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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

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File Number: T 559/89 - 3.4.2

Application No.: 85 201 080.0

Publication No.: 0 169 599

Title of invention: Trifocal eye-contactlens

Classification: G02C 7/04

D E C I S I O N
of 5 June 1991

Applicant: Visser contactlenzenpraktijk b.v.

Headword:

EPC Article 56 EPC

Keyword: "Inventive step (no)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 559/89 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 5 June 1991

Appellant : Visser contactlenzenpraktijk b.v.
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Decision under appeal : **Decision of Examining Division of the European Patent Office dated** 25 January 1989, written decision sent by post at 15 March 1989, **refusing European patent application No.** 85 201 080.0 **pursuant to Article 97(1) EPC.**

Composition of the Board :

Chairman : E. Turrini
Members : W.W.G. Hofmann
L.C. Mancini

Summary of Facts and Submissions

I. European patent application No. 85 201 080.0 (publication No. 0 169 599) was refused by decision of the Examining Division.

II. The reason for the refusal was that the subject-matter of the single claim submitted during the oral proceedings before the Examining Division did not involve an inventive step having regard to the following prior art document:

(D) J. Stone et al., Contact lenses, combined second edition, January 1984, Butterworths & Co (publishers) Ltd, from page 571 to page 591.

III. The Applicant (Appellant) lodged an appeal against this decision.

IV. In a communication pursuant to Art. 110(2) EPC the Board expressed its provisional opinion that the application did not appear to meet the requirements of Art. 123(2) EPC and inventive step (Art. 56 EPC).

V. Oral proceedings were held at the end of which the Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of a single claim presented at the oral proceedings.

VI. The single claim according to the Appellant's request reads as follows:

"Eye contact lens, comprising mainly concentric parts, including a central part (4) for distance or far-vision, an outer or brim-part (6) for near or reading vision and a transitional part, said parts having mutually different

focal distances, each serving to form images on the retina of the eye,

- the central part (4) having an inner concave surface and an outer convex surface,

- the brim-part (6) having an annular concave inner surface and an annular convex outer surface, the radius of curvature of the outer surface being shorter than that of the inner surface of the brim-part and having a thickness between its inner and outer surfaces, which gradually decreases towards the outer edge of the lens,

- the annular transitional part (5) being between the central part (4) and the brim-part (6), the outer and inner surfaces of which, being formed by a continuation of the outer surface of the central part and a continuation of the inner surface of the brim-part respectively, connect the outer respectively inner surfaces of both central part and brim-part to each other, having a width of between 0.3 and 0.5 mm."

VII. In support of the allowability of his request, the Appellant submitted essentially the following arguments.

The present application refers to a trifocal hard contact lens of the alternating type and solves the problem to avoid a discontinuous transition from distance vision to near vision (the discontinuity being a "jump" of the image).

Bifocal as well as trifocal lenses are known in the prior art. Attention is in particular drawn to the back surface concentric bifocal lens proposed by De Carle (see D, Fig. 19.3 on page 572), to the front surface concentric bifocal lens proposed by Wesley-Jessen (see D, Fig. 19.4

on page 572) and to the trifocal lens proposed in 1959 by Jessen, which lens is a combination of a back surface concentric bifocal according to De Carle and a front surface concentric bifocal according to Wesley-Jessen (see D, page 588). The trifocal lens of Jessen, however, was never brought onto the market for the following reason. In order to form an image, it is commonly accepted that about 70% of the surface of the pupil has to be covered by the lens. By applying this condition to the three parts of the trifocal lens of Jessen, the result is achieved that the lens must have a useful surface of 210% of the surface of the pupil and, assuming a diameter of the pupil of 4 mm, this would mean that the diameter of the lens has to be about 15 mm. A lens with such a diameter cannot fit onto the eye.

The trifocal lens of the application can be regarded as a non obvious improvement of the lens of Jessen and is based on the surprising fact that even if the intermediate part between the central part and the brim-part of the lens does not form a clear image on the retina in the sense that it is recorded by the eye independently, such a zone is nevertheless very useful to the user, because it smoothens the discontinuous transition from distance vision to near vision. This means that, according to the invention, the above mentioned 70% condition must not be satisfied in the intermediate zone, the width of which can therefore be minimized. Owing to its reduced dimensions, the lens of the application does fit onto the eye.

The prior art does not give any hint at modifying the trifocal lens of Jessen according to the invention so as to solve the mentioned problem.

Reasons for the Decision

1. The appeal is admissible.

2. Allowability of the amendments

The Board is satisfied that the amended version of the single claim, on the basis of which the Appellant requests that a patent be granted, does not contravene the requirements of Art. 123(2) EPC, since the version of this claim does not include subject-matter extending beyond the content of the application as filed.

3. Novelty

3.1 Document D discloses a back surface concentric bifocal lens of the bivision type (De Carle lens) comprising a central part for distance vision and a brim-part for near vision (see Fig. 19.3 on page 572 and the corresponding text).

D also discloses a front surface concentric bifocal lens of the alternating vision type (Wesley-Jessen lens) comprising a central part for distance vision and a brim-part for near vision (see Fig. 19.4 on page 572 and the corresponding text).

A lens is, furthermore, known from D (Jessen lens), which is a combination of a back surface concentric bifocal (De Carle lens) and a front surface concentric bifocal (Wesley-Jessen lens). By making the diameter of the distance portion on the back surface smaller than the distance portion on the front surface, a trifocal effect is achieved (see page 588, right-hand column, third paragraph).

The Jessen lens resulting from said combination is, therefore, a trifocal lens comprising concentric parts, including a central part for distance vision, a brim-part for near vision and an annular transitional part, said parts having mutually different focal distances, each serving to form images on the retina of the eye, the central part having an inner concave surface and an outer convex surface, the brim-part having an annular concave inner surface and an annular convex outer surface, the radius of curvature of the outer surface being shorter than that of the inner surface of the brim-part (this last feature derives from the fact that the brim-part is intended for near vision) and having a thickness between its inner and outer surfaces, which gradually decreases towards the outer edge of the lens, the annular transitional part being between the central part and the brim-part, the outer and inner surfaces of which, being formed by a continuation of the outer surface of the central part and a continuation of the inner surface of the brim-part respectively, connect the outer and inner surfaces of both central part and brim part to each other (this feature derives from said combination).

3.1.1 Although the De Carle lens and the Wesley-Jessen lens are explicitly mentioned to have central part diameters of 4.0 and 5.0 mm respectively (see Fig. 19.3 and page 573, left-hand column, paragraph after Fig. 19.5), thus, when combined, leading to a width of 0.5 mm of the transitional part in the Jessen lens, the Board is of the opinion that the proposal on page 588, to combine these two types of bifocal lenses, does not necessarily imply that the original diameters of the central parts should be maintained.

Thus, the subject-matter of the single claim differs from the Jessen lens known from D only in that the annular transitional part has a width (in radial direction) of between 0.3 and 0.5 mm.

3.2 Therefore, the subject-matter of the valid claim is novel in the sense of Article 54 EPC.

4. Inventive step

4.1 The present application draws attention to a typical disadvantage of the known bifocal lenses consisting in that there is a discontinuity in the transition from distance vision to near vision (see page 1, lines 17 to 20). The design of multifocal lenses, where the power of the lens gradually varies from the central part towards the edge thereof, was an attempt to overcome this disadvantage; this solution, however, entails another disadvantage, namely an optimally sharp image on the retina is never obtained (see page 1, lines 22 to 27).

It is clear that any lens having a third, intermediate part of intermediate focal length, e.g. the trifocal Jessen lens described in D, aims at reducing said discontinuity. Thus, this problem is already known and solved according to D. Moreover, it is clear that, independently of its size, such an intermediate part will produce some reduction of said discontinuity since one large step of focal distance is replaced by two smaller steps, and that the size of the intermediate part only determines the degree to which this reduction is effective.

4.2 The Board considers the trifocal Jessen lens known from D to be closest to the subject-matter of the present claim. This known lens not only reduces said discontinuity, but also has the same basic construction as the present lens (see above, item 3.1).

For the skilled person starting from this lens, there remains only to choose the relative dimensions of the three parts. In this respect, the patient's occupation and activities and the resulting visual requirements will be considered. There are, for instance, patients for whom a good distance vision is essential (for flying, driving, etc.) or a good near vision is required (for reading) or, alternatively, a good intermediate vision or a combination thereof are demanded.

If, for example, as is often the case, both a good distance and a good near vision are required for the same lens, the skilled person will know that the central part and the brim-part of the Jessen lens must produce a sharp and bright image, whereas the image deriving from the transitional part is less important. Considering that the dominance of an image depends on the dimensions of the part of the lens generating said image and that the outer diameter of the lens is determined by the cornea of the eye, it is obvious that, in the above mentioned case, the skilled person will accept a reduced width of the transitional part with respect to the other two parts, thus effectively maintaining the dimensions of the distance and near vision parts of the De Carle and the Wesley-Jessen lens as they are mentioned in D.

4.3 As mentioned above with regard to D, the Jessen trifocal lens is a combination of the De Carle and Wesley-Jessen bifocal lenses. The De Carle lens (see Fig. 19.3) shows a central distance part having a diameter of 2.0 to 4.0 mm, whereas the Wesley-Jessen lens (see page 573, left-hand column, paragraph after Fig. 19.5) originally had a 6.0 mm central distance part, which was later reduced to 5.0 mm to increase the near part.

It is reasonable to assume that the skilled person, while combining said two bifocal lenses according to the teaching of Jessen, will primarily try said known values of the diameters and would then, only if required, modify the so-dimensioned Jessen lens. By using a diameter of 4.0 mm for the central part of the De Carle lens and 5.0 mm for the central distance part of the Wesley-Jessen lens, an intermediate part is obtained in the Jessen lens having a width of 0.5 mm, which corresponds to the upper value of the claimed interval.

The document D, therefore, gives a hint at choosing values for the width of the transitional part falling within the claimed interval.

4.4 The Appellant has argued that the discontinuity reduced by the present lens is actually a "jump" of the image occuring when the junction between the distance part and the near part of the lens moves across the pupil of the eye, and that consequently the problem solved in the present case is basically different from the problem underlying known trifocal lenses. The Board cannot accept this argument because for such a "jump" to be possible the lens would have to be of the "alternating type" (where the construction of the lens is such that the lens moves considerably on the eye in order to bring different focal parts in front of the pupil; in contrast to the "bivision type" where the different focal parts are arranged to stay simultaneously in front of the pupil). However, nothing in the original application documents points to the fact that the claimed lens could be an "alternating type" lens. On the contrary, the drawings rather appear to point to a "trivision type" lens for which the problem of "jump" of the image could not arise.

4.5 The further argument of the Appellant, that a surprising effect should be seen in the fact that the transitional part smoothens the discontinuous transition from distance vision to near vision, even if said part does not form a clear image on the retina, is not convincing. There is no lower limit for the area of a focal part to form a clear image (at least as long as diffraction can be ignored) and, in the Board's opinion, the skilled person always expects that an intermediate part having an intermediate focal distance will reduce the step between near and far vision, the size of the intermediate part only determining the degree to which this reduction is effective.

4.6 The Board cannot, moreover, accept the further argument of the Appellant that there was a prejudice against accepting a relatively small width for any optical part of a contact lens since the above mentioned 70% condition (see item VII) was always met in the prior art.

It is true that in D (see page 589, left-hand column, last paragraph) it is stated that "from the author's experience, it is preferable, for good vision, for the area in front of the pupil to be at least 60% of one power so that using a combination of alternating vision and bivision, a trifocal lens should be possible in many cases, particularly if the pupil diameter is not greater than 4.0 mm". However, this single piece of text is not considered sufficient for proving a prejudice. According to said text, this condition need only be met preferably (not necessarily) and, moreover, is less restrictive than the 70% condition mentioned by the Appellant. Furthermore, this text relates to an "alternating type" lens, and the mere existence of "bivision type" lenses not relying on movement on the eye (e.g. the De Carle lens, see Fig. 19.3 of D) speaks against the strict necessity of such large areas in every case. Besides, the area of a transitional

part having a width of e.g. 0.5 mm as claimed, is by no means extremely small as compared with other parts. If a value of 4.0 mm is chosen for the diameter of the distance vision part (see point 4.3 above), the area of a 0.5 mm wide transitional part is still about 56% of that of the distance vision part.

4.7 Therefore, the Board comes to the conclusion that the claimed range of values of the width of the transitional part cannot be regarded as inventive, because it comes within the scope of the customary practice followed by a person skilled in the art and the advantages thus achieved can readily be contemplated in advance.

Thus, the subject-matter of the single claim lacks an inventive step (Art. 56 EPC) and, consequently, the claim is not patentable (Art. 52(1) EPC).

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana E. Turrini