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**Datasheet for the decision
of 18 June 2019**

Case Number: T 2056/15 - 3.4.02

Application Number: 04778000.2

Publication Number: 1697768

IPC: G02B6/44

Language of the proceedings: EN

Title of invention:

OPTICAL TUBE ASSEMBLY HAVING A DRY INSERT AND METHODS OF
MAKING THE SAME

Applicant:

Corning Optical Communications LLC

Headword:

Relevant legal provisions:

EPC Art. 123(2)
EPC 1973 Art. 84

Keyword:

Amendments - intermediate generalisation - added subject-
matter - main and auxiliary request (yes)
Claims - clarity - main and auxiliary request (no)

Decisions cited:

Catchword:



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Case Number: T 2056/15 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 18 June 2019

Appellant: Corning Optical Communications LLC
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Representative: Epping - Hermann - Fischer
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 5 June 2015
refusing European patent application No.
04778000.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: H. von Gronau
G. Decker

Summary of Facts and Submissions

- I. The appeal of the applicant is directed against the decision of the examining division to refuse the European patent application No. 04 778 000.2.

The examining division refused the present application because claim 1 of the main request as filed during the oral proceedings before the examining division was considered not to be clear (Article 84 EPC) and its subject-matter not to be new (Article 54(1) and (2) EPC), and the subject-matter of claim 1 according to the auxiliary request as filed during the oral proceedings before the examining division was considered not to involve an inventive step (Article 56 EPC) and not to be sufficiently disclosed (Article 83 EPC).

- II. In the statement setting out the grounds of appeal the appellant maintained the claims on file and explained that the claims according to the auxiliary request comprised in addition to the claim 1 filed during the oral proceedings on 17 April 2015 the dependent claims 2 to 20 of the main request of 17 April 2015. The appellant requested that the contested decision be set aside and that a patent be granted with claims according to the main request or according to the auxiliary request all submitted on 17 April 2015.

As an auxiliary measure oral proceedings were requested.

- III. In a communication annexed to summons to oral proceedings the board expressed its provisional opinion that *inter alia* the subject-matter of claim 1 of the main request and of the auxiliary request comprised an

impermissible intermediate generalisation contrary to Article 123(2) EPC and that claim 1 of both requests was not clear contrary to Article 84 EPC 1973.

IV. With a letter dated 14 May 2019 the representative of the appellant informed the board that it did not intend to participate in the oral proceedings scheduled for 18 June 2019. It did not put forward any further arguments on the merits of the case.

V. Oral proceedings took place on 18 June 2019. As announced with the letter dated 14 May 2019 neither the appellant nor its representative were present at the oral proceedings. At the end of the oral proceedings the chairman of the board announced the board's decision.

VI. Claim 1 of the main request reads as follows:

"An optical tube assembly (10) comprising:
a tube (18), the tube having an interior surface;
at least one optical waveguide (12), the at least one optical waveguide being disposed in the tube;
one dry insert (14), the one dry insert being formed from elongate materials comprising a first layer and a second layer, the first layer being a polyurethane foam tape (14a) and the second layer being a water-swellaable tape (14b), wherein the one dry insert is disposed within the tube adjacent to the interior surface of the tube and disposed about the at least one optical waveguide, and
a coupling between the tube and the at least one waveguide formed by at least a 10 percent compression of the one dry insert, the coupling having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m."

Claim 1 of the auxiliary request reads as follows:

"An optical tube assembly (10) comprising:
a tube (18), the tube having an interior surface;
one optical fiber ribbon stack (13), the one optical fiber ribbon stack being disposed in the tube;
one dry insert (14), the one dry insert being formed from elongate materials having an uncompressed height of about 1.5 mm to about 3.0 mm and comprising a first layer and a second layer, the first layer being a polyurethane foam tape (14a) and the second layer being a water-swellable tape (14b), wherein the one dry insert is disposed within the tube adjacent to the interior surface of the tube and disposed about the one optical fiber ribbon stack, and
a coupling between the tube (18) and the one optical fiber ribbon stack (13) formed by a compression of the one dry insert of about 30 percent the coupling having a normalized pull-out force between about 0.5 N/m and about 2.7 N/m, wherein
the compression of the one dry insert is a localized maximum compression at the corners of the one optical fiber ribbon stack across the diameter."

Reasons for the Decision

1. As announced in its response to the summons of the Board dated 14 May 2019, the appellant or its representative did not attend the oral proceedings. In accordance with Rule 115(2) EPC and Article 15(3) RPBA, the oral proceedings were held without the appellant. By its decision not to attend the oral

proceedings, the appellant has chosen not to make any further submissions during such proceedings. In the present case, the duly summoned appellant has to be treated as relying only on its written case.

2. Main request - claim 1 - amendments (Article 123(2) EPC)

2.1 Claim 1 of the main request defines

"a coupling between the tube and the at least one waveguide formed by at least a 10 percent compression of the one dry insert, the coupling having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m",

wherein the one dry insert is formed from elongate materials comprising a first layer and a second layer, the first layer being a polyurethane foam tape and the second layer being a water-swellable tape.

2.2 This combination of features is not disclosed in the original application documents:

Claims 10, 12 and 16 disclose a normalized "ribbon" pull-out force, without mentioning the 10% compression of the one dry insert.

Claim 29 discloses a normalized pull-out force with the claimed values, but does not disclose the 10% compression.

Claim 23 discloses the compression of a polyurethane foam tape by about 10%, but does not disclose the compression of the whole dry insert including the water-swellable layer.

Claims 31, 32 and 37 disclose the pull-out force only in combination with the waveguide being a ribbon stack waveguide.

Claim 42 discloses that the optical waveguide has a normalized pull-out force between about 0.5 N/m and about 5.0 N/m but does not disclose the claimed compression of the dry insert.

Claim 48 discloses the normalized pull-out force between about 0.5 N/m and about 5.0 N/m but 10% compression is disclosed for the polyurethane foam layer only and does not comprise the water-swellaible layer.

Claim 55 discloses a normalized ribbon coupling force between about 0.5 N/m and about 5 N/m but it is not related to a general optical waveguide.

In the description in relation to figure 3 examples are described where compression of the dry insert and ribbon pull-out force are combined: "Thus, according to the concepts of the present invention the compression of dry insert 14 is preferably in the range of about 10% to about 90%; [...] Preferably, the ribbon pullout force is in the range of about 0.5 N/m and about 5.0 N/m" (page 13, line 30 to page 14, line 1). However, this pull-out force is disclosed with respect to a specific type of optical waveguide (ribbon stack). The claimed pull-out force is not disclosed for any type of optical waveguide.

2.3 The board therefore concludes that the subject-matter of amended claim 1 comprises an impermissible intermediate generalisation contrary to Article 123(2) EPC.

3. Main request - claim 1 - clarity (Article 84 EPC 1973)

3.1 The examining division was of the opinion that claim 1 of the main request was not clear because it defined

the subject-matter by the result to be achieved (cf. point 11 of the decision).

3.2 The appellant was of the opinion that claim 1 was clear because the pull-out force was a characteristic of an optical tube assembly and it would be very easy for a competitor to make a measurement of the pull-out force and determine whether a cable fell under the claimed limitation (cf. grounds of appeal, page 2, penultimate paragraph to page 3, 4th paragraph).

3.3 The board shares the view of the examining division. Claim 1 attempts to define the subject-matter in terms of the result to be achieved (the coupling having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m) and not by the technical features that allow to achieve the result. According to established case law of the boards of appeal features defining a technical result are permissible only if, from an objective viewpoint, such features could not otherwise be defined more precisely without restricting the scope of the invention, and if these features provide instructions which were sufficiently clear for the expert to reduce them to practice without undue burden (see Case Law of the Boards of Appeal, 8th edition 2016, II.A.3.4). In the present case the board is of the opinion that the claimed subject-matter can be defined more clearly by technical features of the optical tube assembly that result in the claimed coupling. The claim does not define all features that influence the pull-out force, in particular the type of waveguide (single optical waveguide or ribbon stack waveguide), the order of the materials of the dry insert (polyurethane foam in contact with the optical waveguide or the tube), the density and resilience of the polyurethane foam and the water-swellable tape and

the surface characteristics of the materials. Thus, for a person skilled in the art it is not possible without undue burden to select suitable dry insert materials to arrive at the claimed subject-matter.

Furthermore claim 1 is not clear because it is a product claim defining a coupling between the tube and the at least one waveguide formed by at least a 10% compression of the one dry insert. However, the compression of the dry insert is rather a feature of the manufacturing process which does not lead to any clearly defined feature of the optical tube. From the optical tube assembly, i.e. the final product, it cannot be seen how much the dry insert has been compressed during the manufacturing process without further detailed information about the dry insert materials and their characteristics.

3.4 The board concludes therefore that claim 1 does not meet the clarity requirement of Article 84 EPC 1973.

4. Auxiliary request - claim 1 - amendments (Article 123 (2) EPC

4.1 The subject-matter of claim 1 of the auxiliary request comprises one "*optical fiber ribbon stack*" and the claim defines that the one dry insert is formed of elongate materials having "*an uncompressed height of about 1.5 mm to about 3.0 mm*" and that "*a coupling between the tube (18) and the one optical fiber ribbon stack (13) [is] formed by a compression of the one dry insert of about 30 percent the coupling having a normalized pull-out force between about 0.5 N/m and about 2.7 N/m*".

4.2 The feature that the normalized pull-out force is about 0.5 N/m or about 2.7 N/m is disclosed on page 13, lines 8 to 20 and in figure 3 of the originally filed application, but there a range in relation to the thickness of the uncompressed dry insert is not disclosed. The originally filed application only discloses an example in which a dry insert of 1.5 mm is compressed by 30% and a ribbon pull-out force of about 2.7 N/m is depicted (cf. bar 36 in figure 3) and an example in which a dry insert of 3.0 mm is compressed by about 30% and a ribbon pull-out force of about 0.5 N/m is depicted (cf. bar 38 in figure 3). Thickness values of the uncompressed dry insert over the whole range between 1.5 mm and 3 mm (which is subsequently compressed by about 30%) are not disclosed.

4.3 The board therefore concludes that the subject-matter of amended claim 1 of the auxiliary request comprises an impermissible intermediate generalisation contrary to Article 123(2) EPC.

5. Auxiliary request - claim 1 - clarity (Article 84 EPC 1973)

5.1 Claim 1 of the auxiliary request is not clear because of similar reasons as for claim 1 of the main request. Claim 1 attempts to define the subject-matter in terms of the result to be achieved (the coupling having a normalized pull-out force between about 0.5 N/m and about 2.7 N/m) and not by the technical features that allow to achieve the result. The claim specifies a compression of the one dry insert of about 30%, but it does not define e.g. the order of the materials of the dry insert, the density and resilience of the polyurethane foam and the water-swellaable tape and the surface characteristics of these materials. It is not

sufficient to define the dry insert's compression of about 30% in order to achieve the claimed normalized pull-out force of the finished optical tube assembly.

5.2 The board concludes therefore that claim 1 does not meet the clarity requirement of Article 84 EPC 1973.

6. Since none of the present requests satisfies the requirements of the EPC, the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



M. Kiehl

R. Bekkering

Decision electronically authenticated