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**Datasheet for the decision  
of 8 January 2014**

**Case Number:** T 1764/09 - 3.4.02

**Application Number:** 05708847.8

**Publication Number:** 1728117

**IPC:** G02C7/08, G02C7/04, G02B3/14

**Language of the proceedings:** EN

**Title of invention:**  
VARIABLE FOCUS LENS

**Applicant:**  
Koninklijke Philips N.V.

**Headword:**

**Relevant legal provisions:**  
EPC 1973 Art. 56

**Keyword:**  
Inventive step: unconvincing argumentation, remittal to  
department of first instance

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 1764/09 - 3.4.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.02**  
**of 8 January 2014**

**Appellant:** Koninklijke Philips N.V.  
(Applicant) High Tech Campus 5  
5656 AE Eindhoven (NL)

**Representative:** Damen, Daniel Martijn  
Philips  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 17 April 2009  
refusing European patent application No.  
05708847.8 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman:** A. Klein  
**Members:** A. Hornung  
B. Müller

## Summary of Facts and Submissions

I. The applicant appealed against the decision of the examining division refusing European patent application N° 05708847.8 on the basis of Article 123(2) EPC (main and first auxiliary requests). In addition, the examining division stated that, even if the objection under Article 123(2) EPC were overcome by suitable amendments, then the claimed subject-matter of claims 1 of both requests would lack an inventive step under Article 56 EPC.

II. The applicant requested that the decision of the examining division be set aside and that a patent be granted on the basis of the main request filed with its letter dated 13 August 2009, or of any of auxiliary requests 1 to 2.

III. The following documents of the first instance proceedings will be referred to in the present decision.

D1: "On the possibility of intraocular adaptive optics", Gleb Vdovin et al., Optics Express, vol. 11, No. 7, 7 April 2003, pages 810-817, XP 002323798

D2: "Variable focal lens controlled by an external voltage: An application of electrowetting", B. Berge et al., The European Physical Journal E, Vol. 3, October 2000, pages 159-163, XP 002285977

D3: US 6,369,954

D4: WO 00/58763

D5: US 5,712,721

IV. Independent claim 1 according to the main request reads as follows:

"A variable focus lens (2, 26) being adapted for a contact lens or an intraocular lens comprising a transparent rear wall (8, 28), a transparent front wall (6, 106) having a

convex curved surface (10) and a concave inner surface (19), a cavity (14, 114) formed between the transparent front wall and the transparent rear wall, first and second immiscible fluids (16, 17) of differing refractive index contained within said cavity, and electrodes (18, 21) to which a voltage is able to be applied to change the curvature of a fluid meniscus (4, 104) between the two fluids, wherein at least the rear wall of the lens includes a biocompatible material, which material provides for biocompatibility of the lens with the eye and a periphery of the front wall joins a periphery of the rear wall to form an acute internal angle ( $\alpha$ ) at their joining region (J)."

## **Reasons for the Decision**

### **1. *Amendments***

The examining division was of the opinion that claim 1 then on file contained added subject-matter because the feature of claim 1 "a variable focus lens for an eye comprising (...) a transparent front wall having (...) a concave inner surface" had no sufficient basis in the application as filed, since the "concave inner surface" was originally disclosed only in the figures 1 to 4 relating specifically to a contact lens or an intraocular lens.

With the notice of appeal, the applicant filed an amended claim 1 directed to a variable focus lens being explicitly "adapted for a contact lens or an intraocular lens", thereby overcoming the examining division's objection under Article 123(2) EPC.

### **2. *Inventive step***

The board is not convinced that the invention is obvious in the light of the available prior art (Article 56 EPC 1973).

2.1 The invention generally relates to a lens adapted for a contact lens or an intraocular lens. Its focal length can be varied by controlling the voltage applied to electrodes so as to change the curvature of a fluid meniscus between two immiscible fluids, based on the physical phenomenon of electro-wetting.

2.2 No prior art is available disclosing the use of electro-wetting in such a lens.

A first category of prior art documents, such as D1 or D5, relates to variable focus lenses adapted for contact or intraocular lenses, whose focal length can be varied electrically like in the claimed device. However, all of these conventional lenses use a layer of liquid crystal material between electrodes. The orientation of the liquid crystal molecules follows the gradual distribution of the voltage applied to the electrodes, in such a way as to achieve optical wavefront correction. This corresponds to a fundamentally different physical principle than that on which the invention is based.

A second category of prior art documents, such as D2, D3 or D4, relates to variable focus lenses controlled by an external voltage and using, as in claim 1, two immiscible fluids for varying their focal length via the physical effect of electro-wetting. However, the electrical, optical and mechanical properties of the lenses of D2, D3 or D4 are such that they are clearly not adapted for a contact or intraocular lens since their focal length is variable at high voltages, generating a large optical power variation. For instance, in D2, the applied voltage varies in the range of 90V to 250V, generating an optical power variation from

around 55 dioptries to around 120 dioptries, which is at least an order of magnitude above the optical power required for eye sight correction. The lens of D2 is made of a liquid cell glued into a stainless steel ring for mechanical integrity. D3 discloses a lens which "achieves approximately 40 dioptries of focus variation for an applied voltage of 250 volts" (see D3, column 7, lines 2-7). The practical applications mentioned in documents D2, D3 and D4, such as lenses for optical readers or endoscopes, are remote from the use as contact or intraocular lenses (see e.g. document D2, figures 1 and 3; page 160, second paragraph of the right-hand column; page 161, left-hand column; page 162, right-hand column).

2.3 The board is unable to establish any convincing chain of considerations which could have led the skilled person from the above prior art to the claimed subject-matter in any obvious way.

2.3.1 In this respect the board notes that the examining division in a first line of arguments started from document D1 as the closest prior art, defining the technical problem as finding an alternative to the liquid crystal wavefront correction technology disclosed there, and concluding that such an alternative would be obvious from document D3 with its electro-wetting principle.

In the board's view, this argumentation is tainted with hindsight. In addition to the fact that the lenses of document D3 for the reasons set out above would prima facie not be considered suitable for use in the intraocular lens of document D1, the selection of the latter as the closest prior art is quite questionable. Indeed, it is doubtful whether the disclosure in document D1 actually enables the skilled person to manufacture a variable focus lens adapted for a contact lens or an intraocular lens: this document, as accurately reflected in its title "On the possibility of intraocular

adaptive optics", is no more than a speculative review of what might be potentially feasible in the future. D1 concludes that "it seems possible to develop a wireless control adaptive contact lens or eye implant" (page 817, last paragraph). No concrete realization of a fully adapted lens for a contact or intraocular lens is described in D1. Therefore, for this reason alone, document D1 cannot objectively be considered as a realistic starting point or the most promising springboard towards the claimed invention.

2.3.2 In an alternative line of argumentation, the examining division started from the variable focus lens of document D3. It considered that the claimed features were obvious responses to the constraints imposed on the skilled person striving to solve the objective technical problem which it defined as being "to modify the lens of D3 such that it can be used as a contact or intraocular lens". This problem formulation, in the board's view is flawed in that it actually contains part of the claimed solution.

2.4 For these reasons the decision of the examining division must be set aside.

3. Further prosecution

3.1 There is no indication in the file that the examining division has examined compliance of the present application with the requirements of Article 83 EPC 1973 concerning sufficiency of the disclosure, let alone that the division has taken a favourable stance in this respect.

Obviously, there is very little information in the present application as to a practical realization of a lens as claimed, which must exhibit electrical, optical, mechanical and biological characteristics specifically compatible with an application as a contact or intraocular lens. For

instance, even though the application, on page 9, lines 1-29, refers to the actuation and control of the variable focus lens by using a voltage source system in a wireless manner, no concrete details about how this electrical control system is implemented for practical use in a contact or intraocular lens is disclosed. Similarly, present claim 1 defines in general terms an acute internal angle at the joining periphery region of the front and rear wall of the lens but provides no concrete details concerning the exact elaboration of the periphery lens portion including electrodes for controlling the variable focus lens.

The board notes in this respect the following statement in the appealed decision:

"Moreover, it is true that the documents of D2 to D4 show variable focus lenses which are used for other purposes so that the dimensions are different, but this does not seem to be a fundamental problem because the present application does not teach any particular measures which are to be taken in order to adapt the electro-wetting principle for the particular task. As a consequence, the skilled person knows how to adapt the lenses. **Otherwise, the invention would not be completely disclosed.**" (see point 2.1.6, penultimate paragraph, emphasis added)

This statement seems to indicate that in the examining division's view, if the claimed subject-matter were considered inventive, then the application might offend against the requirements of Article 83 EPC 1973.

The board does not follow the examining division's conclusions as to inventive step based on the documents D1 to D5. So, the issue of sufficiency of the description now arises.



3.2 Accordingly the board decides to make use of its discretion under Article 111(1) EPC 1973 in remitting the case to the examining division for further prosecution.

Since a decision to remit the case to the first instance does not adversely affect the appellant, the board sees no need to appoint oral proceedings as conditionally requested by the appellant.

## 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 for further prosecution.

The Registrar:

The Chairman:



M. Kiehl

A. Klein

Decision electronically authenticated