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Datasheet for the decision of 15 September 2009

Case Number: T 1763/06 - 3.4.02

Application Number: 99308360.9

Publication Number: 0996023

IPC: G02C 7/02

Language of the proceedings: EN

Title of invention:
Progressive addition lenses

Patentee:
ESSILOR INTERNATIONAL

Opponent:
Rodenstock GmbH
Essilor International (Cie Générale d'Optique)

Headword:
-

Relevant legal provisions:
EPC Art. 117(1)(e), 123(2)
RPBA Art. 13(1)

Relevant legal provisions (EPC 1973):
EPC Art. 54(1), 56, 83, 100(a), 100(b), 100(c), 107

Keyword:
"Admissibility of appeal (yes)"
"Admissibility of amended claim request (yes)"
"Added subject-matter (no)"
"Sufficiency of disclosure (yes)"
"Novelty and inventive step (yes)"
"Offer of experts' opinion (not followed)"

Decisions cited:
T 0528/93, T 0840/93, T 0382/96, T 0378/97, T 0774/97, T 0168/99, T 0054/00, T 0252/02, T 0386/04, T 0608/07

Catchword:
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Case Number: T 1763/06 **-** 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 15 September 2009

Appellant: (Patent Proprietor)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 19 October 2006 concerning maintenance of the European patent No. 0996023 in amended form.

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
B. Müller

Summary of Facts and Submissions

I. Both the patent proprietor and opponent I lodged an appeal against the interlocutory decision of the opposition division finding European patent No. 0996023 (based on European patent application No. 99308360.9) as amended according to the third auxiliary request then on file to meet the requirements of the EPC 1973.

II. The oppositions filed by opponent I (in the following "the opponent") and opponent II against the patent as a whole were based on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC 1973), lack of sufficiency of disclosure (Article 100(b) EPC 1973) and added subject-matter in respect of the expression "about" in independent claims 1 and 10 of the patent as granted (Article 100(c) EPC 1973).

Opponent II (now patent proprietor) withdrew its opposition during the first-instance proceedings.

III. Among the documents considered during the first-instance proceedings, the following documents were referred to by the parties during the appeal proceedings:

P1 : EP-A-0809127
P2 : DE-A-3430334 and P2': DE-C2-3430334
P3 : GB-A-775007
P4 : DE-A-3331763
P5 : DE-A-3331757
P6 : US-A-5726734

P7 : "Über den Flächenastigmatismus bei gewissen symmetrischen Asphären", G. Minkwitz; Optica Acta, 10, 1963; pages 223 to 227

P8 : "Einstärken- und Mehrstärken-Brillengläser", A. Schikorra; Verlag der Deutschen Optikerzeitung, Scharr GmbH, Stuttgart (DE), 1994; pages 232 to 248

P9 : "Brille und Auge", H. Presser; Lehrbuch für Augenoptiker, CHK-Verlag, Stephanskirchen (DE), 1995; pages 216 to 238

P10 :"Die Optik des Auges und der Sehhilfen", R. Enders; Verlag der Deutschen Optikerzeitung, Schaab & Co GmbH, Düsseldorf (DE), 1995; pages 187 to 191

P18 :International Standard ISO 8980-2, 1st ed. 1996, "Ophthalmic optics - Uncut finished spectacle lenses - Part 2: Specifications for progressive power lenses", International Organization for Standardization (CH), 1996; pages 1 to 8

P24 :results of simulations of a lens disclosed in document P1, filed by the opponent with a letter dated 24.05.2006.

Of the documentary evidence submitted by the patent proprietor during the appeal proceedings, the following is mentioned in the present decision:

Annex A1 : declaration of B. Maitenaz dated 23.02.2007

Annex A2 : declaration of C. W. Fowler dated 20.02.2007

Annex D : declaration of Y. Lefetz dated 27.11.2007

Annex K : results of simulations of a lens disclosed in document P1, filed by the patent proprietor with a letter dated 27.07.2009.

The opponent offered as evidence in support of some of its submissions the appointment of an expert to give an expert's opinion under Article 117 (1) (e) EPC, and the patent proprietor declared that the authors of the declarations shown in Annex A1 and A2 were available for any means under Article 117 EPC that the Board might judge to be useful.

IV. Oral proceedings took place on 15 September 2009.

The patent proprietor submitted a new set of claims 1 to 5 amended according to the main and sole request and requested setting aside of the decision under appeal and the maintenance of the patent in amended form according to the amended set of claims.

The opponent requested setting aside of the decision under appeal and the revocation of the patent.

At the end of the oral proceedings the Board announced its decision as recorded in the order below.

V. The main request includes independent claims 1 and 5 reading as follows:

"1. A lens, such as a spectacle lens, comprising a first progressive addition surface having one or more areas of maximum, localized unwanted astigmatism and a first dioptric add power and second progressive addition surface having one or more areas of maximum, localized unwanted astigmatism and a second dioptric add power, the progressive addition surfaces disposed in relation to each other so that a portion or all areas of maximum, localized unwanted astigmatism are

misaligned and wherein the dioptric add power of the lens is about the sum of the first and second dioptric add powers
wherein by "progressive addition surface" is meant a continuous, aspheric surface having far and near vision zones and a zone of increasing dioptric power connecting the far and near vision zone."

"5. A process for producing a lens comprising the steps of:
providing at least a first and a second progressive addition surface, the first progressive addition surface having one or more areas of maximum, localized unwanted astigmatism and a first dioptric add power and the second progressive addition surface having one or more areas of maximum, localized unwanted astigmatism and a second dioptric add power; and
disposing the first and second progressive addition surfaces so that all or a portion of the areas of maximum, localized unwanted astigmatism are misaligned and the dioptric add power of the lens is about the sum of the first and second dioptric add powers
wherein by "progressive addition surface" is meant a continuous, aspheric surface having far and near vision zones and a zone of increasing dioptric power connecting the far and near vision zone."

Claims 2 to 4 are dependent claims all referring back to claim 1.

VI. The arguments submitted by the patent proprietor in support of its requests and pertinent for the present decision are essentially the following:

The amendments brought to the claims during the appeal proceedings, and in particular the deletion of dependent claims as granted, are in reply to objections raised during the proceedings. The independent claims as granted have been amended according to the present request only to explain the meaning of "progressive surface" as defined in the description and this amendment does not change the technical nature of the invention discussed during the proceedings. There is no reason for not admitting the amendments pursuant to Article 13 RPBA, see decisions T 386/04 and T 168/99.

The examples and paragraph [0032] of the application as filed clearly show that the dioptric add powers of the lens surfaces are not strictly additive and this justifies the term "about" in the independent claims.

The astigmatism is measurable in a lens and an "area of maximum, localized unwanted astigmatism" corresponds with a region extending around a point of maximum localized unwanted astigmatism (paragraph [0020] of the patent specification, and declarations in Annex A1 and A2). There are different known methods for determining the topography, the optical power and the astigmatism distribution of the surfaces of a progressive lens. It is then possible to identify without ambiguity the areas of maximum astigmatism by tracing the curves of isoastigmatism when the topography of the lens surfaces is known. The selection of one of the different methods does not have a substantial effect on the final result (declaration in Annex D). The patent then teaches that the lens surfaces are such that the resultant unwanted astigmatism of the lens is reduced. The patent provides

a clear and sufficient teaching. In particular, the patent specification contains specific examples in which the astigmatism is corrected as shown in the tables. Therefore, the skilled person has no difficulty in achieving a lens having misaligned areas of unwanted astigmatism as claimed. Objections of lack of clarity do not constitute an opposition ground.

Document P1 is silent as to the astigmatism distribution in the lens surfaces; in particular, there is no disclosure that the embodiment of Figure 9 would lead to different astigmatism distributions on the surfaces of the lens. Figures 2 and 5 rather point away from such a possibility.

The simulations of the lens of the example of document P1 carried out by the opponent are based on a selection of a particular lens surface and constitute a reconstruction *a posteriori* because document P1 fails to disclose the equations of the lens surfaces. In addition, the Annex K shows a simulation of the lens of the example of document P1 in which the areas of unwanted astigmatism are not misaligned.

The opponent's submissions on the theorem of Minkwitz presuppose a linear increase of the spherical add power effect along the meridian of umbilical progression and this hypothesis does not apply to progressive lenses in which the progression of add power is not linear but close to the function arc tangent. In addition, a linear add power progression exhibits a discontinuity in the derivative at the zero dioptric add power and at the nominal prescription add power points. The progressive lenses of document P1 have a non-linear add

power profile, and the considerations of the opponent are therefore not applicable to these lenses.

The standard ISO 8980-2 only relates to the manufacturing tolerances in a finished lens with respect to the nominal prescription of the wearer; in addition, the document refers to lenses having only one progressive surface. The document refers to the total tolerances of the lens, and not to the relative tolerances of the lens surfaces or to the tolerance in the relative position of the two lens surfaces. The invention expressly involves the misalignment of unwanted astigmatism and the tolerances in the manufacturing deviations mentioned in document P18 do not qualify as the solution to a technical problem, the document being silent as to the correction of astigmatism.

Document P2 merely discloses the possibility of having two different lens surfaces and fails to disclose examples and the shape of the lens surfaces. Therefore, there is no proof that the resulting lens will necessarily have different astigmatism distributions on the two lens surfaces.

Document P3 discloses a lens having aspheric surfaces and an optical power gradually increasing along the vertical meridian plane but fails to disclose two progressive lens surfaces in the sense of the claimed invention. The document proposes the incorporation of correction of the wearer's astigmatism by the addition of a cylinder, and is silent as to any correction of the unwanted astigmatism of the lens itself.

The closest prior art is document P1. Document P3 is not appropriate as closest prior art because the document is not related to progressive lenses of the type considered in the patent; there is no connection between document P3 and the problem addressed in the patent specification, as shown by the discussion of document P3 in document P2' which goes in a quite different direction.

There is no suggestion in the prior art towards shifting the maxima of unwanted astigmatism as claimed. Document P6 is limited to the design of one single progressive lens surface by combining two different surface designs and, in addition, fails to specify any relationship between the two lens surfaces and any improvement of the properties of the resulting lens.

VII. The arguments submitted by the opponent in support of its requests and pertinent for the present decision are essentially the following:

During the first-instance proceedings the patent proprietor made no request for maintenance of the patent as granted or as amended according to the main or the auxiliary request No. 1 submitted with its statement of grounds of appeal; consequently, as far as the mentioned main and auxiliary request No. 1 are concerned, the patent proprietor was not adversely affected by the decision under appeal within the meaning of Article 107 EPC 1973. In addition, there is no justifiable reason for the late submission of the mentioned amended requests (decisions T 528/93, T 840/93, and T 54/00). Consequently, the appeal filed by the patent proprietor is not admissible as far as

the main and auxiliary No. 1 request filed with the statement of grounds of appeal are concerned. The same applies with regard to the present request of the patent proprietor. This request was filed during the oral proceedings and only involves slight amendments made to the independent claims as granted in view of document P3, a document which was already extensively discussed during the proceedings; the present request was therefore filed too late and is not admissible.

There is no basis in the application as filed for the term "about" in the independent claims of the present request and already present in the independent claims as granted (Article 100(c) EPC 1973). In particular, the dioptric add power of the lens is disclosed in the application as filed, and in particular on page 3, lines 18 and 19, and 25 and 26, page 4, lines 52 and 53, and page 6, lines 7 to 9, in table 1 and in claims 1 and 10 of the publication of the application, as an exact sum of the add powers of the two surfaces.

The patent specification, and in particular paragraph [0020], fails to define what is specifically meant by "areas of maximum, localized unwanted astigmatism"; the description refers to both "areas" and "locations" (paragraphs [0020], [0038], [0040], [0043]), and in the particular case in which the maximum of astigmatism is reached at a point, the "areas" and more particularly their extension are unclear. In addition, the question of whether the areas of maximum unwanted astigmatism are misaligned or not depends on the level of measurable astigmatism and also on the misalignment

criteria; however, neither the method of measurement of the astigmatism, nor the degree of precision in the measurement, nor the degree of misalignment required by the invention are specified in the patent specification, nor is there a standard for the measurement precision. More particularly, the definitions in the description (paragraphs [0020] and [0023]) are also indeterminate, the examples do not specify the topology of the lens surfaces, the representations in the figures are oversimplified, particular measures such as the linear displacements and/or rotations of the surfaces are not sufficient for all possible topologies because such measures could even increase the unwanted astigmatism of the lens, and the mismatch between the directions of the astigmatic vectors of the surfaces (paragraph [0028]) is not possible if the surfaces are not known. As a consequence, the maxima of unwanted astigmatism of a given lens may be misaligned or not depending on features not defined in the patent and that the skilled person would have to select, thus calling for "arbitrary choices" by the skilled person within the meaning of decision T 252/02 (point 2.2.1) with the consequence that the skilled person would not know whether a lens will fall within the terms of the claim. Therefore, the patent specification fails to specify all the information enabling the skilled person to obtain lenses according to the claimed invention.

The lens disclosed in the third embodiment described in document P1 has two progressive lens surfaces each having a different dioptric add power. Claim 1 does not require any minimum value of the misalignment of the areas of maximum unwanted astigmatism, and the patent

specification specifies misalignments (page 4, lines 2, 3 and 15) that are within the unavoidable manufacturing deviations. In particular, the ISO standard 8980-2 (document P18) defines deviation tolerances in the manufacture of progressive lenses having a predetermined prescription (Tables 2 and 4) and these tolerances can also be understood as the order of tolerance in the relative rotation and the relative linear displacement of the two lens surfaces of a double progressive lens; although the mentioned ISO standard relates to single progressive lenses, it also applies to double progressive lenses since the tolerances for each surface would be statistically added. Therefore, in view of the manufacturing tolerances given in document P18, the unavoidable manufacturing deviations in the relative position of the two lens surfaces and in the shape of each of the surfaces are such that the fabrication of the progressive lens of document P1 will inevitably result in lenses having misaligned areas of maximum unwanted astigmatism as claimed. As a matter of fact, it is difficult to design and then manufacture a lens that does not fall within claim 1.

Alternatively, the add power of the lens of document P1 is not uniformly distributed on its two surfaces, so that the optical power distribution and thus the shape of the two progressive surfaces is different, and this necessarily implies a different position of the maxima of unwanted astigmatism. This is also implied by the theorem of Minkwitz shown in documents P7 to P10. According to this theorem, the variation of astigmatism perpendicularly to the umbilical line is proportional to the variation of the spherical surface refractive

value along the umbilical line; assuming a linear variation in the spherical effect at the umbilical point line, it follows from this theorem that the variation of the astigmatism in the direction orthogonal to the umbilical line is proportional to the add power. Therefore, in the case of the lens of document P1 having surfaces with different add powers and an umbilical line 14 the distribution of the astigmatism and therefore that of the maxima of astigmatism cannot coincide and must be misaligned.

In addition, the simulation of the lens of the third example of document P1 also shows that the areas of maximum astigmatism of the lens surfaces are misaligned. Also the simulation of the lens carried out by the patent proprietor shows misaligned local maxima of astigmatism in the far vision zone, claim 1 only requiring that a portion of the maxima of astigmatism is misaligned.

Document P2 discloses a lens with two progressive lens surfaces, a first surface with an umbilical point line as principal meridian and a second surface with a principal meridian having astigmatism, i.e. not constituting an umbilical line. Two such progressive surfaces necessarily have a different distribution of astigmatism and therefore misaligned maxima of unwanted astigmatism as claimed.

The two aspheric progressive surfaces of the lens disclosed in document P3 (claims 1 and 3, page 2, lines 92 to 124, and Figures 1 and 2) have a gradually changing power having an add power in the lower direction and the lens is also functionally a

progressive lens for far and near vision. In addition, the two surfaces of the lens necessarily have different astigmatism distributions and the document discloses the displacement and the rotation of the lens surfaces with respect to each other. Accordingly, either the initial lens or the lens obtained by displacing or rotating relatively the two lens surfaces will satisfy the claimed misalignment condition.

Alternatively, the fabrication of the progressive lenses of any of documents P2 and P3 will, in view of the manufacturing tolerances already mentioned, necessarily and unavoidably also lead to lenses having misaligned areas of maximum astigmatism.

As regards the issue of inventive step, the correction of unwanted astigmatism depends on the shape of the lens surfaces, on the specific astigmatism distribution, etc., and the mere displacement of astigmatism distributions proposed in the patent is not sufficient in general to correct unwanted astigmatism. Claim 1 therefore encompasses embodiments having no technical effect and resulting from mere manufacturing deviations. Thus, there is no objective technical problem solved by the claimed invention.

Document P3 qualifies as closest state of the art. The fact that the document is cited in document P2 shows that its disclosure was considered relevant in this art. Assuming that the continuous progressive power regions of the lens of document P3 are not sufficient to anticipate the claimed lens, it is straightforward to incorporate in the lens the near and far vision zones that became conventional in the subsequent years

in order to improve the far/near vision of the wearer. The simple idea of incorporating such vision zones in the lens of document P3 cannot amount to an inventive step.

Document P2 discloses a different design for each of the two surfaces of a lens, and documents P4 and P5 disclose lenses having two progressive surfaces, and the problem is to reduce the unwanted astigmatism. In addition, document P6 teaches the linear combination of two progressive surfaces with a different design and therefore with different astigmatism distributions, the combination resulting in an improved distribution of astigmatism and a decrease in the maximum astigmatism values. Since according to the common general knowledge the effect of a double progressive lens is the sum of effects of the first and the second lens surfaces, the skilled person would consider the application of the teaching of document P6 to a lens as that disclosed in document P2 or in any of documents P4 and P5, and thus readily arrive at the claimed subject-matter.

All the submissions apply *mutatis mutandis* to the process claim.

Reasons for the Decision

1. *Admissibility of the appeals*

1.1 The appeal of the opponent is admissible.

1.2 As regards the appeal of the patent proprietor, the opponent submitted that the subject-matter of the claims amended according to the main and auxiliary request No. 1 filed by the patent proprietor with its statement setting out the grounds of appeal was broader than that of the claims of the requests defended by the patent proprietor during the first-instance proceedings, and that consequently, as far as the mentioned main and auxiliary request No. 1 were concerned, the appeal was not admissible because the patent proprietor was not adversely affected by the decision under appeal within the meaning of Article 107 EPC 1973.

However, as already noted by the Board on a preliminary basis in the annex to the summons to oral proceedings, the opponent did not contest the admissibility of the appeal of the patent proprietor with respect to the claims amended according to the remaining auxiliary requests No. 2 to 13 also filed with the statement of grounds of appeal, and during the oral proceedings the opponent did not dispute this finding of the Board. In addition, no other issue appears to call into question the admissibility of the appeal of the patent proprietor.

Accordingly, irrespective of the admissibility into the proceedings of the main and auxiliary request No. 1 filed with the grounds of appeal, the admissibility requirements concerning the appeal filed by the patent proprietor were met at the time of filing the statement of grounds of appeal at least as far as the auxiliary requests No. 2 to 13 were concerned. As a consequence, the appeal of the patent proprietor is admissible. It is noted in this respect that an appeal can only be

assessed as a whole (decision T 382/96, point 1 of the reasons) and that there is no support in the EPC for a notion of "partial admissibility" of an appeal (decision T 774/97, point 1.1 *in fine*); thus, if the admissibility requirements, and in particular those of Article 107 EPC 1973, are fulfilled at least in respect of one request, let alone of several request as is the case of auxiliary requests No. 2 to 13, the appeal as a whole is admissible. In addition, the present main and sole request filed during the oral proceedings was admitted into the proceedings (see point 2 below), also meeting the requirements of Article 107 EPC 1973.

The Board concludes that the appeal filed by the patent proprietor is admissible.

2. *Admissibility of the main request into the proceedings*

The claims amended according to the present and sole main request of the patent proprietor were submitted during the oral proceedings held before the Board. The opponent objected to the admissibility of the amended set of claims on the grounds that the amendments were filed too late without justifiable reason and also on the same grounds submitted against the admissibility of the main and auxiliary request No. 1 filed by the patent proprietor with its statement of grounds of appeal, i.e. the lack of an adverse effect (see point VII above, second paragraph).

During the first-instance proceedings the patent proprietor repeatedly amended the claims as granted in an attempt to overcome the different grounds for opposition and also the different objections raised by

the opponent and the opposition division with regard to specific technical features of the claims, and the interlocutory decision under appeal was then based on a main and three auxiliary requests containing different amended versions of the independent claims as granted. In addition, as noted in decision T 168/99 (point 1 of the reasons) cited by the patent proprietor, withdrawal of subject-matter does not necessarily mean that it has formally been abandoned. The basis for determining the presence of an adverse effect within the meaning of Article 107 EPC 1973 are therefore the claims as granted. In the circumstances of the present case, the Board does not see any reason for not allowing during the present appeal proceedings a claim request containing independent claims consisting of the independent claims as granted amended as to clarify the meaning of a claimed technical feature; in particular, the fact that the subject-matter of these amended independent claims is broader than that of the claims of the amended requests considered during the first-instance proceedings does not constitute, in the absence of any special circumstance such as a possible abuse of procedure, a sufficient reason for not admitting the present main and sole request into the appeal proceedings. The patent proprietor is adversely affected because it has not abandoned any subject-matter of the claims as granted.

As regards the decisions T 528/93, T 840/93 (OJ EPO 1996, 335) and T 54/00 cited by the opponent in support of its submissions, during the oral proceedings the opponent did not dispute the preliminary opinion expressed by the Board in the summons to oral proceedings that the particular circumstances

underlying these decisions were not comparable to those of the present case. In particular, decision T 54/00 concerned a case in which the decision under appeal allowed the main request of the patent proprietor and the appeal was considered inadmissible (point 3.1 of the reasons), decision T 840/93 concerned a case in which, in view of still pending divisional applications, the corresponding Board refused to admit an amended claim request filed during the appeal proceedings and raising new issues not considered previously by the opposition division (point 3 of the reasons), and decision T 528/93 concerned a case in which the corresponding Board, in exercising its discretion, decided not to admit on appeal an amended claim request first submitted and then withdrawn during the first-instance oral proceedings (point 1 of the reasons) (see also comments in decision T 386/04, point 1 of the reasons).

The further submission of the opponent that the amended claim request was filed too late and without justifiable reason does not prejudice in the opinion of the Board the admissibility of the amended claim request because, as submitted by the patent proprietor, the amendments only concern the clarification of a technical feature of the independent claims and, in addition, the amendment did not raise new issues and did not affect the nature of the technical issues under consideration.

In view of the above, during the oral proceedings the Board, in exercising its discretion under Articles 13(1) and (3) RPBA (Rules of Procedure of the Boards of Appeal), decided to admit into the

proceedings the present amended main request of the patent proprietor.

3. *Amendments*

3.1 The opponent has contested the finding of the opposition division that the term "about" in the expression "about the sum of the first and second dioptric add powers" in independent claims 1 and 10 as granted does not constitute added subject-matter, the objected feature also being present in independent claims 1 and 5 amended according to the present request. According to the opponent, the application as originally filed would only support the exact sum of the first and second dioptric add powers.

However, as submitted by the patent proprietor, paragraph [0032] of the publication of the application as filed specifies that the sum of the dioptric add powers of the two lens surfaces "is substantially equal to" the value required to correct the lens wearer's near vision acuity. Moreover, although in the passages of the application as filed identified by the opponent (point VII above, third paragraph) the total add power of the lens is said to be the sum of the add powers of the surfaces of the lens, none of the passages requires that the sum is the exact sum and, in addition, in some of the examples of the lenses of the invention, and in particular in those listed in Tables 2 and 3 of the publication of the application as filed, the sum of the dioptric add powers of the lens surfaces is of 2 dioptres, whereas the total dioptric add power of the corresponding lens is, depending on the example, of 1.85, 1.90, 1.95 or 2.10 dioptres, i.e. a value that is

close to, but not exactly equal to the sum of the dioptric add powers of the respective lens surfaces.

It follows from the aforementioned passages in the application as filed that the skilled reader would understand that the total dioptric add power of the lens will generally be equal to "about", but not necessarily exactly equal to the sum of the dioptric add powers of the surfaces of the lens.

In addition, the opponent has submitted no counterargument in response to the finding of the opposition division in the decision under appeal that it is clear to the skilled reader that the total add power of a lens cannot be the exact sum of the add powers of its surfaces in view of the "lens maker's formula" and the non-uniform thickness of the lens.

In view of the understanding of the disclosure of the application as filed by a skilled reader, no added subject-matter within the meaning of Article 100(c) EPC 1973 can be seen in the introduction of the expression "about" in the claimed feature under consideration.

3.2 The opponent did not dispute that the patent documents amended according to the present request comply with the formal requirements of the EPC, and in particular with those set forth in Articles 123(2) and (3) and Rule 80 EPC, and the Board is satisfied that this is the case. In particular,

- independent claims 1 and 5 of the present request correspond to independent claims 1 and 10 as granted, respectively, amended so as to specify the

meaning of the expression "progressive addition surface" as defined in paragraph [0020] of the publication of the application as filed,

- dependent claims 2 to 4 correspond to dependent claims 6, 8 and 9 as granted,

- dependent claims 2 to 5, 7 and 11 to 13 as granted have been deleted, among other reasons, in reply to grounds for opposition raised with regard to the technical meaning of some features specified in the deleted claims ("optical centers" of progressive surfaces and "channel length" of progressive surface channels), and

- the description and the drawings according to the present request are the same as those of the patent specification as granted.

4. *Sufficiency of disclosure*

4.1 The claimed invention is directed to a lens having two progressive addition surfaces. It is common ground that each of such surfaces has an unavoidable, locally varying astigmatism, especially on either side of the progressive channel joining the far and near vision zones, and that the astigmatism of each of the surfaces contributes to the total unwanted astigmatism of the lens. The primary problem addressed in the patent is the reduction of the total unwanted astigmatism of the lens, and according to the invention defined in each of independent claims 1 and 5 the problem is solved by disposing the progressive addition surfaces with respect to each other so that "a portion or all areas of maximum, localized unwanted astigmatism are misaligned".

4.2 In support of the grounds for opposition under Article 100(b) EPC 1973, the opponent has essentially submitted that the "areas of maximum, localized unwanted astigmatism" of the lens surfaces are unclear and indeterminate in the claimed invention, and that the degree of misalignment of the areas is also indeterminate. It should be noted, however, that the objections raised by the opponent relate to features already present in independent claims 1 and 10 as granted and that the requirements of Article 84 EPC 1973 do not constitute grounds for opposition under Article 100 EPC 1973, so that the objections raised are pertinent for the opposition ground under Article 100(b) EPC 1973 only as far as they may have an impact on the question of whether the patent discloses the claimed invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

As submitted by the patent proprietor, there are several techniques known in the art for determining the astigmatism distribution of a given progressive addition surface, and there is no evidence or technical argument on file that the different techniques and the corresponding measurement precisions would give results differing substantially from each other to the extent of disabling the skilled person to carry out the claimed invention in which not the absolute values, but only the relative characteristics of the surface astigmatism distributions are relevant (see in this respect decision T 378/97, point 2.4.1 of the reasons). In addition, the skilled person would not have difficulties in identifying the points of maximum localized unwanted astigmatism in the astigmatism

distributions so obtained; as a matter of fact, the opponent did not report any difficulty in determining the astigmatism distributions and in identifying the points of maximum astigmatism in the surfaces of a lens according to a simulation carried out by the opponent itself on the basis of the disclosure of document P1 (document P24).

According to the claimed invention, the two progressive addition surfaces are disposed relative to each other so that "a portion or all areas of maximum, localized unwanted astigmatism are misaligned". Although the patent specification fails to specify in absolute terms the extension of the areas around the points of maximum, localized unwanted astigmatism and also the degree of misalignment of the areas (paragraphs [0020] and [0023]), according to the proper disclosure of the invention the progressive surfaces should be disposed relative to each other so that the regions around the points of maximum, localized unwanted astigmatism on both surfaces of the lens do not substantially coincide and are sufficiently misaligned at least to an extent such that the resultant total maximum, localized astigmatism of the lens is less than the sum of the individual maximum, localized astigmatism contributions of the surfaces (page 3, lines 5 to 10 and paragraphs [0023] and [0028]). In addition, the patent specification discloses different technical measures for relatively disposing the lens surfaces so as to implement the claimed misalignment condition (linearly displacing and/or rotating one surface with respect to the other or endowing the progressive surfaces with different channel lengths, see

paragraphs [0028] and [0029] of the patent specification) and the patent specification also contains several specific examples illustrating the implementation of such measures (Examples 1 to 10 on pages 4 to 6 and the figures) and in which the reduction of the total astigmatism of the lens is achieved (Tables 1 to 3). The fact that the different examples do not specify the particular shape of the lens surfaces is not detrimental to sufficiency of disclosure because depending on the particular progressive surface the skilled person is in a position to select the appropriate technical measure from among those taught in the patent specification.

Therefore, the skilled person would identify in the disclosure of the patent specification a clear and sufficient technical teaching to the effect that the spatial extension of the areas to be considered and the degree of misalignment of these areas should be such as to guarantee that the resulting total localized unwanted astigmatism of the whole lens is lower than in the case in which there is substantial alignment between the points of maximum unwanted astigmatism in both surfaces. In this regard, the skilled person might benefit, when putting into practice the claimed invention, from a certain degree of freedom in the selection of the spatial extension of the areas and the degree of alignment of the areas, but would not be facing the need of making objectionable "arbitrary choices" within the meaning of decision T 252/02 (point 2.2.1 of the reasons) as objected by the opponent because, contrary to the present case, in the circumstances considered in the cited decision the implementation of the invention depended crucially on

the specific values of two parameters and there was insufficient information as to how these two parameters were to be measured, with the consequence that, in view of the arbitrary choices that the skilled person would have to make in order to measure the parameters and the different results that he would obtain, the skilled person was not in a position to establish whether the values of the parameters could be effectively correlated to the limits of the values required by the claimed invention (points 2.2.1, 2.2.2 and 2.2.5 of the grounds).

4.3 The opponent has also submitted that, as a consequence of the indeterminate extension of the areas and the unspecified degree of misalignment between the areas, the skilled person would not know "whether he is working within the area covered by the claim" in the sense of decision T 252/02 already mentioned (point 2.2.1 of the reasons). However, the question addressed by the opponent pertains by its very nature to the assessment of the requirements set forth in Article 84 EPC 1973 and, as noted in decision T 608/07 (point 2.5.2 of the reasons), for an insufficiency arising out of a deficiency as that alleged by the opponent "it will normally be necessary to show that [the alleged deficiency] deprives the person skilled in the art of the promise of the invention". However, as already concluded in point 4.2 above, in the circumstances of the present case no undue burden would be placed on the skilled person wishing to perform the claimed invention and to achieve the corresponding technical effects.

4.4 In view of the above considerations, the Board concludes that the disclosure of the invention is sufficiently clear and complete for a skilled person to be able to design and combine two progressive surfaces so as to carry out the claimed invention without undue burden (Article 100(b) EPC 1973).

5. *Claim 1 - Novelty*

The opponent has based its objection of lack of novelty on the lenses disclosed in documents P1, P2 and P3. During the proceedings it has been undisputed that a progressive surface exhibits inherently and unavoidably unwanted astigmatism and that any lens satisfies the claimed condition that the total add power of the lens is about the sum of the add powers, if any, of the surfaces. Therefore, the issue of novelty boils down to the question of whether the lenses of documents P1, P2 and P3 satisfy the remaining claimed features.

5.1 Document P1 discloses lenses having two progressive lens surfaces having a far and a near vision zone, and in the third embodiment disclosed with reference to Figure 9 the dioptric add power distribution in the two lens surfaces is different (page 12, line 53 to page 13, line 20). There is no explicit disclosure relating to the distribution of unwanted astigmatism on each of the two lens surfaces, and the opponent has submitted alternative lines of argument in support of its view that a lens according to the third embodiment of document P3 would inevitably satisfy the claimed requirement that a portion or all of the areas of maximum, unwanted astigmatism are misaligned.

5.1.1 According to a first line of argument of the opponent, the unavoidable manufacturing deviations in the production of the lens disclosed in document P1 are such that the lens would inevitably satisfy the claimed condition relating to the misalignment of unwanted astigmatism. The opponent referred in particular to the deviation tolerances according to the ISO standard 8980-2 (document P18), to the indeterminate minimum value of the misalignment of unwanted astigmatism in claim 1, and to the lower values of the misalignment resulting from the disclosure in paragraphs [0028] and [0029] of the patent specification.

Manufacturing deviations are inevitable in the manufacture of a lens according to the third embodiment of document P1. However, the misalignment condition required by claim 1 does not only involve the points of maximum astigmatism, but the areas of maximum astigmatism, and although the claim does not specify the degree of misalignment or the actual extension of the areas, the proper construction of the claimed subject-matter on the basis of the disclosure of the invention requires a degree of misalignment of the maxima of astigmatism sufficient to reduce the total unwanted astigmatism of the lens (patent specification, introducing paragraph; see also page 3, lines 7 to 10 and paragraphs [0028] and [0029]), and there is no evidence that the degree of manufacturing deviations inherent to the production of the lens of document P1 would necessarily result in such a degree of misalignment. In particular, the patent specification discloses degrees of misalignment in the unwanted astigmatism resulting from a relative linear shift of

the lens surfaces of at least 0.1 mm, a relative rotation of the lens surfaces of at least 1 degree, and a channel length difference between the lens surfaces of at least 0.1 mm (paragraphs [0028] and [0029]), and there is no evidence that the unavoidable deviations in the manufacture of the lens of document P1 would necessarily reach the minimum values mentioned above.

More particularly, the ISO standard 8980-2 referred to by the opponent and shown in document P18 does not allow a different conclusion. Firstly, the mentioned standard relates to progressive lenses having only one progressive lens surface, and contrary to the opponent's submissions the considerations and assumptions underlying the different parameters and measurements considered in the standard cannot be straightforwardly applied to double progressive lenses. Secondly, the standard establishes the maximum permissible tolerances in the manufacturing deviations of the optical parameters of the whole lens from the corresponding nominal values (for instance, a tolerance of 7° on the direction of the cylindrical axis and a horizontal tolerance of 1 mm and a vertical tolerance of 0.5 mm on the optical centration and prismatic power of the lens, see Tables 2 and 4), but is silent as to the allowable tolerances in the deviation of the optical parameters of one of the lens surfaces with respect to the other one of the surfaces. And thirdly, the maximum permissible tolerances in the manufacturing deviations allowed by a standard as that disclosed in document P18 do not constitute, in the absence of any appropriate indication, a positive, objective technical disclosure to the effect of deliberately and purposely reaching during manufacture the maximum allowable

tolerance values; in particular, document P18 fails to disclose any correlation between the possible manufacturing deviations from the nominal values and any positive technical effect.

5.1.2 In a second line of argument the opponent has submitted that the surfaces of the lens of the third embodiment of document P1 have different add powers and therefore a different shape and that as a consequence the distribution of unwanted astigmatism in each of the lens surfaces will necessarily satisfy the claimed misalignment requirement. However, the mere fact that two progressive lens surfaces have a different shape does not necessarily imply that the distribution of the unwanted astigmatism on the two surfaces is different, not at least to the extent required by the claimed subject-matter.

In support of its submissions the opponent has referred to the application of the theorem of Minkwitz to the lens of document P1. This theorem relates the derivative of the surface astigmatism in the direction perpendicular to the umbilical line of a progressive surface to the derivative of the surface power along the umbilical line (document P7, page 226, lines 9 to 14, document P8, page 235, first column, line 24 to page 235, second column, line 18, document P9, page 222, first column to page 223, first column, and document P10, page 187, second column, line 23 to page 189, first column, line 16), and according to the opponent this theorem would imply that the variation of astigmatism in the direction orthogonal to the umbilical line depends on the add power. However, as noted by the patent proprietor, the

submissions of the opponent are based on the assumption that the spherical dioptric effect at the umbilical point line varies linearly, and this assumption is not generally valid in the case of the lenses of document P1 in which there is a gradual, non-linear change of refractive index (page 2, lines 19 to 21). In addition, as noted during the oral proceedings, the theorem of Minkwitz only concerns the value of the first-order derivative of the astigmatism in the direction perpendicular to the umbilical line and is silent as to the derivatives of a higher order, so that the submissions of the opponent are, in the absence of information on the higher-order derivatives of the astigmatism, insufficient to conclude that the areas of maximum astigmatism of the two surfaces of the lens of document P1 would necessarily be misaligned.

5.1.3 A third line of argument of the opponent relies on the results of a simulation carried out by the opponent on the basis of the optical data of the third embodiment of document P1. According to the results presented by the opponent (Figures 4 and 7 of document P24), the regions of maximum astigmatism of the two lens surfaces are substantially misaligned. In reply, the patent proprietor submitted the results of another simulation based on the same optical data and showing a substantial alignment of the regions of maximum astigmatism of the lens surfaces, especially of those in the sectors on either side of the near vision zone of the lens (Annex K).

However, as acknowledged by the parties and in particular by the opponent during the oral proceedings, the disclosure of the third embodiment of document P1

specifies different optical parameters of the lens but fails to specify the specific shape of the lens surfaces, so that the simulations carried out by both parties are necessarily based on the selection of particular lens surface shapes presumably satisfying the optical parameters disclosed in document P1. Since the levels of astigmatism of a lens and more specifically its distribution on the lens surfaces depends critically on the shape of the surfaces, it follows that the simulations carried out by the parties are not necessarily representative of the astigmatism of the lens (or rather the family of lenses) disclosed in the third embodiment of document P1. Consequently, the results of the simulations do not constitute conclusive evidence as to whether or not the lens disclosed in the third embodiment of document P1 would inherently satisfy the claimed misalignment condition.

5.2 Document P2 (see also the corresponding patent P2') discloses progressive lenses with aspheric surfaces (title). The document also proposes to shape both surfaces of the lens as progressive surfaces (abstract and page 19, last paragraph), one of the surfaces having an umbilical point line as principal meridian and the other one having a principal meridian with a specific astigmatism (page 20, first paragraph).

According to the opponent two lens surfaces having the characteristics mentioned above will necessarily satisfy the claimed condition relating to the misaligned astigmatism. However, there is no evidence or technical argument that the astigmatism distributions of a lens surface having an umbilical point line as principal meridian and of a lens surface

having a principal meridian with a specific astigmatism would necessarily be such that the maxima of localized unwanted astigmatism would be relatively misaligned as required by the claimed subject-matter. Therefore, the disclosure of document P2' is insufficient to support the opponent's submissions in this respect.

The further submission of the opponent that the manufacture of the lens disclosed in document P2 would necessarily result, in view of the manufacturing tolerances given in document P18, in a lens satisfying the mentioned claimed requirement is not considered persuasive for reasons analogous to those already put forward in point 5.1.1 above.

5.3 Document P3 discloses a lens having two aspheric surfaces each having an increasing optical power in the vertical meridian plane towards the bottom of the lens (claim 1) and the document proposes displacing or rotating one of the lens surfaces with respect to the other in order to introduce correction of the wearer's astigmatism (page 4, lines 23 to 42).

However, although the lens disclosed in document P3 has a gradually increasing optical power and can therefore be qualified - as submitted by the opponent - as being functionally progressive and suitable for far and near vision, the document fails to disclose a lens having progressive addition surfaces as defined in claim 1 amended according to the present request; more particularly, the document fails to disclose lens surfaces each having functionally and structurally distinct and identifiable zones as claimed, i.e. a far and a near vision zone and a further zone of increasing

dioptric power connecting the far and the near vision zones.

5.4 It follows from the considerations and conclusions above that the opponent has not discharged its burden of proof that the disclosure of any of documents P1, P2 or P3 would inevitably result in a lens as defined in claim 1 (Article 54(1) EPC 1973).

6. *Claim 1 - Inventive step*

6.1 *Closest prior art*

6.1.1 The primary object addressed in the patent concerns the reduction of unwanted astigmatism in lenses having two progressive lens surfaces each being a progressive addition surface having a far and a near vision zone and a zone of increasing dioptric power connecting the far and the near vision zones (claim 1 and paragraphs [0001], [0017] and [0019] of the patent specification).

Each of documents P1 (point 5.1 above), P2 (point 5.2 above), P4 and P5 (claim 2 and paragraphs bridging pages 6 and 7) discloses progressive lenses having the features mentioned above, it being common ground that the dioptric add power of the lenses is about the sum of the add powers of the lens surfaces and that the skilled person would unavoidably be confronted with the unwanted astigmatism inherently present in such lenses. Therefore, each of documents P1, P2, P4 and P5 qualifies as closest state of the art for the assessment of inventive step.

6.1.2 The opponent has submitted that the lens disclosed in document P3 qualifies as closest state of the art. However, as already concluded in point 5.3 above, the lens disclosed in document P3 is not endowed with progressive addition surfaces of the kind required by the claimed subject-matter and considered in the patent specification, i.e. the document does not address the primary object considered in the patent in suit and identified in point 6.1.1 above. In addition, document P3 teaches linearly displacing or rotating one surface of the lens with respect to the other surface for the purpose of introducing in the lens a correction of the astigmatism of the wearer (page 4, lines 23 to 42) and, although the displacement and rotation operations taught in document P3 would - as submitted by the opponent - inevitably have an effect on the alignment of the distribution of unwanted astigmatism of the lens surfaces, there is no disclosure in the document as to any impact of the measures taught in the document on the total unwanted astigmatism of the lens itself.

The further submissions of the opponent that document P3 published in 1957 was considered as a relevant disclosure in the art as shown by the reference in documents P2, P4 and P5 to document P3 and that it would be obvious to incorporate in the lens of document P3 the far and near vision zones of progressive addition surfaces developed later on do not affect the considerations set out above. Each of documents P2 (paragraphs bridging pages 7 and 8), P4 (paragraphs bridging 5 and 6) and P5 (paragraphs bridging 5 and 6) cites document P3 as teaching the provision of aspheric surfaces on both sides of a lens and none of them refers to document P3 as providing a useful teaching

that might be applicable to lenses having progressive addition surfaces with far and near vision zones and/or applicable to the correction of the unwanted astigmatism of a lens. In addition, none of the documents draws attention to the disclosure in document P3 relating to the linear displacement and the rotation of one of the lens surfaces with respect to the other.

Having regard to the above, only hindsight knowledge of the claimed invention would suggest the disclosure of document P3 as a promising starting point for the achievement of the primary object considered in the patent, and consequently document P3 does not qualify as closest state of the art in a realistic and objective assessment of inventive step of the claimed invention according to the problem-solution approach.

6.2 *Objective technical problem*

The subject-matter of claim 1 differs from the closest state of the art represented by a lens as that disclosed in any of documents P1, P2, P4 or P5 (see point 6.1.1 above, second paragraph) in that the progressive addition surfaces are disposed in relation to each other so that a portion or all areas of maximum, localized unwanted astigmatism are misaligned.

According to the patent specification (paragraphs [0017] and [0019] and the examples), the technical effect of the distinguishing feature identified above is the reduction of the total maximum, localized unwanted astigmatism of the lens.

The Board agrees with the opponent that the correction of astigmatism depends on the particular shape and the specific astigmatism distribution of the surfaces of the lens. However, in view of the disclosure of the invention (see point 4.2 above), the misalignment of at least a portion of the areas of maximum, localized unwanted astigmatism on the two lens surfaces generally reduces the resultant total maximum, localized unwanted astigmatism of the lens and therefore, contrary to the view expressed by the opponent, the Board is satisfied that the technical effect mentioned above is generally achieved by the claimed subject-matter.

Therefore, the objective technical problem solved by the claimed invention can be seen in the reduction of the total maximum, localized unwanted astigmatism of the lens.

6.3 *Obviousness*

None of the documents considered during the proceedings discloses or suggests the claimed solution to the objective problem formulated above. In particular, document P6 discloses the design of one of the surfaces of a progressive lens as a combination of two different known designs, namely a "hard" and a "soft" lens surface design (paragraphs bridging columns 2 and 3), and discusses the effect of the combined design on the astigmatism of the resulting lens (see example 1), but is silent as to endowing the other one of the surfaces of the lens with a predetermined surface design or with predetermined optical characteristics; therefore, no teaching can be inferred from this document towards any specific relationship between the surface designs of

the two surfaces of a same lens or between the respective surface astigmatism distributions, let alone towards a possible effect of such a relationship on the total astigmatism of the lens. Document P3 does not relate to lenses having progressive addition surfaces as claimed (see point 5.3 above) and, in addition, the document addresses the problem of the astigmatism of the lens and also the introduction of correction of the wearer's astigmatism (page 4, lines 23 to 42), but the document fails to provide any express teaching directed to the correction of the astigmatism of the lens itself which would have suggested the claimed solution (see point 6.1.2 above). In these circumstances, no reason can be seen why the skilled person would have considered, without the previous knowledge of the claimed invention, the application of particular teachings disclosed in document P3 or P6 to a lens as that disclosed in any of documents P1, P2, P4 and P5 so as to arrive at the claimed subject-matter.

It follows from the above that the subject-matter of claim 1 is not obvious within the meaning of Article 56 EPC 1973 over the prior art considered by the opponent.

7. *Claims 2 to 5 - Novelty and inventive step*

Independent claim 5 is directed to a process for producing a lens and the steps of the method are essentially in one-to-one correspondence with the structural and functional features of the lens defined in claim 1. In addition, the opponent has not made any specific submission with regard to this claim other than those made in connection with claim 1. It follows

that the subject-matter of independent claim 5 is novel and involves an inventive step for reasons analogous to those set forth in points 5 and 6 above with regard to the subject-matter of claim 1. The same conclusion applies to dependent claims 2 to 4 all referring back to claim 1 by virtue of their dependence on claim 1.

8. The opponent offered as evidence in support of its submissions on the issue of the evaluation of the effect of manufacturing tolerances on the lenses disclosed in each of documents P1, P2 and P3 the appointment of an expert to give an expert's opinion ("Sachverständigengutachten") under Article 117 (1)(e) EPC. The Board, however, did not see in the circumstances of the present case, and more specifically in the technical issue referred to by the opponent, any reason for following the offer made by the opponent in this respect. In particular, the Board considered itself in a position to assess all the relevant technical issues without technical assistance.

The patent proprietor for its part declared that B. Maitenaz and C. W. Fowler, authors of the declarations shown in Annex A1 and A2, were available for any means under Article 117 EPC that the Board might judge to be useful, and in particular for the assessment of the "areas of maximum, localized unwanted astigmatism" referred to in the claims. The Board, however, did not see any reason for having recourse to the means of Article 117(1) EPC in this respect, and in particular for hearing the persons named by the patent proprietor because, again, it considered itself to be in a position to assess all the relevant technical issues without technical assistance. In addition, as

already noted by the Board in the annex to the summons to oral proceedings, the contents of the declarations shown in Annex A1 and A2 were not decisive for the assessment of the present case.

9. In view of the above conclusions and considerations, the Board concluded during the oral proceedings that the patent amended according to the main and sole request and the invention to which it relates met the requirements of the EPC and that consequently the patent was to be maintained as amended by the respondent according to the present 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 with the order to maintain the patent as amended in the following version:
   - description: pages 2 to 6 of the patent specification,
   - claims: No. 1 to 5 according to the main request filed in the oral proceedings of 15 September 2009, and
   - drawings: pages 10 to 12 of the patent specification (Figures 1a to 5d).

The Registrar: The Chairman:

M. Kiehl A. G. Klein