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Datasheet for the decision of 5 July 2018

Case Number: T 2156/13 - 3.4.02

Application Number: 06839255.4

Publication Number: 1958018

IPC: G02C7/04

Language of the proceedings: EN

Title of invention:
CONTACT LENS WITH HIGH-ORDER COMPENSATION FOR NON-AXISYMMETRIC STRUCTURE

Applicant:
Bausch & Lomb Incorporated

Headword:

Relevant legal provisions:
EPC 1973 Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:

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Case Number: T 2156/13 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 5 July 2018

Appellant: (Applicant)	Bausch & Lomb Incorporated 1400 North Goodman Street, Area 62 Rochester, NY 14609 (US)
Representative:	Glas, Holger Maiwald Patentanwalts- und Rechtsanwaltsgesellschaft mbH Elisenhof Elisenstraße 3 80335 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 22 April 2013 refusing European patent application No. 06839255.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Bekkering
Members:	A. Hornung
	G. Decker

Summary of Facts and Submissions

I. The applicant lodged an appeal against the decision of the examining division refusing European patent application No. 06839255.4 on the basis of Article 54(1) and (2) EPC (main request and second auxiliary request then on file) and on the basis of Article 56 EPC (first and third auxiliary requests then on file). A fourth auxiliary request, filed during the oral proceedings, was not admitted into the proceedings under Rule 137(5) EPC.

II. With the statement setting out the grounds of appeal, the applicant filed sets of claims according to a main request and to first to third auxiliary requests, identical, respectively, to the sets of claims according to the main request and the first to third auxiliary requests underlying the appealed decision.

III. In response to the summons to oral proceedings, the appellant filed, with letter of 30 May 2018, amended claims according to a new main request and to new first to fifth auxiliary requests.

IV. Oral proceedings were held on 5 July 2018.

During oral proceedings, the appellant withdrew all requests but the third auxiliary request then on file, which thereby became the appellant's main and sole request.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 and 2 of the main request.

V. The present decision refers to the following document:

D7: JP 8-262376, in combination with the English machine translation having been annexed to the summons to oral proceedings.

VI. Independent claim 1 reads as follows:

"A method of making a contact lens, comprising the steps of:

forming a contact lens body having anterior and posterior surfaces aligned along an optical axis for producing spherical or cylindrical corrections,

wherein the anterior and posterior surfaces are related by way of a non-axisymmetric thickness variation to incorporate an orienting feature for orienting the contact lens body about the optical axis,

identifying a non-axisymmetric wavefront aberration produced by the non-axisymmetric thickness variation of the orienting feature, wherein the non-axisymmetric wavefront aberration includes a third-order wavefront aberration, and

modifying at least one of the anterior and posterior surfaces to at least partially compensate for the identified non-axisymmetric wavefront aberration produced by the non-axisymmetric thickness variation,

in which the step of identifying includes identifying vertical coma produced by the thickness variation, and the step of modifying includes to at least partially compensate for the vertical coma produced by the thickness variation."

Reasons for the Decision

1. Inventive step

It is undisputed that D7 represents the closest prior art.

The subject-matter of claim 1 differs from the method of D7 in that "the step of identifying includes identifying **vertical coma** produced by the thickness variation, and the step of modifying includes to at least partially compensate for the **vertical coma** produced by the thickness variation" [bold highlighting added].

The technical effect of the distinguishing feature is that higher-order wavefront modifications, in particular vertical coma, can be incorporated into a contact lens to compensate for the non-axisymmetric thickness variation of the orienting feature and to improve thereby the imaging performance of the contact lens, especially under low light conditions. The compensation is independent of an individual eye aberration and thus can provide a better starting point to accommodate the distribution of higher-order aberrations throughout a given population of patients. See patent application, paragraph bridging pages 3 and 4 and second paragraph on page 4. See also appellant's letter of reply of 30 May 2018, page 7, third paragraph.

The objective technical problem consists in how to improve the imaging performance of a mass produced contact lens comprising an orienting feature in form of a non-axisymmetric thickness variation. See appellant's letter of reply of 30 May 2018, page 7, fourth paragraph.

In the field of mass-produced contact lenses, striving for improved imaging performance is notorious and naturally leads the skilled person to contemplate the compensation of optical aberrations introduced by the prism-ballast of the contact lens by optimizing the shape of the contact lens.

Starting from D7, dealing with mass-produced contact lenses, the skilled person receives explicit incentive "to provide a contact lens which is **excellent** in optical performance" (see D7, [0023]; emphasis added). What is meant by an "excellent optical performance" can be deduced from claim 1 of D7 which defines a contact lens having a lens shape for "correcting the aberration caused by the prism". Thus, claim 1 of D7 does not restrict the type of aberrations to be compensated to solely astigmatism but encompasses any higher-order aberrations caused by the prism.

It is well-known in the art that a prism in a contact lens generates not only astigmatism but also other higher-order aberrations, including vertical coma, which degrade the imaging performance.

Furthermore, D7, [0042], teaches "a ray tracing method using a computer" in order to calculate the appropriate lens surface. The optical ray tracing method inherently incorporates information about all optical aberrations generated by the contact lens, including vertical coma.

Hence, confronted with the objective technical problem of improving the imaging performance of a prism-ballasted contact lens, the skilled person will not only be motivated by D7 (see e.g. claim 1 of D7) but also be guided how to identify higher-order aberrations, including vertical coma, i.e. by using a tracing method (see D7, [0042]). By using the information obtained from the ray tracing method, the skilled person will encounter no difficulties in designing a lens shape compensating higher-order aberrations, including vertical coma, produced by the orienting feature, thereby arriving at the claimed method without exercising any inventive skills.

It follows that the subject-matter of claim 1 does not meet the requirements of Article 56 EPC 1973.

2. Counter-arguments from the appellant

2.1 The appellant argued that D7 discloses the correction of astigmatism which is not even a third-order aberration but a second-order aberration.

The board cannot follow this argument since it is generally accepted in the field of optical aberrations that third-order aberrations include spherical aberration, coma, astigmatism, field curvature and distortion, i.e. the so-called Seidel aberrations. Claim 1 does not comprise any further features which would limit the broad meaning of the expression "third-order aberration" in order to exclude astigmatism. Even if the astigmatism disclosed in D7 were to be interpreted as being a second-order aberration, the distinguishing step of claim 1 with respect to D7 and, hence, the reasoning for lack of inventive step, would remain unchanged (see point 1 above).

2.2 The appellant argued that D7 did not explicitly mention vertical coma nor dit it provide a hint to this very specific third-order aberration. Since many optical aberrations existed, it could not be obvious for the skilled person to select precisely vertical coma to be identified and compensated for.

The board agrees with the appellant that many optical aberrations other than vertical coma exist. However, vertical coma is one of the most pre-eminent higher-order aberrations which remain in the wavefront produced by a prism-ballasted contact lens after astigmatism has been compensated for. The skilled person, when modifying the lens shape in order to provide a contact lens having excellent

optical performance, will take all relevant aberrations, including obviously vertical coma, into account, especially in view of the fact that the correction of lens aberrations is based on the use of ray tracing which encompasses all aberrations.

2.3 The appellant further argued that, in the field of ophthalmic lenses such as contact lenses, little attention, if any, was devoted to higher-order aberrations, in particular vertical coma, before the priority date of the present patent application. The appellant referred to page 12, second paragraph, of the patent application stating that "the effect of vertical coma on visual acuity is less apparent" and was overlooked before the filing of the present application. The inventors, however, recognized for the first time the relevance of vertical coma, especially when the contact lens is used under lower light conditions. The appellant further referred to figures 4A and 4B which "impressively illustrate the difference between an image without vertical coma (Fig. 4A) and an image that is deteriorated by the presence of vertical coma (Fig. 4B)" (see letter of 30 May 2018, point 3.3, page 12).

This line of argument is not found convincing by the board. As explained above, starting from D7, the objective technical problem is to improve the imaging performance of the prism-ballasted contact lens of D7 in order to provide a prism-ballasted contact lens having excellent optical performance. In order to solve this problem, the skilled person would necessarily modify the lens shape in order to compensate for the next most relevant optical aberrations which include vertical coma. Moreover, since coma is an optical aberration which increases substantially with the pupil diameter, it is not surprising but evident that the degradation of visual acuity will increase under low light conditions, i.e. when the eye pupil of the wearer of the contact lens is larger than during bright daylight

conditions. The special technical advantage under low light conditions of a contact lens provided by the method of claim 1, as the appellant asserted, is therefore not surprising but foreseeable for the skilled person.

3. Accordingly, the appellant's main and sole request is not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl R. Bekkering

Decision electronically authenticated