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D E C I S I O N
of 10 May 2001

Case Number: T 0474/98 - 3.2.3

Application Number: 85 105 655.6

Publication Number: 0 160 985

IPC: B24B 9/14

Language of the proceedings: EN

Title of invention:

Method and device for calculating relationship between
pre-edged lens and spectacle lens

Patentee:

Kabushiki Kaisha TOPCON

Opponent:

I: Wernicke & Co. GmbH

II: Wernicke & Co. GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 52, 123, 56

Keyword:

"Patentable inventions - technical features (yes)"

"Amendments - Art. 123(2) and Art. 123(3)"

"Inventive step - non-obvious combination of known features"

Decisions cited:

-

Catchword:

-



Case Number: T 0474/98 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 10 May 2001

Appellant:
(Opponent II)

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Respondent:
(Proprietor of the patent)

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Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office dated 3 March 1998
concerning maintenance of European patent
No. 0 160 985 in amended form.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
C. Holtz

Summary of Facts and Submissions

- I. In the oral proceedings of 9 February 1998 the opposition division maintained European patent No. 0 160 985 in amended form i.e. on the basis of claims 1 to 4 submitted on 7 February 1995 and amended as requested during the oral proceedings held on 9 February 1998.
- II. The independent claims 1 and 3 thereof read as follows:
- "1. A method for determining whether a pre-edged lens can be edged to be fitted to a spectacle frame and for edging a lens, characterized by the following steps:
- a frame measurement step for digitally measuring respective radius vector values (ρ_n , θ_n) of vectors extending from an origin to a groove of the spectacle frame (201);
 - a lens measurement step for digitally measuring the radius (R) of the circular pre-edged lens (LE) to be measured, whereby the lens is held by a lens rotating shaft or shafts (18, 18a) so that the axis of the lens coincides with that of the shaft(s);
 - a step of converting the radius vector values (ρ_n , θ_n) into coordinate values (X_n , Y_n);
 - a step of transforming said coordinate values (X_n , Y_n) into eccentric coordinate values (X'_n , Y'_n) for compensating for an eccentricity of the geometric center (O) of the spectacle frame (201) with regard to the optical center (O') of the spectacle lens (LE), which coincides with the axis of the eye;

- a step of converting the eccentric coordinate values ($X'n$, $Y'n$) into eccentric radius vector values ($\rho'n$, $\theta'n$);
- a step of comparing the radius (R) from the optical center (O) of the pre-edged lens (LE) with said eccentric radius vector values ($\rho'n$, $\theta'n$);
- a step of judging that said pre-edged lens (LE) can be edged to be fitted into said spectacle frame (201) if the radius (R) is longer than the maximum eccentric radius ($\rho'max$) of the eccentric radius vector values ($\rho'n$, $\theta'n$); and
- a final step of edging the lens (LE) held by the lens rotating shaft or shafts (18, 18a)."

"3. A lens edging machine comprising frame measurement means (54, 61) for digitally measuring respective radius vector values (ρ_n , θ_n) of vectors extending from an origin to a groove of a spectacle frame (201), means (1207) for storing the radius vector values (ρ_n , θ_n), and a lens rotation shaft or shafts (18, 18a) for holding a pre-edged lens (LE) so that the axis of the lens coincides with that of the shaft(s),

characterized in that

said machine further comprises a device for determining whether the pre-edged lens (LE) can be edged to be fitted to the spectacle frame (201), and including:

- lens measurement means (345, 611, 612) for digitally measuring the radius (R) of the circular pre-edged lens (LE) to be measured;
- means (1208) for memorizing the radius (R) measured by the lens measurement means;

- means (1217, 1218) for inputting into a calculation and judgement means (1213) an eccentric quantity (g_e, p_e) relating to an eccentricity of the geometric center (0) of the spectacle frame (201) with regard to the optical center (0') of the spectacle lens (LE) which coincides with the axis of the eye; and
- said calculation and judgement means (1213) having functions of the following steps for

converting the radius vector values (ρ_n, θ_n) stored in the means (1207) into coordinate values (X_n, Y_n),

transforming said coordinate values (X_n, Y_n) into eccentric coordinate values (X'_n, Y'_n) based upon the eccentric quantity (g_e, p_e) inputted by the means (1217, 1218) for compensating for said eccentricity,

converting the eccentric coordinate values (X'_n, Y'_n) into eccentric radius vector values (ρ'_n, θ'_n),

comparing the radius (R) from the optical center (0') of the pre-edged lens (LE) with said eccentric radius vector values (ρ'_n, θ'_n), and

judging that said pre-edged lens (LE) can be edged to be fitted into said spectacle frame (201) if the radius (R) is longer than the maximum eccentric radius (ρ'_{max}) of the eccentric radius vector values (ρ'_n, θ'_n)."

III. Against the above decision of the opposition division opponent II - appellant in the following - lodged an appeal on 30 April 1998 paying the fee on the same day and filing the statement of grounds of appeal on 13 July 1998 and raising objections under Article 52(2)(c) and (3) and Article 56 EPC.

IV. The proprietor of the patent - respondent in the following - replied to these objections and with a further letter of 20 January 2000 filed an amended claim 1 in which in the feature of the characterizing clause "lens measurement means ..." it is added

"whereby the pre-edged lens (LE) is held by the lens rotation shaft or shafts (18, 18a)"

following the word "to be measured" thereof.

V. Following the board's communication pursuant to Article 11(2) RPBA in which the board set out its provisional opinion of the case with respect to the issues of Articles 123(2) and (3), 52, 54 and 56 EPC, oral proceedings were held on 10 May 2001 in which the following documents were considered:

- (1) EP-A-0 092 364;
- (2) EP-B-0 061 918;
- (3) FR-A-2 062 532;
- (E1) US-A-3 586 448;
- (E3) Brochure "INGOH 130, Typ 1311 CNC";
- (E7) Affidavit of Mr Werner;
- (E8) Affidavit of Mr Karlveit Schmitt-Lieb and
- (E9) GB-A-1 492 985.

VI. The arguments can be summarized as follows:

a) appellant

- the general technical knowledge at the priority date can be seen from (2), (3) and (E1) from which it was known to verify whether or not a pre-edged lens was suitable to be edged and inserted into a given spectacle frame either by optically comparing the circumference of a pre-edged lens with a given template representing

the geometrical configuration of a spectacle frame or by comparing a photo thereof with an image of a lens; it was also known to carry out the grinding or edging step of the lens on a CNC machine in which step the eccentricity of the geometric axis of the lens and the human eye could be taken into account;

- considering the issue of inventive step of the subject-matter of claims 1 and 3, a direct measurement of a frame was **equivalent** to an indirect consideration thereof - i.e. the use of a template - since the latter was also based on the configuration of the frame;
- the most relevant piece of prior art could be seen in (E3) and its related affidavits; from (E3) it was known to measure the configuration of a frame, see step 2, central column thereof, to consider eccentricity values, to calculate an outside diameter of a lens suitable to fulfill all size-requirements of a given frame and to order the lens which was thereafter edged by a fully automatic CNC-type machine; it was therefore not necessary to assess an outside lens diameter as in contested claims 1 and 3 prior to the judgement of the suitability of any pre-edged lens;
- in claim 1 the assessed outside diameter could be far too big or too small, both possibilities being rather time and cost consuming, since either too much material must be ground off or the complete machine cycle must be repeated with another outside diameter lens; claim 1 was moreover silent about the way in which the frame and lens should be automatically measured and

whether these steps were carried out on the edging machine itself or outside thereof;

- although it was allowable to consider the description of a patent specification for interpreting a claim(s), it was however not allowable to restrict its teaching by such an interpretation;
- with respect to claim 3 it was observed that it was not prescribed therein that the measurement and edging step were carried out using the same shaft(s);
- the basic idea of claims 1 and 3, namely to determine whether or not a lens could be used in combination with a given spectacle frame is already solved in the prior art so that method steps such as transforming geometric parameters into other parameters for allowing any judging step to be carried out could not render inventive the claimed subject-matter either.

b) respondent:

- claims 1 and 3 related to a method for determining whether a pre-edged lens can be edged to be fitted to a spectacle frame and to a lens edging machine, respectively;
- claims 1 and 3 were literally restricted to "frame measuring" whereas claims 2 and 4 being dependent claims thereof, respectively, were based on the use of a template representing the frame geometry thereby allowing the use of spectacle frames which were open on one side thereof;

- it was admitted that claims 1 and 3 did not prescribe how the lens measurement step was carried out in detail; however, the description of the patent specification made it clear to any reader of the claims how this step had to be carried out to obtain the desired digital parameters which were thereafter transformed and compared to allow the decision whether or not a pre-edged lens was suitable to be edged in combination with a given spectacle frame;
- novelty not being disputed, the issue of inventive step of the subject-matter of claims 1 and 3 had to be assessed by applying the so-called "problem-solution-approach"; (E3) was seen as the starting point of the invention;
- according to (E3) a lens diameter was calculated so that an appropriate lens could be ordered - contrary to claims 1 and 3 which were based on the measurement of an existing lens, which parameters were used for deciding whether or not a pre-edged lens could be combined with a given spectacle frame, these steps being automatically carried out by the machine not necessitating a highly skilled person; what was envisaged with the installation according to (E3) was emphasized by (E7) i.e. an optical control of a lens on a monitor is mandatory;
- since in (E3) the lens was simply chosen out of a stock of lenses it was not foreseen or even appropriate to carry out measurement steps on any single lens/spectacle frame/template; nor was it possible to use these parameters for further steps necessary to decide the suitability of any pre-edged lens;

- claims 1 and 3 therefore solved the problem of how a method for determining whether a pre-edged lens could be edged to fit a spectacle frame could be performed automatically without the need of an experienced operator;
- not knowing the claimed invention, a person faced with the above problem would not be led by the available prior art to the claimed subject-matter, even if specific features of claims 1 and 3 were known per se; starting from (E3) the skilled man was not confronted with a one-way situation, see for instance (E1) and (3) teaching an optical judgement on the basis of a comparison of images according to the configurations of the lens and the spectacle frame;
- it had moreover to be considered that claims 1 and 3 did not claim single features, but rather their combination to achieve the desired result with respect to a given lens and spectacle frame.

VII. The appellant requested that the decision under appeal be set aside and that European patent No. 0 160 985 be revoked.

VIII. The respondent requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1, 2 and 4 as maintained by the opposition division and claim 3 filed with the letter of 20 January 2000.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 In claim 1 underlying the impugned decision a further feature relating to the final step of edging the lens was added, namely by prescribing that the lens is held by the lens rotating shaft or shafts "18, 18a".

This feature and the added feature of claim 3 "whereby the pre-edged lens (LE) is held by the lens rotation shaft or shafts (18, 18a)" is clearly derivable from originally filed Figures 1, 2A, 8, 16 and 19 so that the requirements of Articles 123(2) and 100c) EPC are met.

2.2 Incorporating the above feature into the independent claims restricts these claims in respect of their scope of protection, Article 123(3) EPC.

2.3 Summarizing, claims 1 to 4 are not open to objection under Articles 123 and 100c) EPC.

3. *Article 52(2)(c) and (3) EPC*

3.1 In the statement of grounds of appeal the appellant inter alia raised an objection in this respect. The following is observed by the board:

3.2 Claims 1 to 3 do not claim programs for computers or methods for performing mental acts **as such**, since the steps of digitally measuring parameters, converting measured values into differing coordinate values are linked to further method steps such as comparison of

values, judging of parameters and carrying out the step of edging a lens i.e. steps which are clearly technical.

Summarizing, claims 1 and 3 do not claim a mental act or program **as such**, but rather indicate a chain of steps to be carried out:

- (a) to achieve a result, namely whether or not a pre-edged lens can be fitted into a spectacle frame and
- (b) edging a lens according to the configuration of the selected spectacle frame.

3.3 Under these circumstances the requirements of Article 52(2)(c) and (3) EPC are met.

4. *Novelty*

The issue of novelty was not disputed by the appellant or the board so that it is not necessary to deal with this issue in detail. The crucial issue to be decided is thus the issue of inventive step.

5. *Inventive step*

5.1 As a general remark, it is observed that claims 1 and 3 are based on a frame measurement step/machine, whereas claims 2 to 4 are based on the use of a template representing the frame geometry, thereby allowing the use of spectacle frames which are open on one side thereof. Irrespective of this difference according to all claims, it is determined whether a pre-edged lens can be edged to be fitted to a spectacle frame. It has

to be added that using a template is simply a further step to be carried out, namely detecting the frame geometry and shaping a corresponding template which is used in the steps laid down in claims 1 and 3.

5.2 Appellant's argument that claims 1 and 3 do not prescribe in detail how the digital measurement step is carried out has to be rejected, since the patent specification seen as a whole contains sufficient information for a skilled person to carry out the measurement step in order to obtain the interrelationship of angle and radius as a synonym for any geometric configuration of a lens or a spectacle frame or a template, see EP-B1-0 160 985, page 6, line 43, to page 9, line 17, in combination with Figures 8 to 13. Therefore, whereas the description and Figures of the patent specification have served as a source for interpretation of the measurement feature of claims 1 and 3, they have not served as a source for limiting the scope of protection thereof - contrary to the appellant's argument.

5.3 The board does not see any necessity to further amend claim 3 with respect to the edging step, since it is clear from claim 3 that edging has to be carried out, see "a lens edging machine ...", whereby it is also clear that the lens is held by the lens rotation shaft or shafts "18, 18a" in both steps, namely when measuring and edging the lens, see claim 3 precharacterizing part "a lens rotation shaft or shafts (18, 18a) for holding a pre-edged lens (LE)".

5.4 The board's assessment of the issue of inventive step is based on the application of the so-called problem-solution-approach.

The most relevant piece of prior art is (E3) from which document it is basically known, see second page central column, remarks 1 and 2, to measure either a template or a spectacle frame; based on these parameters and a given eccentricity value an appropriate lens diameter is calculated which enables a lens to be chosen out of stock and to order it, see remarks 7 and 3 in column 2 and 3 of (E3). Thereafter no automatic lens measurement step is carried out when the preselected lens is edged. This is also emphasized by (E7), see page 3, second complete paragraph, where it is set out that an optical control of a preselected lens on a monitor is carried out by a **skilled operator** who decides whether or not the lens has a sufficient outer diameter with respect to any given spectacle frame.

5.5 Starting from this piece of prior art, the claimed invention addresses the problem of how a method/machine for determining whether a pre-edged lens can be edged to fit to a spectacle frame can be performed automatically without the need of an experienced operator.

5.6 The above problem of the invention is solved by the combination of features laid down in the independent claims 1 and 3. Their features safeguard that any pair of a pre-edged lens and spectacle frame is checked before edging is carried out by **automatically** measuring the pre-edged lens and the given spectacle frame and after processing the obtained data, deciding whether or not the pre-edged lens, after edging, can be fitted into the spectacle frame chosen. Measuring of the lens and the final edging therefore are carried out while the lens is held by one and the same rotating shaft(s). This enhances the precision of the lens edging and safeguards that the **desired** pre-edged lens is measured and related to the **given** spectacle frame. It is true

that claims 1 and 3 are silent about any preselection of the diameter of the pre-edged lens so that in principle an incorrect preselection could lead to a too small (inappropriate) diameter or to a too large diameter (severe grinding step) of the lens, but it has to be considered that this is not the problem addressed by the invention according to EP-B1-0 160 985.

5.7 It has now to be assessed whether or not the prior art can render obvious the **combination** of features of claims 1 and 3. Under these circumstances it is clearly irrelevant whether one or more of the features of claims 1 and 3 **per se** are known from the prior art since the solution to the problem set out in above remark 5.6 is based on **all features** of claims 1 and 3, respectively, since these features are interrelated in that configurations of a pre-edged lens and spectacle frame/template are measured and thereafter the obtained data are processed by converting for instance parameters of angle/radius in x- coordinate values which are transformed into corrected values for considering eccentricities between a geometric and an optical axis, thereafter reconverted into parameters of angle/radius before comparing and judging steps are carried out, resulting either in the step of final edging of the lens or not - the latter possibility resulting in the necessity of restarting the operation on the basis of another pre-edged lens (outer diameter). As set out above the lens is fixed in the rotational shaft(s) while being measured and finally edged.

5.8 The prior art in the form of (E1) and (3) is based on the teaching of an optical judgement on the basis of images corresponding to a pre-edged lens and to a

spectacle frame requiring the knowledge and skills of an experienced operator to decide whether a final edging step of the lens leads to a useful article or not.

5.9 Contrary to appellant's findings the basic idea of claims 1 and 3 is not directly derivable from the prior art even if it was already known, see for instance (2), (3) and (E1) reflecting general technical knowledge at the priority date to correctly assess whether a pre-edged lens could be edged to be used in combination with a given spectacle frame, however, not automatically and only with a skilled operator. From (E9) a double shaft "23, 24" is known between which the pre-edged lens is fixed while being ground in several steps, see reference signs "14, 15, 16" of Figure 1. This feature of claims 1 and 3 is therefore known per se from the prior art, however not in the claimed context, namely measuring and edging of a lens in one machine and with one and the same shaft(s).

5.10 Summarizing the above considerations claims 1 and 3 define not only novel but inventive subject-matter. Consequently these claims and their dependent claims 2 and 4 are valid and can form the basis for maintaining EP-B1-0 160 985 in amended form.

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 on the following basis:
 - claims 1, 2 and 4 underlying the impugned decision of 3 March 1998;
 - claim 3 filed on 20 January 2000;
 - description page 2 underlying the impugned decision;
 - description pages 3 to 12 according to EP-B1-0 160 985;
 - Figures 1 to 20B according to EP-B1-0 160 985.

The Registrar:



A. Counillon

The Chairman:



C. T. Wilson