the core is 0.2 mol% or more", "less than 1.1 mol% of germanium in a germanium dioxide equivalent concentration", and "the diphosphorus pentaoxide equivalent concentration in the core is [...] " in claim 1 as granted), and also to the concentration of the corresponding oxide metal in atomic percent (mol%) (see, for instance, paragraph [0036], last sentence, of

the patent specification, and the corresponding passage of the application as filed). In addition, neither the claims nor the description of the patent as granted and of the application as filed contain an explicit definition of the "equivalent concentration" of the oxides.

However, the passages of the patent specification in the last sentence of each of paragraphs [0036], [0039] and [0040], and in the second sentence of paragraph [0052], and also the corresponding passages of the application as filed, specify the relationship between the "equivalent concentration" of the oxide in mol% and the corresponding concentration of the oxide metal in mol% (atomic percent). According to this relationship (see, for instance, "This range of 0.2 to 12 mol% of the Al_2O_3 equivalent concentration corresponds to a range of 0.08 to 4.8 mol% (atomic percent) as a consequence of Al in the core." in the last sentence of paragraph [0036] of the patent specification) the "equivalent concentration" in mol% of the oxides does not correspond to the conventional or actual concentration of the oxides, but to an "equivalent" value of the concentration in mol% directly derived from the atomic percent in mol% of the respective metal using the factor of proportionality determined by the stoichiometric formula of the corresponding oxide (i.e. a factor of 2/5 in the case of Al_2O_3 , a factor of 2/7 in the case of P_2O_5 , a factor of 2/5 in the case of Yb_2O_3 , and a factor of 1/3 in the case of GeO_2 , see the corresponding values in the mentioned passages of the patent and of the application as filed cited above), i.e. using the so-called rule-of-three as mentioned in the first-instance proceedings and in the decision under appeal.

In addition, during the first-instance proceedings the expression "equivalent concentration" was interpreted as mentioned above, the opposition division followed this interpretation in the decision under appeal as being derivable from, and consistent with, the disclosure of the patent specification (see reasons for the decision, points 32 and 33), and there is no record in the file that the appellant had contested this interpretation during the first-instance proceedings.

- 2.3.2 With the statement of grounds of appeal the appellant contested for the first time during the proceedings the interpretation of the feature "equivalent concentration" mentioned above, and submitted that
- the values of the atomic concentration of the oxide metals in mol% given in the description of both the patent specification and the application as filed were based on a calculation accidentally made and were always presented as secondary additional information, and that the corresponding passages contained unintended information;
 - the term "equivalent" was not used as a technical term, but as synonymous with "corresponding", and the technical meaning of the values of the "equivalent concentration" of the oxides was as explained in detail in the statement of grounds of appeal (*cf.* sections I. 1.A to I.1.C on pages 6/30 to 20/30) and as also explained in the affidavits filed therewith; and
 - consequently, the conversion between the values of the equivalent concentration in mol% of the oxides and the values of the concentration in mol% of the corresponding metal could not be achieved by a simple proportionality factor obtained by the rule-of-three as assumed by the opposition division in the decision under appeal.

With the letter dated 30 April 2021 the appellant submitted further arguments and documentary evidence in support of the interpretation of the feature "equivalent concentration" previously submitted with the statement of grounds of appeal.

The respondent for its part submitted that the submissions of the appellant, apart from not being convincing and amounting to a shift of the construction of the claimed subject-matter (Articles 123 (2) and (3) EPC), constituted a new allegation of fact that should not be considered in appeal for being late filed.

- 2.3.3 The board first notes that the appellant's submissions (point 2.3.2 above, first paragraph) amount to considering the relationship between the "equivalent concentration" of the oxides in mol% and the corresponding concentration of the oxide metal in mol% specified in the passages of the patent specification in the last sentence of each of paragraphs [0036], [0039] and [0040], and in the second sentence of paragraph [0052], and also in the corresponding passages of the application as filed, as incorrect or erroneous. In addition, the submissions, and in particular the calculations, filed by the appellant in respect of the meaning of the "equivalent concentration" of the oxides amount to considering the "equivalent concentration" of the oxides in mol% as consisting of the conventional or actual concentration of the oxides in mol %, i.e. to considering the term "equivalent" as being devoid of any specific technical meaning.

With these submissions, however, the appellant was disputing for the first time during the proceedings the technical meaning of the expression "equivalent

concentration" submitted by the respondent during the first-instance proceedings and subsequently followed by the opposition division. Consequently, the appellant's submissions in this respect, and in particular the new interpretation of the expression "equivalent concentration" submitted by the appellant, amount to a new allegation of fact that was not submitted or addressed during the first-instance proceedings.

According to Article 12 (2) RPBA 2020 (which applies in the present case, see Article 25 (1) RPBA 2020) "[i]n view of the primary object of the appeal proceedings to review the decision under appeal in a judicial manner, a party's appeal case shall be directed to the [...] facts [...] on which the decision under appeal was based", and according to Article 12 (4) EPC 2007 (which applies in the present case, see Article 25 (2) RPBA 2020) it is within "the power of the Board to hold inadmissible facts [...] which could have been presented [...] in the first instance proceedings". In the circumstances of the present case the board considers it appropriate to not admit the new allegation of fact submitted by the appellant into the proceedings. It is noted, in particular, that

- the interpretation of the claimed expression "equivalent concentration" as being derivable from, and being consistent with, the description of both the patent specification and the application as filed was expressly and extensively addressed during the first-instance oral proceedings (see minutes, points 28 to 30), and the appellant declined to comment on the mentioned interpretation (see minutes, point 31), and that

- the mentioned interpretation was - as submitted by the respondent - not addressed for the first time during the first-instance oral proceedings, but was

already addressed during the previous written proceedings (see, in particular, notice of opposition, paragraph bridging pages 4 and 5).

Consequently, the appellant already had ample opportunity during the first-instance proceedings to contest the mentioned interpretation by the respondent and to submit the new interpretation presented for the first time with the statement of grounds of appeal.

For these reasons, the board, in the exercise of its discretion under Article 12 (4) RPBA 2007, decided not to admit into the appeal proceedings the new allegation of fact submitted by the appellant.

- 2.3.4 Since the new allegation of fact is not admitted into the proceedings, the same applies to the arguments and to the evidence submitted by the appellant with the statement of grounds of appeal in support of the new allegation of fact. The same applies to the additional evidence and to the further arguments subsequently filed by the appellant with the letter dated 30 April 2021 after the notification of the summons to oral proceedings, because they are linked to the facts.

With the letter dated 30 April 2021 and during the oral proceedings the appellant submitted that the appellant was taken by surprise during the first-instance oral proceedings when the respondent submitted that document E7 was novelty destroying under its interpretation of the expression "equivalent concentration", and that the comments presented by the board in the communication annexed to the summons constituted exceptional circumstances within the meaning of Article 13 (2) RPBA 2020 justifying the admission of the submissions filed with the letter dated 30 April 2021.

However, as already noted in point 2.3.3, the interpretation of the expression "equivalent concentration" followed by the opposition division in its decision was already expressly and extensively addressed during the first-instance proceedings. In addition, the appellant did not indicate any specific new issue addressed by the board in its communication that would justify under Article 13 (1) and (2) RPBA 2020 the admission of the corresponding submissions. In particular, the mere fact that the board in its communication expressed the preliminary opinion that the new submissions presented with the statement of grounds of appeal might not be admissible or, if admitted, not persuasive is not a reason that would justify the admission into the proceedings of the corresponding further submissions filed with the letter dated 30 April 2021 - let alone the admission of the new allegation of fact itself.

2.4 Submissions in respect of the claimed feature relating to the relative refractive index - Admission

2.4.1 In its decision the opposition division held that the claimed value 0.05 to 0.65% of the relative refractive index difference between the core and the cladding was anticipated by each of Examples 1 and 2 of document E7, and the opposition division based its conclusion in this respect on the evidence and arguments presented by the respondent.

With its letter dated 30 April 2021 filed in reply to the board's communication annexed to the summons to oral proceedings the appellant submitted for the first time during the proceedings that the relative refractive index difference between the core and the cladding was not disclosed in document E7 and only

derived indirectly by the respondent. In particular, the respondent presented different results of calculations differing in the value of the relative refractive index difference of the optical fiber of Examples 1 and 2 of document E7 (0.572% and 0.620%, respectively, according to the results presented with the letter dated 15 February 2017, and 0.137% and 0.275%, respectively, according to the results presented with the letter dated 14 June 2019), and argued that the mentioned values could considerably be affected by various factors (manufacturing conditions, presence of dopants, etc.). Consequently, it was possible to arrive at different values and also at values falling outside the claimed range, and there was no evidence that would allow the conclusion that the claimed value of the relative refractive index difference between the core and the cladding could be directly and unambiguously derived from the disclosure of document E7.

The respondent submitted that the submissions of the appellant in this respect were filed late and should therefore not be admitted into the appeal proceedings.

- 2.4.2 The board notes that, during the first-instance proceedings, the respondent submitted calculations showing that the value of the relative refractive index difference between the core and the cladding of Examples 1 and 2 of document E7 fell within the claimed range of values, the opposition division followed the respondent's submissions in this respect, and the submissions filed by the appellant before the notification of the summons to the oral proceedings before the board were silent as to this issue. It is also noted that according to Article 12 (3) RPBA 2020 (which applies in the present case, see Article 25 (2)

RPBA 2020) - and also according to Article 12 (2) RPBA 2007 valid at the time of filing of the statement of grounds of appeal - "[t]he statement of grounds of appeal and the reply shall contain a party's complete case", and that the statement of grounds of appeal contested the opposition division's finding of lack of novelty of claim 1 only on the grounds that document E7 did not disclose the claimed values of the equivalent concentration of the oxides. Therefore, the appellant's submissions under consideration (point 2.4.1 above, second paragraph) constitute a new allegation of fact presented for the first time during the appeal proceedings with the letter dated 30 April 2021, i.e. after notification of the summons to oral proceedings.

In addition, the new allegation of fact constitutes an amendment to the appellant's appeal case within the meaning of Article 13 (2) RPBA 2020. According to this article, "[a]ny amendment to a party's appeal case made after [...] notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned". In the circumstances of the present case the board sees no reason that would justify admitting into the proceedings the mentioned amendment to the appellant's appeal case submitted with the letter dated 30 April 2021. In particular, the results of the calculations were - as submitted by the respondent - addressed during the first-instance oral proceedings (minutes, page 7, lines 18 and 19, and lines 24 and 25), not contested by the appellant, and subsequently adopted by the opposition division in its decision (reasons, point 32, second and third paragraphs). The submissions filed by the appellant before the notification of the summons to oral

proceedings before the board were silent as to the issue now under consideration. In addition, the board does not see in its communication annexed to the summons any element that would justify, as a reaction, the mentioned submissions. More particularly, the fact that the board noted in its communication that "the issue of novelty over document E7 depends on whether the appellant's submissions relating to the interpretation of the claimed subject-matter [i.e. to the interpretation of the expression "equivalent concentration"] are admitted into the proceedings and found persuasive" does not constitute such an element.

- 2.4.3 In view of these considerations, the board did not admit into the proceedings the amendment to the appellant's appeal case relating to the claimed value of the relative refractive index difference (Article 13 (2) RPBA 2020).

2.5 Claim 1 - Novelty

The appellant's submissions contesting the opposition division's conclusion that the subject-matter of claim 1 of the main request was not new in view of document E7 (Articles 52 (1) and 54 (1) EPC) were only based on the two new allegations of fact addressed in points 2.3 and 2.4 above. Since none of these new allegations of fact are admitted into the proceedings, the board sees no reason to review the opposition division's decision in this respect.

Consequently, the main request is not allowable.

3. *First auxiliary request*

3.1 Admission

The claims of the present first auxiliary request differ from the claims of the first auxiliary request filed with the statement of grounds of appeal in that the term "times" already present in claim 1 of the first auxiliary request underlying the decision under appeal has been reinstated in claim 1, in that the term "disphosphorus" of claim 1 has been corrected to read "diphosphorus", and in that dependent claims 2, 3 and 9 of the mentioned request filed with the statement of grounds of appeal have been deleted.

The respondent submitted that the appellant based the patentability of claim 1 of this request on technical effects attributed to the presence of boron in the core of the optical fiber, but that the dependent claims of the main request involving the presence of boron in the core have been deleted (see point 2.1 above, first paragraph), resulting in a lack of convergence that justified not admitting the amended first auxiliary request into the proceedings.

The board notes that the mentioned amendments were made in reply to objections raised by the board under Article 84 and Rule 80 EPC in the communication annexed to the summons to oral proceedings. In addition, as a result of the amendments, claim 1 of the present first auxiliary request is identical to the variant (cf. "the core further contains at lease [sic] one of fluorine and boron") of claim 1 of the auxiliary request underlying the decision under appeal relating to the presence of boron in the core. Furthermore, the board does not see in the respondent's submissions in what respect the deletion of dependent claims of the main request would have an effect on the admissibility of

claim 1 of the first auxiliary request the subject-matter of which was already addressed during the first-instance proceedings and in the decision under appeal.

In view of these considerations, the board considered appropriate to admit the claims of the present first auxiliary request into the proceedings (Articles 13 (1) and (2) RPBA 2020).

3.2 Novelty

- 3.2.1 In its decision the opposition division found that claim 1 of the main request lacked novelty over Examples 1 and 2 disclosed in document E7, and held in particular that the subject-matter of claim 1 of the then auxiliary request was not new in view of the further disclosure of document E7 relating to the presence of boron in the core (claims 1 and 6 of document E7).

With the statement of grounds of appeal the appellant contested this view and submitted that none of the examples 1 and 2 of document E7 disclosed the use of aluminium and boron as claimed, and that document E7 disclosed the equivalent use of "aluminium and/or boron", without however disclosing any embodiment strictly requiring both aluminium and boron.

- 3.2.2 The board notes that the core of the optical fibers of Examples 1 and 2 of document E7 contains aluminium, but not boron. In addition, the description of document E7 discloses the use of "aluminium and/or boron" in the core of the fibers and the technical effect of the presence of aluminum and/or boron in the core (claims 1, 48 and 57, together with page 6, lines 2 to 7, lines 17 to 19, and lines 25 to 34, page 7, lines 3 to 6, and

lines 17 to 22, and page 9, lines 17 to 28), but - contrary to the submissions of the respondent - the equivalence of the presence of aluminium and of boron in the core does not result in the claimed subject-matter as there is no direct and unambiguous disclosure in document E7 of a modification of the specific optical fiber of Example 1 or of Example 2 by the incorporation of boron in the core, or of an embodiment anticipating the specific combination of features of claim 1 of the first auxiliary request.

For this reason, the board is of the opinion that the optical fiber of claim 1 of the first auxiliary request differs from the optical fiber of each of Examples 1 and 2 in that the core contains boron.

3.2.3 Therefore, the subject-matter of claim 1 of the first auxiliary request is new over document E1 (Articles 52 (1) and 54 (1) EPC).

3.3 Inventive step

3.3.1 During the oral proceedings the appellant submitted that the presence of boron in the core of the claimed optical fiber had the synergetic technical effect of suppressing the effect of photodarkening while allowing the control of the relative refractive index difference between the core and the cladding.

The board notes, on the one hand, that, as submitted by the respondent, there is no evidence and, in particular, no support in the description of the patent specification that the presence of boron in the core - in particular, the presence of boron in an indeterminate amount as claimed - would have an effect on the suppression of photodarkening. More

particularly, such an affect is not supported by a comparison of the results of the particular examples and the comparative examples disclosed in the patent specification (see Tables on pages 15 to 17, and in particular Example 25 in Table 5 involving the use of boron).

On the other hand, according to the patent specification (paragraph [0046]) the presence of boron allows for an easy control of the refractive index profile of the core.

Therefore, contrary to the respondent's contention that the claimed subject-matter only solved the problem of finding an alternative, the objective technical problem solved by the claimed subject-matter can be formulated as allowing an easier control of the refractive index profile of the core.

- 3.3.2 Document E7 discloses the use of "aluminium and/or boron" as tri-valent network modifiers (page 6, lines 25 to 34), and the document emphasizes that, for the purpose of introducing a tri-valent network modifier, "aluminium and/or boron" can be used, i.e. either aluminium (see examples 1 and 2) or, alternatively, boron (see for instance page 4, lines 26 to 30) or - as directly derivable from claims 3 and 59, and also from page 9, lines 33 to 36 - a combination of aluminium and boron. In addition, according to document E7 the refractive index of the core is controlled according to the relative amounts of the different components of the core, and in particular of the tri-valent network modifiers, i.e. aluminium and/or boron, having a refractive index modifying effect (see page 6, lines 2 to 7, and lines 17 to 19, and page 7, lines 3 to 6).

Therefore, in view of examples 1 and 2 of document E7 - in which aluminium, and no boron, is used - and the teaching of the document relating to the equivalent use of aluminium or boron or of a combination of aluminium and boron for the purpose of controlling the refractive index of the core, the skilled person confronted with the objective problem formulated in point 3.3.1 above would consider the incorporation of boron in the core of Examples 1 and 2 as a possibility of controlling or adjusting the refractive index of the respective core. When following this approach, the skilled person would incorporate boron in the core in a predetermined amount and would, if necessary, adjust the amount of aluminium already present in the core in order to obtain the appropriate refractive index of the core, while maintaining the essential conditions required in document E7 for the total concentration of the network modifier elements (see claim 1 of document E7 according to which "the total atomic concentration of rare earth and the tri-valent network modifiers, such as aluminium and/or boron, is substantially equal to the atomic concentration of the penta-valent network modifier, such as phosphorous", and the algebraic equations imposed in Examples 1 and 2 on the relative proportions of the different components of the core).

As noted by the appellant, the mentioned condition for the total concentration of the network modifier elements are expressed in the case of Examples 1 and 2 in terms of two equations having two unknowns (see, respectively, page 14, lines 25 to 32, and page 15, lines 8 to 15), the two unknowns being the values of the concentration of aluminium and phosphorous, and when boron is incorporated into the core, the two equations would contain three unknowns, two of them being the respective value of the concentration of aluminium and

boron. According to the appellant, the skilled person would not be able to obtain from the two equations containing three unknown specific values for the concentration of aluminium and boron. The board, however, is not persuaded by this argument because the skilled person would, by virtue of the two equations with three unknowns, have more freedom in the selection of the appropriate amounts of aluminium and boron required for achieving a predetermined control or adjustment of the refractive index of the core of Examples 1 and 2 of document E7, while complying with the conditions imposed by the two equations.

It follows from the above considerations that the skilled person would consider controlling or adjusting the refractive index of the core of Examples 1 and 2 by adding an appropriate amount of boron, while readjusting, if needed, the amount of aluminium (2,5 and 3,7 mol%, respectively) already present in the optical fiber of Examples 1 and 2, and, depending on the extent to which the value of the refractive index of the core is to be controlled or adjusted, the skilled person would arrive at an optical fiber as claimed, i.e. at an optical fiber having a core comprising an aluminium oxide equivalent concentration of the aluminium in the broad claimed range ("0.2 mol% or more") and boron in an unspecified concentration.

3.3.3 In view of the above considerations, the board is of the opinion that the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step in view of the disclosure of document E7 (Article 56 EPC).

3.4 For these reasons, the first auxiliary request is not allowable.

4. *Second to sixth auxiliary requests - Admission*

- 4.1 The claims of the present second to sixth auxiliary requests were filed with the letter dated 30 April 2021 in reaction to objections raised by the board under Article 84 and Rule 80 EPC in the communication annexed to the summons to oral proceedings, the objections being similar to those raised in respect of the main and the first auxiliary request and mentioned in points 2.1 and 3.1 above. In addition, claim 1 of each of the present second to sixth auxiliary requests differs from claim 1 of the respective second to sixth auxiliary request filed with the statement of grounds of appeal in amendments analogous to those indicated in points 2.1 and 3.1 above in respect of claim 1 of the main and the first auxiliary request, so that the subject-matter of claim 1 of the second to sixth auxiliary requests was, in substance, not affected by the amendments.

The respondent, in reply to the statement of grounds of appeal, already requested that the second to sixth auxiliary requests submitted with the statement of grounds of appeal not be admitted into the proceedings under Article 12 (4) RPBA 2007 because the appellant had not addressed the possible relevance of the claims of these auxiliary requests in respect of the decision under appeal, and in particular in respect of novelty and inventive step, and had not substantiated why these requests should be admitted into the proceedings. During the oral proceedings the respondent maintained these submissions in respect of the corresponding second to sixth auxiliary requests submitted with the letter dated 30 April 2021.

- 4.2 The board notes that claim 1 of each of the present second to sixth auxiliary requests has no counterpart in the claims considered during the first-instance proceedings. Furthermore, the mentioned claims could have been presented during the first-instance proceedings. In addition, claim 1 of each of the second to sixth auxiliary requests incorporates features from the description - in particular, the claimed values of the equivalent concentration of B_2O_3 in the core -, and these features were disclosed in the description in connection with technical effects - in particular, as regards the values of the equivalent concentration of B_2O_3 in the core, in connection with the technical effect relating to the suppression of an increase in residual stress, see paragraph [0054] of the description of the patent - that were not addressed during the first-instance proceedings.
- 4.3 According to Article 13 (1) RPBA 2020 (which applies in the present case according to Article 25 RPBA 2020) the claims of the present second to sixth auxiliary request "may be admitted only at the discretion of the Board". Furthermore, according to the mentioned article "Article 12 [RPBA 2020], paragraphs 4 to 6 shall apply *mutatis mutandis*" and, in accordance with Article 25 (2) RPBA 2020, Article 12(4) RPBA 2007 should be applied *mutatis mutandis* in the present case instead of Article 12 RPBA 2020, paragraphs 4 to 6. In addition, according to Article 12 (4) RPBA 2007 it is within "the power of the Board to hold inadmissible [...] requests which could have been presented [...] in the first instance proceedings". It is also noted that according to Article 12 (2) RPBA 2020 "[i]n view of the primary object of the appeal proceedings to review the decision under appeal in a judicial manner, a party's appeal

case shall be directed to the requests [...] on which the decision under appeal was based".

As already noted in point 4.2 above, the claims of the present second to sixth auxiliary requests could - and should - already have been presented during the first-instance proceedings. In addition, the appellant has submitted no reason that would justify the submission of the claims of the present second to sixth auxiliary requests - or, equivalently, of the second to sixth auxiliary requests submitted with the statement of grounds of appeal and having a claim 1 defining, in substance, the same subject-matter as the respective claim 1 of the present second to sixth auxiliary requests - during the appeal proceedings. In these circumstances, the board sees no reason that would justify exercising its discretion under Article 13 (1) RPBA 2020 in favour of the appellant, i.e. in the sense of admitting the present second to sixth auxiliary requests into the proceedings.

- 4.4 For these reasons, the board decided not to admit the present second to sixth auxiliary requests into the appeal proceedings.
5. Since the appellant's requests are either not admitted or considered not allowable by the board, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



L. Gabor

R. Bekkering

Decision electronically authenticated