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Datasheet for the decision of 24 September 2012

Case Number: T 0478/12 - 3.4.02

Application Number: 06800384.7

Publication Number: 1920279

IPC: G02B6/28

Language of the proceedings: EN

Title of invention:
SYSTEMS AND METHODS FOR DISTRIBUTING SIGNALS COMMUNICATED ON FIBER OPTIC TRANSMISSION LINES

Applicant:
THE BOEING COMPANY

Relevant legal provisions:
EPC Art. 56

Keyword:
Novelty and inventive step (yes)

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Case Number: T 0478/12 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 24 September 2012

Appellant: (Applicant)	THE BOEING COMPANY 100 North Riverside Plaza Chicago, IL 60606-2016 (ETATS-UNIS D'AMERIQUE)
Representative:	McLeish, Nicholas Alistair Maxwell Boult Wade Tennant Verulam Gardens 70 Gray's Inn Road London WC1X 8BT (ROYAUME UNI)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 27 September 2011 refusing European patent application No. 06800384.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
D. Rogers

Summary of Facts and Submissions

I. The applicant appealed against the decision of the examining division refusing European patent application n° 06800384.7 (published with the International publication Nr. WO-A-2007/021484) concerning a fiber optic splitter assembly.

The decision issued by the examining division is a decision according to the state of the file which refers to earlier communications dated 22 February 2011 and 29 August 2011 in which the following documents are cited as prior art:

D1: US 3 883 223 A
D2: FR 2 580 411 A1
D3: EP 0 162 627 A2
D4: EP 1 186 943 A2
D5: JP 56 147 106 A
D6: EP 0 097 886 A1.

II. The appellant requests that the decision of the examining division be set aside and that a patent be granted on the basis of a set of claims submitted under cover of a latter dated 10 September 2012. Claims 1, 4, 8 and 13, the only independent claims, read as follows:

"1. A fiber optic splitter assembly (40), comprising:
an optical reflector (18); and
a fiber optic bundle (41) including a transmitting optic fiber (14) and a plurality of receiving optic fibers (16) proximate to the transmitting optic fiber (14), wherein respective terminal ends of the transmitting optic fiber (14) and the plurality of receiving optic fibers (16) are approximately aligned and operatively positioned relative to the optical

reflector (18) such that a transmitted optical signal from the transmitting optic fiber (14) is reflected from the optical reflector (18) to the plurality of receiving optic fibers (16), characterized by a first portion of the plurality of receiving optic fibers configured to provide a degree of optical signal attenuation at each of their respective terminal ends and a second portion of the plurality of receiving optic fibers remaining non-attenuated at their respective terminal ends."

"4. A fiber optic communications system (10), comprising:
a transmitter (22) operable to transmit an optical signal;
at least one receiver (24) operable to receive an optical signal; and
a fiber optic splitter assembly according to claim 1, wherein the transmitting optic fiber is coupled to the transmitter and the plurality of receiving optic fibers are coupled to the receiver."

"8. A method of distributing optical signals communicated on fiber optic transmission lines, comprising:
positioning a fiber optic bundle (41) adjacent to a concave optical reflector (18), the fiber optic bundle (41) comprising a first optic fiber (14) and a plurality of second optic fibers (16), wherein a first portion of the plurality of receiving optic fibres are configured to provide a degree of optical signal attenuation at each of their respective terminal ends and a second portion of the plurality of receiving optic fibers remain non-attenuated at their respective terminal ends;

transmitting an optical signal to the first optic fiber (14) in the fiber optic bundle (41);
projecting the optical signal onto the concave optical reflector (18); and
reflecting the optical signal from the concave optical reflector (18) towards the plurality of second optic fibers (16)."

"13. An aerospace vehicle (300), comprising:
a fuselage;
wing assemblies and an empennage operatively coupled to the fuselage; and
a fiber optic communications system (10) positioned in at least one of the fuselage, the wing assemblies and the empennage, wherein the fiber optic communication system (10) is in accordance with claim 4."

III. No oral proceedings were held before the Board in this case.

Reasons for the Decision

1. The appeal is admissible.

2. The claimed subject-matter

Independent claim 1 is directed to a fiber optic splitter assembly which *inter alia* comprises a plurality of receiving optic fibers of which a first portion is "configured to provide a degree of optical signal attenuation at each of their respective terminal ends" as is disclosed expressly in the description of the application as published under the PCT, in

connection with the embodiment of figure 3 (see page 6, lines 13 and 14) and illustrated by two examples, the first constituted by selective treatment of the terminal ends of the fibers and the second by the removable coupling of attenuators at such ends (see page 6, lines 19 - 23).

A second portion of the plurality of receiving optic fibers remain non-attenuated at their respective terminal ends.

By virtue of the claimed arrangement, the optical signal from the transmitting optic fiber as reflected by the optical reflector can be subjected to selective attenuation when coupled into the receiving optic fibers, depending on their respective configuration.

3. Patentability

3.1 The board agrees with the appellant's view that the closest prior art is disclosed in document D2, which is the sole document in the file to disclose attenuation means in a fiber optic splitter assembly with a reflector 6 to reflect an optical signal from a transmitting optic fiber F1 into a plurality of receiving optic fibers F2 (see the embodiments of figures 10, 11 and 12). In particular, the latter embodiments further comprise controllable attenuation means located directly in front of the reflector and constituted by either a slidable photometric edge 10 in figure 10, a slidable plate with a diaphragm opening having a steadily increasing width 11 in figure 11 or a rotative iris diaphragm 13 in figure 12.

3.2 In the arrangements of document D2, the photometric edge 10 and diaphragm 11 or 13 are disposed between the

optical reflector and the terminal ends of the optic fibers such as to achieve a variable attenuation simultaneously upon all the outputs of the splitter assembly, as is set out expressly in claims 7 ("un coin photométrique (10) rectiligne ou circulaire provoquant une atténuation variable simultanément sur toutes les voies de sortie du coupleur") or 10 ("le diaphragme [...] permettant une atténuation simultanée quelconque désirée du faisceau dirigé sur les secondes fibres").

The splitter assembly of present claim 1 is distinguished therefrom in that, for a first portion of the receiving optic fibers, signal attenuation is achieved at their terminal ends by an appropriate configuration of the optic fibers themselves, the fibers of a second portion remaining non-attenuated. This technical feature permits the desired attenuation to be achieved only at selected outputs of the splitter assembly.

3.3 Neither documents D2 nor any of the other citations on the file disclose a splitter assembly exhibiting such capability, nor even suggest that selective attenuation only at certain outputs might be desirable.

In particular, the splitter assemblies of documents D1 and D3, though of the same general type as that of the invention, do not comprise any attenuation means whatsoever.

Documents D5 and D6 do not relate to splitter assemblies, but merely disclose attenuating plates comprising sections providing different attenuation and mounted rotatably in the gap between the ends of two aligned optical fibers.

Document D4 is the only document to disclose a bundle of optic fibers 23 having adjacent terminal ends each provided with respective attenuation filters 22 (see figure 4 and 5 and the abstract). This structure is used however in an apparatus for exposing sensitometric and barcode data on two photosensitive media, which has hardly anything to do with the fiber optic splitter assembly of the invention.

For the sake of completeness, the Board notes that the examining division in its communication of 29 August 2011 referred to in its decision argued that the claimed subject-matter lacked novelty over the arrangement of figure 9 of document D2. This figure however discloses the provision of a deflecting prism 9 located in front of the optical reflector 6 and movable so as to gradually commute the reflected light beam from a first group of receiving optic fibers to a second such group (see claim 8 "un élément déviateur de lumière, tel qu'un prisme (9), de petit angle, [...] permettant de commuter progressivement le faisceau lumineux d'un premier groupe de secondes fibres de départ à un autre groupe de secondes fibres").

Such prism does not provide attenuation within the meaning of claim 1 and, for this reason already, the embodiment referred to by the examining division is less relevant than those of figures 10 to 12 considered to represent the closest prior art.

3.4 For the above reasons, the subject-matter of claim 1 cannot be derived in an obvious manner from the prior art citations on the file and it accordingly involves an inventive step within the meaning of Article 56 EPC.

The same conclusion applies to the subject-matter of independent claim 8, which includes the same limitations in terms of a method of distributing optical signals, and to the subject-matter of the remaining claims which include the limitations of either independent claim 1 or independent claim 8.

4. The description has been adapted to the claims as amended and supplemented with a summary of the relevant content of the closest prior art.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent in the following version:

Description: Pages 1, 4, 5 and 9 of the application as published as WO2007/021484 A1, and pages 2, 2a, 3 and 6 to 8 as filed with the letter of 10 September 2012,
Claims: 1 to 13 as filed with the letter of 10 September 2012, and
Drawings: Sheets 1/4 to 4/4 of the application as published as WO2007/021484 A1.

The Registrar: The Chairman:

C. Rodríguez Rodríguez A. G. Klein

Decision electronically authenticated