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**Datasheet for the decision  
of 17 July 2018**

**Case Number:** T 1916/14 - 3.2.02

**Application Number:** 07757012.5

**Publication Number:** 2026693

**IPC:** A61B3/10

**Language of the proceedings:** EN

**Title of invention:**

SUBJECTIVE REFRACTION METHOD AND DEVICE FOR CORRECTING LOW AND  
HIGHER ORDER ABERRATIONS

**Applicant:**

Lai, Shui T.

**Headword:**

**Relevant legal provisions:**

EPC Art. 54, 56, 123(2)

**Keyword:**

Amendments - extension beyond the content of the application  
as filed (no)

Novelty - (yes)

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
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Case Number: T 1916/14 - 3.2.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.02**  
**of 17 July 2018**

**Appellant:** Lai, Shui T.  
(Applicant) 6307 Little Lake Sawyer Drive  
Windermere, FL 34786 (US)

**Representative:** Stevenson-Hill, Jack Patrick  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 24 April 2014  
refusing European patent application No.  
07757012.5 pursuant to Article 97(2) EPC**

**Composition of the Board:**

**Chairman** E. Dufrasne  
**Members:** S. Böttcher  
D. Ceccarelli

## **Summary of Facts and Submissions**

I. The applicant filed an appeal against the decision of the Examining Division to refuse European patent application No. 07 757 012.5. The decision was dispatched on 24 April 2014.

Claim 1 of the main request was found not to comply with the requirements of Article 123(2) EPC, and the subject-matter of claim 1 of the auxiliary request was found to lack novelty over document:

D1: US-A-2004/0100619.

II. Notice of appeal was received on 2 July 2014. The appeal fee was paid on the same day. The statement setting out the grounds of appeal was received on 4 September 2014.

III. With a communication dated 9 April 2018 the appellant was summoned to attend oral proceedings. In the communication the Board raised further objections under Article 123(2) EPC against the main request and the auxiliary request. It also raised an objection under Article 53(c) EPC against the method claims.

IV. By letter of 15 June 2018 the appellant filed a main request and new auxiliary requests 1 to 6, and provided comments to address the matters raised in the Board's communication.

V. Oral proceedings took place on 17 July 2018.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of auxiliary request 7 filed during oral proceedings.

All other requests were withdrawn.

VI. Claim 1 of auxiliary request 7 reads as follows:

"A subjective refraction apparatus for generating a prescription for one or more corrective lenses for a patient, comprising:

- (a) at least one point light source configured to be disposed outside of the patient's eye as a viewing target, at a distance such as to provide substantially plane wave wavefronts; and
- (b) an optical assembly for initially forming a respective blurry image of the or each point light source at the patient's eye, the or each image comprising a refractive error of sphere, astigmatism or higher order aberrations (HOA), or combinations thereof, of the patient's eye, the optical assembly comprising one or more optics disposed along an optical path between the point light source and the patient's eye, wherein the optics are adjustable;

wherein the apparatus is configured for searching until the patient indicates at least one end point while looking at the image of the or each point light source, including:

- (i) converging the blurry image to become a more linear image;
- (ii) measuring the orientation of the linear image;
- (iii) converging the linear image by reducing its long dimension;
- (iv) focusing the image substantially into a point-like image; and
- (v) combinations of (i)-(iv); and

wherein the apparatus is configured to determine a prescription for a corrective lens for the patient's eye based on known parameters of the optical assembly

and on at least one adjusted position or orientation, or both, of the one or more optics of the optical assembly."

VII. The appellant's arguments are essentially those on which the following reasons for this decision are based.

### **Reasons for the Decision**

1. The appeal is admissible.
2. The invention as defined in claim 1 of auxiliary request 7

The invention relates to an apparatus for generating a prescription for one or more corrective lenses for a patient. The apparatus comprises a point light source as viewing target and an optical assembly for forming a blurry image of the point light source (i.e. a blurry line) at the patient's eye. The optics of the optical assembly can be adjusted under feedback by the patient such that the blurry line becomes a sharp line and the sharp line collapses into a small round shape. The patient then indicates that the image is at its tightest focus point. Based on the adjusted position of the optics the apparatus can determine a prescription for a corrective lens for the patient's eye.

According to the application, with the claimed apparatus it is possible to generate more accurate lens prescriptions which maximise the quality of vision (page 2, lines 2 to 4). In particular, by the use of a point light source as viewing target the drawbacks

associated with the use of eye charts can be eliminated (page 1, second paragraph, and page 2, third paragraph).

3. Basis in the original application - Article 123(2) EPC

The present application derives from international application No. WO-A-2007/095596. For the assessment of compliance with Article 123(2) EPC reference is made to this publication, hereinafter "the original application as published". Its content corresponds to the application as filed.

The subject-matter of claim 1 of auxiliary request 7 is largely based on claim 1 of the original application as published, with the claim category changed from a method claim to an apparatus claim.

The explicit indication in claim 1 of auxiliary request 7 that the point light source is disposed at a distance such as to provide substantially plane wave wavefronts reinstates the corresponding feature present in original claim 1. Hence, it addresses the corresponding reason for refusal of the application by the Examining Division.

In addition, the feature "configured to be disposed outside of the patient's eye as a viewing target at a distance such as to provide" can be derived from page 14, paragraph 2, and from the paragraph bridging pages 14 and 15 of the original application as published.

As far as concerns the replacement of the method step "searching by the patient for at least one end point" by the feature "the apparatus is configured for searching until the patient indicates at least one end

point", the Board notes that there are several passages in the description of the original application as published which support this amendment. For instance, in the first paragraph on page 5 it is mentioned that the optics of the optical assembly are adjusted until the patient indicates that the point light source has become substantially focused, i.e. that an end point is reached. Furthermore, in the last paragraph of page 8 it is stated that one lens of the defocus corrector assembly is movable until the patient indicates that the blurry image has become a sharp line image. In the last paragraph on page 23 an input device is described that is used by the patient to indicate the finding of an end point while the optics are adjusted.

For these reasons, the Board is satisfied that the subject-matter of claim 1 of auxiliary request 7 can be directly and unambiguously derived from the original application, thereby fulfilling the requirements of Article 123(2) EPC.

4. Novelty and inventive step - Articles 54 and 56 EPC

4.1 D1 relates to an adaptive ophthalmologic system for performing detailed vision assessments with the aim of detecting certain eye diseases or specifying prescriptions for correcting lenses.

The Board considers the following features of claim 1 not to be disclosed in D1:

- the apparatus being a subjective refraction apparatus;
- at least one point light source as a viewing target;



- the apparatus being configured for searching until the patient indicates at least one end point (...), including
  - (i) converging the blurry image to become a more linear image;
  - (ii) measuring the orientation of the linear image;
  - (iii) converging the linear image by reducing its long dimension;
  - (iv) focusing the image substantially into a point-like image; and
  - (v) combinations of (i)-(iv).

In D1, a testing unit used as a viewing target can be an eye chart, a video projector or a video monitor (paragraph [0022], last five lines). However, none of these testing units can be considered a point light source. Consequently, the image formed at the patient's eye by the viewing target of D1 is not a blurry image of a point light source (i.e. a blurred line) but a visual scene. Furthermore, in D1 the patient does not indicate any end point (e.g. a sharp line or a sharp point) while the optics are adjusted. Instead, the return light of the image created on the retina is analysed in a wavefront sensor and a correction is computed without any feedback from the patient (paragraphs [0023] and [0024]). The patient is merely asked to comment on the quality of the calculated correction (paragraph [0025]). Hence, D1 teaches an "objective refraction" method, wherein the appropriate correction is determined without any participation of the patient. In contrast, the present application relates to a "subjective refraction" method in which the correction prescription is attained by adjusting the optical assembly on a step-by-step basis until the patient indicates that he sees the sharpest image of the point light source. Thus, the apparatus of D1 is

not configured for searching until the patient indicates an end point.

It follows that the subject-matter of claim 1 of auxiliary request 7 is novel over D1 (Article 54(1) and (2) EPC).

- 4.2 The use of a point light source as viewing target has the technical effect of providing for clear and easily identified end points. This allows the quality of vision to be more accurately quantified in a subjective refraction measurement in less time.

The objective technical problem solved by the distinguishing features is therefore how to generate a precise and error-free prescription for a patient for his maximised visual acuity.

The Board notes that none of the documents cited in the international and supplementary European search reports discloses a refraction apparatus with a point light source as viewing target. Moreover, the subjective refraction methods mentioned in the description of the present application (page 1, section headed "Subjective refraction methods") use a phoropter and an eye chart as viewing target. Hence the skilled person would not have any motivation to replace the eye chart of the apparatus of D1 with a point light source.

For these reasons, the subject-matter of claim 1 of auxiliary request 7 involves an inventive step in view of the available prior art (Article 56 EPC).

5. The description has been brought into conformity with the amended claim.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent on the basis of:
  - claim 1 of auxiliary request 7 filed during oral proceedings;
  - pages 1 to 40 of the adapted description filed during oral proceedings; and
  - figure pages 1/9 to 9/9 of the published application.

The Registrar:

The Chairman:



D. Hampe

E. Dufrasne

Decision electronically authenticated