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Datasheet for the decision of 5 November 2010

Case Number: T 1625/08 - 3.5.03

Application Number: 98123445.3

Publication Number: 0902567

IPC: H04J 14/02

Language of the proceedings: EN

Title of invention:
Optical amplifying apparatus and method for amplifying a light signal

Applicant:
FUJITSU LIMITED

Opponent:
-

Headword:
Optical amplifier/FUJITSU

Relevant legal provisions:
EPC Art. 76(1)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Intermediate generalization - added subject-matter (all requests - yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1625/08 **-** 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 5 November 2010

Appellant: FUJITSU LIMITED
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 2 April 2008 refusing European application No. 98123445.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: B. Noll
R. Menapace

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division refusing European patent application no. 98123445.3. The sole ground for refusal given in the decision was that the subject-matter of the application, which is a divisional of the earlier application no. 97107189.9, extended beyond the content of the earlier application as filed (Article 76(1) EPC).

II. With the statement of grounds the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of an earlier set of claims considered in the examination procedure and filed on 18 January 2006. Oral proceedings were conditionally requested.

III. In a communication accompanying a summons to oral proceedings the board gave a preliminary view on the case.

IV. On 5 October 2010 the appellant filed three sets of claims according to a main and two auxiliary requests in preparation for the oral proceedings. Arguments in support of the claims were provided in the accompanying letter.

V. Claim 1 according to the main request reads as follows:

"An optical amplifying apparatus comprising
a first amplifying stage (1000) for amplifying a light signal, to produce a first stage amplified light signal;

a second amplifying stage (3000) for amplifying said first stage amplified light signal, to produce a second stage amplified light signal;
an optical attenuator (64) optically connected between said first and second amplifying stages, for attenuating the light signal amplified by said first amplifying stage (1000) and being passed through said optical attenuator, the optical attenuation value of said optical attenuator (64) being variable to control a power level of the first stage amplified light signal; and
a dispersion compensation optical fiber (100) optically connected between said first and second amplifying stages, for compensating for dispersion in the first stage amplified light signal when travelling through said dispersion compensation optical fiber (100)."

Claim 1 according to the first auxiliary request differs from claim 1 of the main request in specifying the dispersion compensation optical fiber before the optical attenuator, the language of these features being unchanged, and by including the following additional features:

"an automatic level control circuit (66), a first optical branching coupler (54_3), and a first photodiode (58_3), which are arranged to control the power level of the light signal received by the second amplifying stage (3000) at a constant level;
a first gain controller (60_3), a second optical branching coupler (54_1), a second photodiode (58_1), a third optical branching coupler (54_2), a third photodiode (58_2), a fourth optical branching coupler (56_1) and a first leaser [sic] diode (59_1), which are

arranged to control a gain of said first amplifying stage (1000) to be constant; and
a second gain controller (60_2), a fifth optical branching coupler (54_5), a fourth photodiode (58_6), a sixth optical branching coupler (54_4), a fifth photodiode (58_5), a seventh optical branching coupler (56_2) and a second leaser [sic] diode (59_2), which are arranged to control a gain of said second amplifying stage(3000) to be constant."

Claim 1 according to the second auxiliary request adds to claim 1 of the first auxiliary request the further feature "wherein the sixth optical branching coupler (54_4) sends the second stage amplified light signal to the fifth photodiode (58_5) and the fifth photodiode (58_5) is electrically connected to the automatic level control circuit (66) and the second gain controller (60_2)".

VI. In the statement of grounds and in the course of the oral proceedings the appellant argued that the embodiments shown in Figures 13 to 17 were to be considered only as examples. This was also clear from the last paragraph of the originally filed description. It was generally known to the skilled person that a dispersion compensation optical fiber, being a purely passive linear component, could be placed at any position along the optical transmission path. Therefore, the order of arrangement of the attenuator and the dispersion compensation optical fiber between the first and second amplifying stages was arbitrary and could be freely chosen. Furthermore, the appellant referred to claims 45, 46 and 51 of the parent application as filed according to which an attenuator and a dispersion fiber

could be combined with an optical amplifier either selectively or in combination; with a combination it was left open whether the attenuator was to be arranged before or after the dispersion compensation fiber. The appellant further referred to two prior art documents filed together with the statement of grounds, to demonstrate that it was known at the priority date of the application that an attenuator and a dispersion compensation fiber may be arranged equally before or behind one other.

VII. Oral proceedings before the board were held on 5 November 2010. At the end of the oral proceedings the board's decision was announced.

Reasons for the Decision

1. The only question at issue is whether claim 1 of each request, by merely stating that the dispersion compensation optical fiber is arranged between the first and second amplifying stages without specifying the order, constitutes subject-matter which extends beyond the content of the earlier (parent) application as filed and, thus, does not comply with the provision of Article 76(1) EPC.

2. The invention relates to an optical amplifier for wavelength-division multiplexed (WDM) optical signals transmitted through an optical fiber. Such amplifiers typically include a rare-earth doped optical fiber serving as an amplifying medium (column 1 line 54 to column 2 line 5 of the published parent application). Figure 2 of the parent application shows an arrangement

said to be prior art (column 4, line 13), in which a rare-earth doped fiber amplifier is operated to maintain the ratio between the output and the input level of the WDM signal constant (column 6 lines 47-56). The power level of the output WDM signal is kept constant by means of a controllable attenuator (column 7 lines 5-10). The parent application specifically addresses various problems occurring with the optical amplifier when the number of wavelength channels in the WDM signal changes (column 7 lines 11-42).

3. The invention as claimed in the present application relates to an arrangement as shown in Figure 13 of the parent application. This arrangement consists of two optical amplifier stages 1000, 3000, set up to operate at a constant gain, an optical attenuator stage 2000 having a controllable attenuation being located between the amplifier stages and a dispersion compensation fiber 100 after the attenuator stage. With regard to the position of the dispersion compensation fiber in the signal path it is said at column 17 lines 50-55 of the published parent application that "Dispersion compensation fiber 100 is connected between second part 2000 and third part 3000" which is in agreement with what is shown in Figure 13. Figures 14-17 show further arrangements having the dispersion compensation fiber at the same location as Figure 13. No other statements can be found in the parent application as regards the position of the dispersion compensation fiber in the signal path. Claim 51 of the parent application, which adds the feature of a dispersion compensation fiber to the amplifier apparatus of claim 45, likewise fails to

suggest any alternative position of the dispersion compensation fiber in the optical transmission path.

4. Although the board does not challenge the appellant's view that the skilled person would consider that a dispersion compensation fiber could, in principle, be located at any position in an optical transmission path, the question to be answered is whether the skilled person would directly and unambiguously derive from the parent application that a sequence of the dispersion compensation fiber and the attenuator other than that shown in e.g. Figure 13 was envisaged. The board takes the view that this is not the case. This is because the photo detectors and control circuits necessary to monitor the optical signal at various stages for controlling the attenuator are arranged in a specific configuration and adapted to the sequence of the attenuator and the dispersion compensation fiber, which would discourage the skilled person from changing the order. Although as correctly pointed out by the appellant in the oral proceedings before the board, the skilled person might nevertheless consider configurations in which the dispersion compensation fiber is located at other positions in the optical transmission path than shown in Figure 13, this is tantamount to saying that the skilled person would find it obvious to change the position of the fiber, implying that this is not directly and unambiguously derivable from the application documents of the parent application as filed. For this reason the board concludes that any claim which embraces a location of the dispersion compensation fiber in the optical transmission part other than between stages 2000 and

3000 adds subject-matter which goes beyond the content of the parent application as filed.

5. The appellant also argued that the person skilled in the art would have understood from the last paragraph of the description of the parent application that changes could be made to embodiments "without departing from the principles and spirit of the invention"; the teaching of the application as originally filed was therefore not limited to the embodiments exactly as shown in Figures 13 - 17, the order of arrangement of the attenuator and the dispersion compensation optical fiber between the first and second amplifying stages being freely choosable. This argument cannot be followed: The board observes that this wording, being devoid of technical teaching, can have no influence on the interpretation of the description or the claims. Reference is directed to the Guidelines for Examination (April 2010), C-III, 4.4.

6. Since claim 1 of each request merely specifies the dispersion compensation fiber as being optically connected between the first and second amplifying stages without specifying the order with respect to the attenuator, the application in accordance with each request fails to meet the requirement of Article 76(1) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Rauh A. S. Clelland