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D E C I S I O N
of 20 August 2004

Case Number: T 0649/03 - 3.2.7

Application Number: 94910794.0

Publication Number: 0738239

IPC: C03B 23/055

Language of the proceedings: EN

Title of invention:

Optical preform with controlled and deeply placed radial bonded interface layer

Applicant:

Ward, Robert, M., et al

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 54, 111(1)

Keyword:

"Novelty - yes"
"Remittal - yes"

Decisions cited:

-

Catchword:

-



Case Number: T 0649/03 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 20 August 2004

Appellant: Ward, Robert, M.
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 21 January 2003
refusing European application No. 94910794.0
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. Burkhart
Members: P. A. O'Reilly
E. Lachacinski

Summary of Facts and Submissions

I. The appellant (applicant) filed an appeal against the decision of the Examining Division to refuse the European application No. 94 910 794.

II. The application was refused by the Examining Division for lack of novelty.

The most relevant prior art documents for the present decision are:

D2: Patent abstract of JP-A-63 147837

D3: US-A-4 749 396

D4: GB-A-2 043 619

D5: FR-A-2 619 561

D6: GB-A-2 032 910

III. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 14 filed with letter of 29 November 1999. If the main request cannot be granted then remittal to the first instance with a finding as to novelty is requested.

IV. The independent claim of the main and sole request reads as follows:

"1. An optical glass preform (10), suitable for use in the production of lens and fibres, comprising:

(a) a core (12) of a first glass material, said core having a central axis;

(b) a tube (14) of a second glass material provided surrounding said core along a length of said central axis;

(c) an interface layer (16) formed between and bonding together with the opposing surfaces of said core and said tube by a radially driven interdiffusion of said first and second materials, giving a radial mid-point of said interface layer (16) deep beneath said tube's outer surface, said interface layer (16) thereby being a deeply placed bonded interface layer."

V. The Examining Division essentially refused the application for the following reasons:

The glass body disclosed in document D2 is not called a preform. The expression preform however does not have any constructive implication. The glass body that is manufactured by the process disclosed in document D2 has a continuously varying dopant and refractive index so that there is interdiffusion. The glass body is suitable for forming lenses. This glass body therefore falls within the scope of claims 1, 8 and 9.

VI. The appellant argued essentially as follows:

The glass body of document D2 when in the pre-drawn form only contains a step-wise refractive index gradient. A continuous gradient is only achieved when the preform has been drawn into the final fibre. This final optical fibre is not suitable as a source of lenses. There is no disclosure of a preform with

continuous refractive index gradient and hence interdiffusion between material layers.

Reasons for the Decision

1. *Novelty*

1.1 Claim 1 is directed to a glass preform for producing lenses or fibres. From several of the prior art documents, e.g. document D3 (column 1, lines 31 to 32), document D4 (page 1, lines 102 to 106) or document D5 (page 9, lines 28 to 36), it is indicated that a preform is around 10-25 mm (10,000-25,000 microns) in diameter. This is similar to the size indicated in the application in suit, cf. page 19, line 15 which mentions 25.25 mm. An optical fibre on the other hand is between 1 and approx. 500 microns, e.g. see document D4 (page 2, lines 34 to 36), document D5 (page 10, lines 19 to 21) or document D6 (page 3, lines 75 to 79). An optical fibre is thus at least 20 times smaller in diameter than its preform. For optical fibres a skilled person can therefore distinguish a preform from the fibre. The same may be reasonably presumed for lenses.

1.2 Document D2 describes the manufacture of a preform and its subsequent transformation. Glass tubes 1 with varying dopant concentrations are used to produce a "solid tube" 2. This glass body has a stepwise concentration of dopant. The glass body is "further heated" and "stretched". This heating and stretching is the step which produces the fibres. This further heating is also stated as producing the "diffusion of the dopant" as well as variation in the refractive

index. It must be considered whether the preform (glass body) of document D2 has interdiffusion of the two materials as specified claim 1. In document D2 it is stated that "The glass body 2 which varies stepwise in the dopant concn. and varies stepwise in the refractive index is thereby obt'd." This implies that there is no interdiffusion of the glass tubes 1 when they are formed into the glass body. It is indicated that after further heating and stretching "The glass body for optical transmission" has a continuously varying dopant concentration and refractive index. The continuous variation implies interdiffusion. However, this is at a stage when the body is no longer a preform, but has arrived at its final form as used for optical transmission, i.e. an optical fibre. This is shown by the fact that it is referred to as a body for optical transmission. It could be considered that interdiffusion occurs inevitably during the formation of the glass body during the first heating process. However, the fact that at this stage the dopant concentration and refractive index are referred to as "stepwise" indicates that any interdiffusion is so small that it has no effect and cannot reasonably come within the scope of the term "interdiffusion" as used in claim 1.

The Examining Division considered that the glass body which is formed after the further heating and stretching steps could be considered a preform, in particular for a lens. Whilst this glass body is suitable for optical transmission (it appears to form an optical fibre) there is nothing to indicate that it could itself be considered as a preform for forming a lens when considering the normal meaning of the term

lens. The term preform has a known meaning in the art as has been explained above. There is nothing to indicate that the body manufactured from the process disclosed in document D2 could fall within the scope of this term.

1.3 Therefore, the subject-matter of claim 1 is novel with respect to document D2 in the sense of Article 54 EPC.

1.4 Claims 8 and 9 are dependent on claim 1 and therefore their subject-matter is also novel in the sense of Article 54 EPC with respect to document D2.

2. *Inventive step*

Since the Examining Division have not yet considered inventive step it is not appropriate for the Board to express an opinion on this matter.

3. *Remittal to the First Instance*

The Examining Division has not yet examined claim 1 with regard to inventive step so that a patent cannot be granted in accordance with the main request. In accordance with Article 111(1) EPC, the Board therefore considers it appropriate to remit the case to the first instance to continue the examination in accordance with the first auxiliary request.

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 for further prosecution.

The Registrar:

The Chairman:

G. Nachtigall

A. Burkhart