Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 16 January 2020

Case Number: T 1313/14 - 3.5.04

Application Number: 06018707.7

Publication Number: 1763258

IPC: H04N13/00, G02B21/22

Language of the proceedings: EN

Title of invention:
Medical stereo observation system

Patent Proprietor:
Olympus Corporation

Opponent:
Carl Zeiss AG

Headword:

Relevant legal provisions:
EPC Art. 100(b), 83, 123(3)

Keyword:
Grounds for opposition - insufficiency of disclosure (yes)
First auxiliary request - sufficiency of disclosure - (no)
Second auxiliary request - extension of conferred scope of protection (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1313/14 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 16 January 2020

Appellant: (Opponent)	Carl Zeiss AG Carl-Zeiss-Straße 22 73447 Oberkochen (DE)
Representative:	Diehl & Partner GbR Patentanwälte Erika-Mann-Straße 9 80636 München (DE)
Respondent: (Patent Proprietor)	Olympus Corporation 2951 Ishikawa-machi, Hachioji-shi, Tokyo 192-8507 (JP)
Representative:	von Hellfeld, Axel Wuesthoff & Wuesthoff Patentanwälte PartG mbB Schweigerstraße 2 81541 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 April 2014 rejecting the opposition filed against European patent No. 1763258 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	C. Kunzelmann
Members:	B. Willems
	B. Müller

Summary of Facts and Submissions

I. The appeal is against the decision of the opposition division rejecting the opposition against European patent No. EP 1 763 258 (Article 101(2) EPC).

Claim 1 of the patent in suit as granted specifies a stereo medical observation system in which limit values for the distance *x* from the intersection of the optical axes of both imaging optical systems to the focal plane are defined in terms of the working distance *WD* of the stereo imaging unit, the diagonal field angle *ω1* of each of the imaging optical systems, the angle *α* made on the object side by the optical axes of both imaging optical systems, and the diagonal distance *L* of an observation image in the stereo display unit.

II. Notice of opposition to the patent had been filed by Carl Zeiss AG. The opposition was based on the grounds under Article 100(a) and (b) EPC.

III. The documents cited in the decision under appeal included the following:

D1: JP 8 313828 A (including the abstract and an English machine translation); and

D5: US 4,673,260.

In the appeal proceedings, the following document was submitted by the parties:

D16: Helmut Naumann: "*Bauelemente der Optik: Taschenbuch der technischen Optik*"; 6th, revised edition, 1992, pages 122 and 123.

IV. The opposition division rejected the opposition because neither the ground under Article 100(a) EPC nor the ground under Article 100(b) EPC prejudiced the maintenance of the European patent.

V. The opponent (appellant) filed notice of appeal. With the statement of grounds of appeal, it requested that the decision under appeal be set aside and the patent be revoked, and submitted a copy of document D16. It sought to refute the opposition division's reasoning set out in the section "*Art. 100(b) EPC (Sufficiency of disclosure)*" and submitted arguments as to why the patent did not disclose the claimed invention in a manner sufficiently clear and complete for it to be carried out by the skilled person. The appellant summarised the disclosures of the available prior-art documents and concluded that it would have been obvious for the skilled person to combine components of stereo observation systems known from these documents to achieve a technical result which could be expected, i.e. to optimise conditions for the user of the medical stereo observation system (see statement of grounds of appeal, points 4.1.6 and 4.3). The appellant put forward that no results of comparative tests demonstrating that users of prior-art medical stereo observation systems suffered more of fatigue were available (see statement of grounds of appeal, point 4.1.3).

In a letter dated 20 April 2015, the appellant contested that the problem to be solved was to fight fatigue and argued that the person skilled in the art would not know which values to substitute for *L* and *WD*.

VI. The patent proprietor (respondent) filed a reply to the appeal requesting that the appeal be dismissed and that

the European patent be maintained as granted. It refuted the appellant's arguments, and submitted that the skilled person would know how to adjust *x*, *WD*, α, $\omega 1$ and *L* to satisfy the claimed inequality (see reply to the appeal, page 28). In its arguments, the respondent recurrently mentioned passages from a text book concerning optics: E. Hecht, "*Optik*", 1989 (which will be referred to as "*Hecht*"). It summarised the prior-art documents (see reply to the appeal, point "*IV.3 Prior art*"), reasoned that the opposition division correctly identified the objective technical problem to be solved (see reply to the appeal, page 5), and pointed out the differences between the claimed subject-matter and each of the prior-art documents.

In a letter dated 27 May 2015, the respondent refuted that it had used a different person skilled in the art in its assessment of inventive step and its assessment of sufficiency of disclosure. It argued that only one problem could be derived from the patent in suit: facilitating stereo observation without feeling fatigue and discomfort.

VII. In a communication under Article 15(1) RPBA 2007 (Rules of Procedure of the Boards of Appeal, OJ EPO 2007, 536), annexed to the summons to oral proceedings, the board directed the respondent to file a copy of all the pages of "*Hecht*" referred to in the reply to the appeal (Article 12(2)(b) RPBA), and expressed, *inter alia*, the following provisional opinion.

(a) The distance *L* might vary during (or with) the (surgical) use of the system, and the person skilled in the art constructing the system would not know which values to substitute for *L* (see communication, point 5.5).

(b) The claimed invention was not sufficiently disclosed because some of the parameters in the mathematical inequality were so vaguely defined that the skilled person could not identify, in the patent as a whole, the measures required to solve the underlying problem (see communication, points 5.6 and 5.7).

(c) It was to be discussed whether the claimed inequality solved any technical problem and, if so, whether the problem identified by the respondent should be reformulated. If the problem to be solved was to facilitate the adjustment of the focal length with respect to the intersection of the optical axes of the first and second optical systems, the board would tend to agree with the appellant that the person skilled in the art would provide the adjustment known from document D5 in the system known from D1.

VIII. In reply to the board's communication, the respondent submitted a copy of "*Hecht*" and claims according to auxiliary requests I and II. It presented reasons as to why the invention was sufficiently disclosed and the subject-matter of claim 1 of each of the requests was inventive over the cited prior art.

IX. In reply to the board's communication, the appellant submitted reasons as to why it agreed with the board that the invention was not sufficiently disclosed. It maintained that the subject-matter of claim 1 did not solve the alleged technical problem and contested that the problem to be solved might be identified as how to facilitate the adjustment of the focal length with respect to the intersection of the optical axes of the first and second optical systems.

X. Oral proceedings before the board were held on 16 January 2020.

During the oral proceedings, the appellant and the respondent in essence reiterated the arguments set out in the written proceedings with respect to sufficiency of disclosure. The appellant objected that claim 1 of the second auxiliary request had been amended so as to extend the protection conferred by the patent (Article 123(3) EPC). The respondent presented arguments trying to demonstrate that the scope of protection conferred by the patent had not been extended.

The appellant confirmed its final requests as follows: it requested that the decision under appeal be set aside and that the patent be revoked.

The respondent confirmed its final requests as follows: it requested that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of the claims according to auxiliary request I or auxiliary request II, both requests filed with the letter dated 5 November 2019 in reply to the boards's communication.

At the end of the oral proceedings, the chairman announced the board's decision.

XI. Claim 1 of the granted patent reads as follows:

"A medical stereo observation system comprising:
a stereo imaging unit (135; 165) having a first imaging optical system (143L; 174L) for producing a first image for a left eye and a second imaging optical system (143R; 174R) for producing a second image for a right

eye, the first image and the second image mutually having parallax; and

a stereo display unit (136; 167) for displaying stereoscopically the images produced by the stereo imaging unit,

focal positions of the first imaging optical system and the second imaging optical system being located on an object side of an intersection of optical axes of the first imaging optical system and the second imaging optical system,

characterized in that the following condition is satisfied:

$$\{5.9 \times WD \times \tan(\omega 1/2)\}/\{L \times \tan(\alpha/2) + 5.9 \times \tan(\omega 1/2)\}$$

$$\leq x\ (mm) \leq$$

$$\{21.7 \times WD \times \tan(\omega 1/2)\}/\{L \times \tan(\alpha/2) + 21.7 \times \tan(\omega 1/2)\}$$

where *x* is a distance from the intersection of the optical axes of the first imaging optical system and the second imaging optical system to a straight line connecting a center of an object-side focal plane of the first imaging optical system with a center of an object-side focal plane of the second imaging optical system,

WD is a working distance of the stereo imaging unit, which is defined as a distance from a most object-side surface of the stereo imaging unit to object-side focal positions of the stereo imaging unit,

ω1 is a diagonal field angle of each of the first imaging optical system and the second imaging optical system,

α is an angle made on the object side by the optical axes of the first and second imaging optical systems, and

L is a diagonal distance of an observation image in the stereo display unit."

XII. Claim 1 of auxiliary request I further comprises the following feature, appended at the end of claim 1 of the patent as granted, immediately before the full stop:

"wherein *WD* = 250 mm and *L* = 508 mm, or
wherein *WD* = 50 mm and *L* = 478 mm".

XIII. Claim 1 of the second auxiliary request reads as follows:

"A medical stereo observation system comprising:

a stereo imaging unit (135; 165) having a first imaging optical system (143L; 174L) for producing a first image for a left eye and a second imaging optical system (143R; 174R) for producing a second image for a right eye, the first image and the second image mutually having parallax; and

a stereo display unit (136; 167) for displaying stereoscopically the images produced by the stereo imaging unit,

focal positions of the first imaging optical system and the second imaging optical system being located on an object side of an intersection of optical axes of the first imaging optical system and the second imaging optical system,

characterized in that:

WD = 250 mm, α = 4°, *ω1* = 20°, *x* = 40 mm and *L* = 508 mm, or
WD = 50 mm, α = 6.9°, *ω1* = 60°, *x* = 12 mm and *L* = 478 mm,

where *x* is a distance from the intersection of the optical axes of the first imaging optical system and the second imaging optical system to a straight line connecting a center of an object-side focal plane of the first imaging optical system with a center of an object-side focal plane of the second imaging optical system,

WD is a working distance of the stereo imaging unit, which is defined as a distance from a most object-side surface of the stereo imaging unit to object-side focal positions of the stereo imaging unit,

ω1 is a diagonal field angle of each of the first imaging optical system and the second imaging optical system,

α is an angle made on the object side by the optical axes of the first and second imaging optical systems, and

L is a diagonal distance of an observation image in the stereo display unit."

XIV. The opposition division's arguments, where relevant to the present decision, may be summarised as follows.

The only meaningful interpretation of granted claim 1 was with *WD* and *L* expressed in mm. Although the patent did not explain how the inequality defined in claim 1 was derived or how the addition in the denominator could result in a distance unit, the skilled person would understand that the problem of fatigue was solved by choosing the parameters such that the claimed condition (expressed as an inequality in the claim) was satisfied. An appropriate combination of units for *WD* and *L* would lead to a result in mm. Hence, the invention was sufficiently disclosed in the patent in suit (see decision under appeal, points 1.10 and 1.11).

XV. The appellant's arguments, where relevant to the present decision, may be summarised as follows.

(a) The claimed mathematical inequality was defined by fractions in which physical quantities with the dimension of a length were added to dimensionless variables (see statement of grounds of appeal, point 3.3.1).

(b) A comparison with the length *x* only made sense if 5.9 and 21.7 were values of lengths. Nothing in the patent hinted at which element's length was meant (see appellant's reply to the board's communication, point 2.2, page 2, fourth full paragraph).

(c) Granted claim 1 specified an inequality defining the limit values of a range for *x*. Claim 1 of the second auxiliary request no longer specified this inequality. Therefore, the wording of claim 1 of

the second auxiliary request had been amended so as to extend the scope of protection conferred by the patent (Article 123(3) EPC).

XVI. The respondent's arguments, where relevant to the present decision, may be summarised as follows.

(a) An invention was only insufficiently disclosed if the skilled person was not able to rebuild the invention. This was confirmed by T 593/09, Reasons, last sentence of point 4.1.4, and T 378/11. The questions of whether *WD* and *L* were to be inserted in m or mm and how to use the constant values were a matter of clarity, not of sufficiency of disclosure (see respondent's reply to the board's communication, page 4, first to fourth full paragraphs).

(b) The invention achieved stereo viewing of a large depth space without fatigue by choosing the parameters *x*, *WD*, *L*, *ω1*, α such that the condition defined by the claimed inequality was satisfied (see reply to the appeal, page 16, first to third paragraphs).

The parameters *WD*, *ω1* and *α* were defined in the claim, and the description set out examples how to determine the values of these parameters. The description of the second and third embodiments specified values for *WD* and *L* and lower and upper limits for *x* in mm. The skilled person in doubt as to which values to insert into the inequation of claim 1 would compare the results of different approaches with the values in the description and, without undue burden, arrive at the conclusion that (i) the values for *WD* and *L* had to be provided

in mm, and (ii) the constant values 5.9 and 21.7 simply had to be inserted into the calculations. Entering the formula of the inequation into a calculator (without any units) would result in the exemplary limit values.

This sufficed to carry out the invention and to solve the problem of not bringing about the feeling of fatigue (see reply to the appeal, page 16, fourth paragraph and respondent's reply to the board's communication, page 3, last paragraph to page 4, first paragraph).

(c) The values 5.9 and 21.7 might not directly correspond to a physical property of the claimed system, but they might be a product of physical properties of the claimed system with other constants or measurements. These values might even be related to physical properties of the human eye rather than physical properties of the claimed system (see respondent's reply to the board's communication, page 5, first paragraph).

(d) The condition extracted from the experiment described in paragraphs [0016] to [0019] was parameterised in the claimed inequality (see reply to the appeal, page 7, third and fourth paragraphs).

(e) Figures 8 and 9 of the patent in suit showed two cases in which a considerable part of the object 83 was outside of the comfort observable range 82 because the focal positions did not meet the condition defined in claim 1. This led to fatigue due to large parallax. The specific range in which the user could operate without fatigue was defined

in the inequation of claim 1 with the constant values 5.9 and 21.7 (see respondent's reply to the board's communication, paragraph bridging pages 5 and 6).

(f) By trial and error, the person skilled in the art could construct a medical stereo observation system such that the parameters *x*, *WD*, *L*, *ω1*, *α* met the condition specified in granted claim 1 and claim 1 of the first auxiliary request. Claim 1 of the first auxiliary request specified values for *WD* and *L*. Because the person skilled in the art did not have to select values for *WD* and *L*, the burden for configuring an appropriate system was reduced.

(g) Granted claim 1 defined the limits of a range for *x*. It was apparent from the calculations set out in paragraphs [0056] and [0062] of the granted patent that the values specified in claim 1 of the second auxiliary request fell within the originally claimed range. Therefore, the subject-matter of claim 1 of the second auxiliary request was limited to two specific embodiments which fell within the range defined in granted claim 1. Hence, the scope of protection had been limited rather than extended.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request - sufficiency of disclosure (Article 100(b) EPC)*

2.1 An invention should be disclosed in a manner sufficiently clear and complete for it to be carried

out by a person skilled in the art, on the basis of the disclosure in the patent specification and the general technical knowledge in the art.

If an essential feature of the invention is expressed by a parametric definition, the question is whether the parameter is so defined that the skilled person, on the basis of the disclosure of the patent as a whole and using their common general knowledge, could identify, without undue burden, the technical measures leading to the claimed subject-matter (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019 ("Case Law"), II.C.5.5).

2.2 Claim 1 of the main request specifies that the distance *x* from the intersection of the optical axes of the first imaging optical system and the second imaging optical system to a straight line connecting a centre of an object-side focal plane of the first imaging optical system with a centre of an object-side focal plane of the second imaging optical system has to satisfy the following condition:

$$\{5.9 \times WD \times \tan(\omega 1/2)\}/\{L \times \tan(\alpha/2) + 5.9 \times \tan(\omega 1/2)\}$$

$$\leq x \leq$$

$$\{21.7 \times WD \times \tan(\omega 1/2)\}/\{L \times \tan(\alpha/2) + 21.7 \times \tan(\omega 1/2)\},$$

with the distance *x* expressed in millimetres.

2.3 In the present case, it needs to be examined whether the patent in suit and the common general knowledge provide sufficient information allowing the person skilled in the art to construct or configure the

claimed medical stereo observation system (see also point XVI(a) above).

2.4 The mathematical inequality cited in point 2.2 above is defined by fractions in which physical quantities with the dimension of a length are added to dimensionless variables (see points XIV and XV(a) above). This addition *per se* does not make any technical sense.

2.5 The board has not been persuaded that an appropriate combination of units for *WD* and *L* would lead to a result for *x* in mm (see points XIV and XVI(a) above).

2.5.1 The result of the fractions can only be expressed in mm if, apart from *WD* and *L*, the values 5.9 and 21.7 represented lengths measured in mm. The patent neither discloses any system parts with such length (see point XV(b) above), nor does it hint at physical properties of the claimed system influencing these values (see point XVI(c) above). Given the complexity of the claimed system, the board is not convinced that a reasonable amount of trial and error would enable a person skilled in the art to determine which system components or parameters should be dimensioned such that they could be characterised by the values 5.9 and 21.7 (see points XVI(b) and XVI(f) above). Hence, it would be an undue burden to the person skilled in the art to configure a system characterised by these values.

2.5.2 If the values 5.9 and 21.7 related to physical properties of the human eye (see point XVI(c) above), then the patent does not provide sufficient instructions, and common general knowledge cannot be relied on to determine how the strongly varying values

of parameters characterising human vision influence the construction of the claimed system.

2.5.3 The patent discloses in paragraphs [0016] to [0018] that the "*vergence distance*" (i.e. the distance from the eyes to a position where left and right lines of sight cross) and the "*adjusting distance*" (i.e. the distance from the eyes to the focal position of the eyes) are coincident in ordinary natural observation but differ from each other in stereo observation. To avoid fatigue and discomfort in stereo observation, their difference must be within a certain limit. The patent indicates that if the condition

$$0.9 \leq \text{vergence distance/adjusting distance} \leq 1.325$$

is fulfilled, comfortable stereo observation is possible close to the display surface. However, the patent does not disclose any information about how the inequality given in claim 1 can be derived from this condition.

In particular, the patent does not disclose any details of the experimental set-up referred to in paragraphs [0016] to [0019] which resulted in the condition expressed by the inequality given in claim 1 (see point XVI(d) above).

2.5.4 If, for the sake of argument, Figures 8 and 9 illustrated that there existed a specific range in which the user could operate without fatigue (see point XVI(e) above), these figures and the corresponding parts of the description do not provide sufficient information to arrive at the inequation of claim 1 with the constant values 5.9 and 21.7 specifying this range.

2.5.5 As set out by the respondent (see points XVI(b) and XVI(g) above), simply entering the constant values 5.9 and 21.7 (together with the values for *WD*, *L*, *ω1*, *α*) of the second and third embodiments in the fractions of claim 1 and ignoring any units when calculating the fractions results in the exemplary limit values in the second and third embodiments. However, as discussed in point 2.5.1 above, it requires undue burden to determine parameters of the medical stereo observation system which are characterised by these values. Moreover, the board is not convinced that the person skilled in the art would simply ignore units when calculating technical formulae (unless they are implicit) or, when comparing the results of the calculations with the values in the description, would conclude that the constant values 5.9 and 21.7 simply have to be inserted into the calculations. Rather, the board is of the opinion that the person skilled in the art would notice that the limits specified in the second and third embodiments are expressed in millimetres, and therefore the result of the fractions should be expressed in millimetres (see point XVI(b) above).

Even if the values 5.9 and 21.7 were dimensionless parameters to be multiplied with the unit millimetre or physical lengths of the optical system in the experiment expressed in millimetres, the patent does not disclose any information on how these parameters effected the result of large depth space without fatigue. The person skilled in the art would not know whether the inequality was only valid for specific systems characterised by these values, or whether (and how) the inequality had to be modified for different optical systems.

2.6 In view of the above, the European patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC).

3. *Auxiliary request I - sufficiency of disclosure (Article 83 EPC)*

3.1 Claim 1 of the first auxiliary request differs from claim 1 of the patent as granted in that it further specifies values for the lengths *WD* and *L* in millimetres. The board is not convinced that setting values for *WD* and *L* reduces the burden for the person skilled in the art (see point XVI(f) above) to determine which system components or parameters should be dimensioned such that they could be characterised by the values 5.9 and 21.7. In the formulae of claim 1 of each of the requests, the parameters *WD* and *L* are independent of the values 5.9 and 21.7, and the patent does not disclose any technical teaching that the values of 250 (or 50) mm for *WD* and 508 (or 478) mm for *L* have an influence on the parameters which can be characterised by the values of 5.9 and 21.7. Therefore, the objections raised in points 2.1 to 2.6 apply *mutatis mutandis* to the invention specified in claim 1 of the first auxiliary request.

3.2 In view of the above, the European patent in the amended form according to the first auxiliary request does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (see the corresponding requirement of Article 83 EPC for the European patent application).

4. *Auxiliary request II - extension of conferred protection (Article 123(3) EPC)*

4.1 Under Article 123(3) EPC, the patentee is generally allowed to redraft, amend or delete the features of claims and is not bound to specific terms used in the claims as granted as long as the new wording of the claims does not extend the scope of protection conferred as a whole by the patent as granted (see Case Law, 9th edition 2019, II.E.2.2).

4.2 Claim 1 of the granted patent defined an inequality setting out limit values for x based on the parameters WD, L, $\omega 1$, α and the constant values 5.9 and 21.7. Claim 1 of the second auxiliary request no longer specifies this inequality.

4.3 The board agrees with the appellant that removing the inequality from the claim extends the scope of protection conferred by the patent (see point XV(c) above). The board is not convinced that by specifying the values for WD, L, $\omega 1$, α and x of the second and third embodiments the scope of protection is limited (see point XVI(g) above). The values for x fall within the range calculated in each of the embodiments. However, in claim 1 of the granted patent, the limit values for x were determined taking into account the values 5.9 and 21.7. Irrespective of which system components are characterised by these values (see point 2.5.1 above), the scope of protection conferred by the granted patent was limited to a system in which some (unknown) components were characterised by these values. This limitation is no longer present in the system according to claim 1 of the second auxiliary request. In particular, it is not implicit from the patent that any medical stereo observation system

having values for *WD*, *L*, *ω1*, *α* and *x* which are the same as those of the second or third embodiments will also have the same (unknown) parameters characterised by the values of 5.9 and 21.7 as the second or third embodiments.

4.4 In view of the above, claim 1 of the second auxiliary request extends the scope of protection conferred as a whole by the patent as granted (Article 123(3) EPC).

5. Since none of the respondent's requests is allowable, the patent is to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

K. Boelicke C. Kunzelmann

Decision electronically authenticated