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**DECISION**  
**of 30 September 2004**

**Case Number:** T 0356/01 - 3.4.2

**Application Number:** 94115368.6

**Publication Number:** 0645647

**IPC:** G02B 1/04

**Language of the proceedings:** EN

**Title of invention:**

Process for the reproduction of polyurethane lens

**Patentee:**

HOYA CORPORATION

**Opponent:**

Optische Werke G. Rodenstock

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56, 83, 100(b)

**Keyword:**

"Sufficiency of disclosure (yes) - burden of proof not discharged"

"Inventive step (yes) - formulation of the technical problem"

**Decisions cited:**

T 0032/85, T 0859/90, T 0409/91, T 0418/91, T 0435/91,  
T 0694/92, T 0939/92, T 0576/95, T 0355/97, T 0743/97,  
T 0998/97, T 0308/99, T 0097/00, T 0717/00

**Catchword:**

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Case Number: T 0356/01 - 3.4.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.2  
of 30 September 2004

**Appellant:** Optische Werke G. Rodenstock  
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**Representative:** Hock, Joachim  
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**Respondent:** HOYA CORPORATION  
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Tokyo (JP)

**Representative:** Albrecht, Thomas, Dr.  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
23 January 2001 concerning maintenance of  
European patent No. 0645647 in amended form.

**Composition of the Board:**

**Chairman:** A. G. Klein  
**Members:** F. J. Narganes-Quijano  
M. J. Vogel

## Summary of Facts and Submissions

- I. The appellants (opponents I) lodged an appeal against the interlocutory decision of the opposition division finding European patent No. 0 645 647 (based on European application No. 94 115 368.6) as amended according to the main request filed by the respondents (patent proprietors) during the first-instance proceedings to meet the requirements of the EPC.

The oppositions filed by opponents I and opponents II against the patent as a whole were based on the grounds of lack of novelty and of inventive step (Article 100(a) EPC), insufficiency of disclosure (Article 100(b) EPC) and inadmissible extension of subject-matter (Article 100(c) EPC).

Opponents II withdrew their opposition during the first-instance proceedings.

- II. In the decision under appeal the opposition division referred *inter alia* to the following documents

E1 : JP-A-5212732 and English translation

E2 : EP-A-0435306

D3 : US-A-5326501

and to experimental test reports and affidavits submitted by the respondents, and held that none of the grounds of opposition invoked by opponents I and opponents II prejudiced the maintenance of the patent as amended according to the main request.

III. During the appeal proceedings the parties referred to the following experimental and documentary evidence:

- A1 : experimental test report ("Versuchsbericht") filed by the appellants with the statement of grounds of appeal dated 05.06.2001,
- A2 : experimental test report filed by the respondents by letter dated 15.02.2002, the report including a picture of a lens,
- A3 : declarations signed by Masahisa Kosaka and Keiji Iwata filed by the respondents by letter dated 15.02.2002,
- A4 : experimental test report filed by the respondents by letter dated 30.06.2004, and
- A5 : experimental test report ("Analysenbericht") filed by the appellants by letter dated 27.08.2004.

IV. Oral proceedings were held before the Board on 30 September 2004 in the presence of the parties.

The appellants requested that the decision under appeal be set aside and that the patent in suit be revoked.

The respondents requested that the appeal be dismissed and that the patent be maintained as upheld by the opposition division or, on an auxiliary basis, as amended according to one of three auxiliary requests submitted during the appeal proceedings.

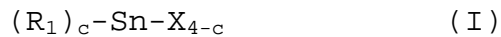
At the end of the oral proceedings the Board gave its decision.

V. The set of claims of the patent as amended according to the main request considered in the decision under

appeal consists - apart from the deletion of a passage erroneously inserted in the printed version of claim 3 as granted - of claims 1 to 15 as granted, the amendments to the patent only involving, as far as the claims are concerned, the deletion of claims 16 and 17 as granted. Claim 1 reads as follows:

"1. A process for the production of a polyurethane lens, which comprises the following steps (a), (b) and (c)

step (a): adding an alkyltin halide compound of the general formula (I)



wherein R1 is methyl, ethyl, propyl or butyl, X is a fluorine atom, a chlorine atom or a bromine atom and c is an integer of 1 to 3, to a polyisocyanate [sic] compound,

step (b): mixing two or more polythiol compounds which have different reaction rates with said polyisocyanate compound with the mixture of the alkyltin halide compound and the polyisocyanate obtained in step (a), and

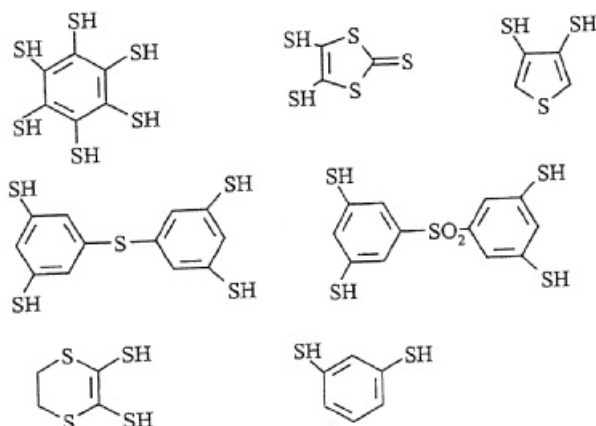
step (c): pouring the mixture obtained in step (b) into a lens mold and heating the lens mold."

Claims 2 to 15 are all appendant to claim 1.

The wording of the amended claims according to the auxiliary requests of the appellants is not relevant to the present decision.

VI. The arguments of the appellants in support of their requests can be summarised as follows:

According to established case law (decisions T 409/91 and T 435/91) sufficiency of disclosure presupposes that the skilled person is able to obtain substantially all embodiments falling within the ambit of the claims. The claimed process, however, is so broad as to the definition and the relative amounts of the components - see dependent claim 11 - and so indefinite as to the condition relating to the different reaction rates of the polythiols that the examples given in the description are not sufficient for carrying out the invention within the whole ambit of the claim. In particular, there can hardly be two polythiols having the same reaction rates with a polyisocyanate compound. In addition, the claimed subject-matter encompasses the use of polythiols that do not result in transparent optical lenses; thus, in none of the cases in which the following polythiols were used



was it technically possible to obtain, following the claimed process, a transparent polyurethane suitable for optical lenses. Consequently, reproducing the claimed process imposes an undue burden within the

meaning of decision T 32/85 that is contrary to the requirements set forth in Article 100(b) EPC. According to the established case law everything falling within a valid claim has to be inventive and what a skilled person would have done in the light of the state of the art depends on the technical result he had set out to achieve (decisions T 939/92 and T 694/92). Accordingly, the claimed process cannot involve an inventive step because it is irrelevant for the optical quality of the resulting lens whether the catalyst is first mixed with the polyisocyanate or with the polythiols. The experimental test report A1 shows the results of two tests, a first test in which two polythiols having different reaction rates are first mixed, and then the catalyst, an additive, the polyisocyanate, a UV absorber and an inner release are added to the mixture one after another, and a second test differing from the first test in that the catalyst is first mixed with the polyisocyanate before the remaining components and finally the two polythiols are added to the mixture. According to the results, the optical quality of the resulting polyurethane lenses as characterised by the parameters striae formation ("Schlieren"), yellowness index ("Gelbindex") and haze ("Trübung") is the same ("wie Referenz") according to both tests, i.e. no appreciable difference was observed between the lenses produced according to the two tests. The report also shows that the solubility of the catalyser in the polyisocyanate is higher than in the polythiols.

In addition, the respective glass transition temperatures of 70 and 116°C of the materials of the two lenses reported in respondents' report A4 are at

variance with those of the samples obtained according to the first and the second tests carried out in report A1; the glass transition temperature of the latter samples was measured following a temperature-dependent deformation test under cycling bending stress and, as shown in experimental test report A5, the values were of 127 and 132°C according to a first analysis and of 126 and 126°C according to a second analysis.

Although the tests of report A1 do not reproduce the disclosure of the closest prior art document E2, these tests prove that the invention does not involve any technical contribution to the prior art and that therefore the sole technical contribution of the invention is the provision of an alternative polymerisation process as such. The features of dependent claim 12 of the main request according to which "part of the alkyl tin halide compound is added" to one of the polythiols is in contradiction with the process of claim 1 and indicates that the mixing sequence according to claim 1 cannot achieve any technical contribution over the prior art.

Thus, the mixing sequence of the claimed process constitutes an arbitrary alternative selected among a small number of possible mixing sequences that the skilled person would have considered, the alternative being in addition obvious in view of the teaching of document E1.

Alternatively, a polar component presents a higher solubility in a polar medium than in a lower polar medium and therefore the catalysts used in the invention have a higher solubility in polyisocyanate



than in polythiol compounds. As supported by general text books on chemistry, at the priority date of the patent this knowledge constituted common general knowledge for the skilled person working in the field of polymerisation chemistry. The skilled person would therefore have considered mixing the polyisocyanate with the catalyst before mixing the resulting mixture with the polythiols.

As to the alleged commercial success of the invention, such considerations can be taken into account in the assessment of inventive step, but cannot justify alone the presence of an inventive step.

In dependent claim 3 the term "isocyanate-modified" should rather read "isocyanurate-modified".

VII. The arguments of the respondents are essentially the following:

The appellants have failed to provide evidence in support of their allegations of insufficiency of disclosure.

As acknowledged by the opposition division in the decision under appeal, comprehensive evidence involving a variety of polyisocyanate and polythiol compounds was submitted during the first-instance proceedings establishing that lenses free of optical strain and striae can be produced when the particular mixing sequence according to the invention is used.

As far as the optical characteristics of the lenses are concerned, appellant's experimental report A1 only

shows relative results without absolute measurement values that could be compared with each other. In addition, the components used in the tests deviate from those considered in document E2 and therefore the tests do not constitute a reproduction of the disclosure of document E2. As shown in the experimental test report A2, a polyurethane lens was produced by first mixing polythiols with a catalyst using a polyisocyanate and two polythiols specified in document E2 and, as shown in the picture enclosed with the report, the lens presented many striae. Finally, the tests performed by the appellants in report A1 were repeated as shown in the additional experimental test report A4 and, contrarily to the results obtained by the appellants, while in the lens produced according to the first of the appellant's test unwanted striae could be found, no striae which could affect the quality of the lens as a commercial product could be found in the lens produced by first mixing the alkyltin halide catalyst with the polyisocyanate compound.

Dependent claim 12 merely defines a particular embodiment of the claimed mixing sequence and the embodiment is not in contradiction with the mixing sequence defined in claim 1.

Consequently, the claimed process is not based on an arbitrary selection of mixing steps but on a purposive selection resulting in an improved process of mass-production of thick lenses with improved optical quality.

In addition, the appellants have failed to provide evidence showing that the fact that the solubility of

alkyltin halide catalysts in polyisocyanate compounds is higher than in polythiol compounds was known at the priority date of the patent. The mere reference to general textbooks on chemistry is not sufficient to discharge the appellants' burden of proof.

The affidavits A3 constitute evidence that the commercial success of the invention derives from the technical features of the claimed process.

### **Reasons for the Decision**

1. The appeal is admissible. However, for the reasons set out below, the appeal is not allowable with regard to the patent as amended according to the present appellant's main request which corresponds to the main request on which the contested decision is based.
2. Among the conclusions drawn by the opposition division in its decision (points I and II above), the appellants have contested during the appeal proceedings those pertaining to the opposition grounds of insufficiency of disclosure (Article 100(b) EPC) and of lack of inventive step (Article 100(a) together with Articles 52(1) and 56 EPC).
3. *Insufficiency of disclosure*
  - 3.1 The appellants have at a late stage of the appeal proceedings referred to the ground of opposition under Article 100(b) EPC initially invoked by opponents II and contested the sufficiency of disclosure of the patent in suit on the grounds that the claimed subject-

matter is broad and indefinite and in addition encompasses embodiments that cannot be performed.

The Board notes that the question of sufficiency of disclosure is a question of fact that must be assessed on the basis of the available facts and evidence and that the burden of proof lies on the appellant opponents (see for instance decisions T 418/91, point 4.1.4 of the reasons, and T 998/97, points 2, 6 and 6.1, none of them published in OJ EPO).

- 3.2 As submitted by the appellants, depending on the individual components and the relative amounts selected for carrying out the claimed process, the claimed subject-matter encompasses a large number of variants. However, the mere fact that the claim is broad, and in particular that the claimed process encompasses a number of variants going beyond the specific examples and the preferred embodiments disclosed in the description of the patent, is not in itself a ground for considering the patent as not complying with the requirements of sufficiency of disclosure set forth in Article 100(b) EPC (see decision T 743/97, not published in OJ EPO, point 14 of the reasons). Similar considerations apply to the objection raised by the appellants on the grounds that the condition recited in the claim relating to the different reaction rates of the polythiol compounds is indefinite. The patent specification contains clear and sufficient instructions (page 3, line 51 to page 4, line 4) enabling the skilled person to determine whether two given polythiol compounds have different reaction rates within the meaning of the invention and also contains examples of polythiol compounds satisfying this

condition (page 3, lines 16 to 50). Even the appellants have acknowledged during the appeal proceedings that there can hardly be two polythiol compounds having the same reaction rate with a given polyisocyanate compound, and the appellants themselves had no difficulty in selecting polythiol compounds satisfying the condition recited in the claim when carrying out the experimental tests shown in experimental test report A1 submitted in support of their submissions relating to the issue of inventive step (point VI above). Consequently, in the Board's view the fact that the claim does not specify how much the reaction rates of the polythiol compounds should differ from each other does not prejudice, in the absence of supporting arguments or evidence to the contrary, the sufficiency of disclosure of the claimed invention within the meaning of Article 100(b) EPC.

- 3.3 According to an additional line of argument developed by the appellants, it is not technically possible to obtain a transparent material for optical lenses with the seven polythiol compounds specified in the statement of grounds of appeal (see point VI above). The appellants' statement in this respect, however, constitutes a mere allegation that has not been substantiated by technical arguments or verifiable facts that could be challenged by the respondents, and in particular has not been supported by experimental evidence showing that the moulded bodies resulting from the use of the specific polythiol compounds referred to by the appellants in a process as claimed cannot be used as, or do not properly constitute optical lenses. Thus, the appellants' statement constitutes a mere allegation which does not meet the standards required

to prove that the requirement of Article 100(b) EPC is not fulfilled.

In addition, the description of the patent contains detailed information enabling the skilled person to select the individual compounds and also discloses classes of compounds and specific compounds suitable for carrying out the claimed process and the aforementioned statement of the appellants only involves isolated, specific polythiol compounds that are, in the absence of appropriate substantiation or evidential support, insufficient to dispute that the skilled person would be able to perform substantially all embodiments falling within the ambit of the claims (see decisions T 418/91 and T 998/97 cited in point 3.1 above).

3.4 The Board observes that during the appeal proceedings the appellants have submitted experimental evidence in support of the allegation that no technical contribution over the prior art is achieved by the claimed invention (point VI above). This evidence would, by its very nature, at the most call into question the achievement of the technical effects alleged in the patent specification, not however that the invention defined in the claim can be performed. Accordingly, this evidence, although pertinent for the assessment of the inventive merits of the case, is irrelevant for the issue of sufficiency of disclosure (see in this respect comments in decision T 743/97, *supra*, point 12 of the reasons).

3.5 In view of the foregoing, the Board concludes that the appellants' submissions do not *prima facie* discharge

their burden of proof in establishing that the skilled person would not be able to obtain substantially all embodiments falling within the ambit of the claimed invention on the basis of the patent disclosure and his technical knowledge within the meaning of decisions T 409/91 (OJ EPO 1994, 653, point 3.5 of the reasons) and T 435/91 (OJ EPO 1995, 188, points 2.2.2 and 2.2.3) cited by the appellants, or that he could do it only with undue burden within the meaning of decision T 32/85 (not published in OJ EPO, point 5 of the reasons) also cited by the appellants.

For these reasons, the Board sees no reason to depart from the conclusion drawn by the opposition division in the contested decision as regards the sufficiency of disclosure of the amended patent (Article 100(b) EPC).

4. *Inventive step - claim 1 of the main request*

4.1 Closest prior art - Distinguishing features

It has been uncontested by the parties that document E2 - or equivalently document D3 pertaining to the same patent family - represents the closest prior art. Document E2 discloses the production of a polyurethane lens by pouring a polymerisable mixture into a lens mould and heating the lens mould. According to some of the examples, the mixture is made of an alkyltin halide compound, a polyisocyanate compound and two or more polythiol compounds which have different reaction rates with the polyisocyanate compound. In particular, in example 13 listed in Table 1 the mixture contains dibutyltin dichloride as catalyst, a polyisocyanate compound consisting of 1,3-bis(isocyanatemethyl)cyclo-

hexane, and two polythiol compounds consisting of 2,5-dimercaptomethyl-1,4-dithian and pentaerythritol-tetrakismercaptopoacetate (page 7, lines 44 to 56 together with lines 31 to 38).

While claim 1 according to the main request requires that the alkyltin halide and the polyisocyanate compound are first mixed and the resulting mixture is then mixed with the polythiol compounds, document E2 refers to a "homogeneous mixture" of the components (page 5, lines 26 to 29; see also page 7, lines 31 to 33 and lines 44 to 46) without however disclosing either explicitly or implicitly whether the components are simultaneously mixed with each other or following some unspecified mixing sequence. Consequently, as maintained by the opposition division and as it has also been undisputed by the parties during the appeal proceedings, the single feature distinguishing the process claimed process from the process disclosed in document E2 is the sequence of mixing steps of the compounds specified in the claim.

#### 4.2 Technical effects of the claimed invention

4.2.1 According to the patent specification the process of the invention and more specifically the sequence of mixing steps specified in claim 1 permits the production of polyurethane lenses that are free of optical strain and striae with improved producibility, and in particular with improved production efficiency and yield, thus rendering the claimed process particularly suitable for the mass production of polyurethane lenses having a large central thickness and a large marginal thickness (see page 2, lines 18 to



32 together with page 2, line 54 to page 3, line 2, page 4, lines 6 to 11, and page 8, lines 53 to 55 and examples 1 to 11 listed in Tables 1 and 2).

As submitted by the appellants with reference to decisions T 939/92 (OJ EPO 1996, 309, point 2.4.2 of the reasons) and T 694/92 (OJ EPO 1997, 408, point 6), the question of the technical contribution actually achieved by the claimed invention over the prior art is pertinent for the formulation of the technical problem solved by the claimed subject-matter and therefore relevant to the assessment of the inventive step of the claimed invention. Nonetheless, the Board notes that in the assessment of inventive step according to the problem-solution approach the prior art to be taken into account in the determination of the technical contribution achieved by the invention is the closest state of the art (see for instance decisions T 576/95, point 3.2 of the reasons, and T 717/00, point 3.1, none of them published in OJ EPO).

- 4.2.2 The main line of argument developed by the appellants is that the claimed invention, and in particular the sequence of mixing steps defined in the claim, does not achieve a technical contribution over the prior art.

It is established case law of the Boards of Appeal that each party bears the burden of proof for the facts it alleged, and that the burden of proof in establishing that the invention achieves the technical effects alleged in the patent specification lies primarily on the patent proprietors (see decisions T 355/97, point 2.5.1 of the reasons, and T 97/00, point 3.1.6, none of them published in OJ EPO). Nonetheless, the patent

specification discloses examples of the claimed invention in which the alleged technical effects appear to have been achieved. In particular, examples 1 to 11 of the patent specification report on the efficient mass-production of lenses (200 lenses in the case of example 1, see page 5, line 7) that are free of optical strain and striae (Tables 1 and 2). In addition, during the first-instance opposition proceedings the respondents submitted technical arguments as well as comprehensive evidence in the form of experimental test reports and affidavits involving a variety of polyisocyanate and polythiol compounds in support of their submissions that lenses free of optical strain and striae are efficiently obtained in large numbers when produced according to the claimed process. It was on the basis of these facts and evidence that the opposition division concluded in the contested decision that, in the absence of verifiable counter-evidence filed by the present appellants, the alleged technical effects were achieved by the claimed subject-matter.

In these circumstances, and in view of the opposition division's finding that the patent proprietors have during the first-instance proceedings sufficiently proven their case and discharged their burden of proof, the Board concludes that in the present appeal the burden of proof is shifted onto the appellant opponents to establish their allegation that no technical contribution over the prior art is achieved by the claimed invention (see for instance decisions T 859/90, points 2.2 and 2.2.1 to 2.2.4 of the reasons, and T 308/99, point 6.2, none of them published in OJ EPO).

4.2.3 The appellants have referred during the oral proceedings to the feature of claim 12 dependent on claim 1 and according to which "part of the alkyl tin halide compound is added to the polythiol compound", and submitted that this feature is in contradiction with the mixing sequence specified in claim 1 and therefore at variance with any potential technical contribution resulting from the sequence of mixing steps of the claimed process.

The Board first notes that the reference to a contradiction would actually amount to an objection under Article 84 EPC. However, the requirements recited in Article 84 EPC do not constitute a ground for opposition under Article 100 EPC and, in addition, claims 1 and 12 do not result from any amendments to the granted claims but are identical to claims 1 and 12 as granted. Consequently, the Board has no power to examine the alleged contradiction as an objection under Article 84 EPC.

In addition, assuming - contrary to the submissions of the respondents - that such contradiction exists, no plausible technical argument or evidence has been advanced by the appellants in support of their view that the alleged contradiction between claims 1 and 12 would imply that the, or at least some of the alleged technical effects would not be achieved by the process defined in claim 1. Consequently, the submissions of the appellants in this respect are insufficient to conclude that no technical contribution results from the mixing sequence specified in the claim.

4.2.4 The appellants have also alleged that it is irrelevant for the optical properties of the resulting lens whether the catalyser is first mixed with the polyisocyanate or with the polythiol compound and have submitted experimental test report A1 in support of their allegation. The appellants have concluded that the sequence of mixing steps of the claimed process does not result in any technical contribution over the prior art.

According to report A1, a large number of lenses were produced according to two different tests, a first comparative test in which two polythiol compounds (MR8-B1 and MR8-B2) were first mixed and then dibutyltin dichloride and a polyisocyanate compound (MR8-A) were added to the mixture - together with other additives - one after another, and a second test based on the sequence of mixing steps according to the claimed process and differing from the first test in that the catalyst was first mixed with the polyisocyanate compound before the remaining components and finally the two polythiol compounds were added to the mixture. According to the results shown in report A1, the optical characteristics striae formation, yellowness index and haze observed in the lenses obtained in the first test were the same as those observed in the lenses obtained in the second test.

The Board first observes that the mixing sequence used in the first of the tests of report E2, i.e. the comparative test, does not reproduce the mixing sequence used in comparative example 5 of the patent specification in which the catalyst was added to a mixture of polyisocyanate and polythiol compounds

(page 5, lines 44 to 46) and that for this reason the results of report A1 do not contradict the results reported in the patent specification in support of the alleged technical effects.

In addition, the disclosure of the closest state of the art, i.e. document E2, does not specify the mixing steps of the starting components (point 4.1 above), it does not even exclude that the components are simultaneously mixed with each other, and consequently the first test of report A1 does neither reproduce nor constitute a representative embodiment of the process of the closest prior art document E2. It follows that report A1 does not provide a valid comparison of the claimed process with the process of the closest prior art.

During the oral proceedings, however, the appellants conceded that the optical characteristics of the lenses produced according to the two tests not only were the same, but that all the lenses obtained in both tests were also essentially free of optical strain and striae. In addition, although the tests shown in report A1 were repeated by the respondents in experimental test report A4 and, contrarily to the appellants' results, the lens produced by the respondents according to the first test did exhibit striae, the results reported in report A4 confirmed that the lens produced according to the second test following the mixing sequence of the invention was free of optical strain and striae. The experimental report A5 subsequently filed by the appellants and showing that the glass transition temperature of the samples reported in A4 deviated substantially from the corresponding measured values of

the samples obtained in report A1 would -  
irrespectively of the potential significance of the  
alleged glass transition temperature differences for  
the optical characteristics of the sample materials -  
at the most invalidate the results presented in  
respondents' report A4, but would not refute that the  
claimed process does result in lenses free of optical  
strain and striae as in fact not disputed by the  
appellants during the appeal proceedings.

In addition, since, as stated above, the first test of  
report A1 does not reproduce the process of the closest  
prior art, contrary to the appellants' assumptions it  
is immaterial for the technical contribution of the  
invention whether the optical characteristics of the  
lenses resulting from the first test are the same or  
not as those of the lenses produced in the second test  
following the mixing sequence of the invention because  
there is no requirement that the mixing sequence  
according to the invention be the sole mixing sequence  
resulting in lenses free of optical strain and striae.

Accordingly, the appellants' submission that it is  
irrelevant for the optical properties of the lens  
resulting from the claimed process whether the  
catalyser is first mixed with the polyisocyanate or  
with the polythiol compound does not disprove the  
technical effects allegedly achieved by the claimed  
invention.

- 4.2.5 Having regard to the conclusions in points 4.2.3 and  
4.2.4 above, the facts and evidence submitted by the  
appellants do not discharge their burden of proof in

establishing that the claimed process does not achieve the technical effects alleged in the patent.

4.3 Technical contribution over the closest state of the art - Formulation of the technical problem

4.3.1 Since the technical problem is to be objectively formulated on the basis of the technical contribution actually achieved by the claimed invention vis-à-vis the process of the closest prior art (point 4.2.1 above), it remains to be determined whether all, or at least some of the technical effects achieved by the claimed process and referred to in point 4.2.1 above amount to a technical contribution over the process disclosed in document E2.

During the appeal proceedings the appellants have submitted that the lenses obtained in example 13 of document E2 are free of optical strain and striae and that therefore the problem of producing such lenses has been already solved in document E2, at least at a low production scale, and the respondents responded, without however properly disputing the aforementioned appellant's submission, that the lenses are produced in document E2 only under specific conditions, and in particular using a small amount of reactants as shown in example 13.

The Board gives credence to the parties' submissions and concludes that the process of example 13 of document E2 results in lenses free of optical strain and striae, at least when produced under the specific conditions reported in the document.

This conclusion is not at variance with the presence of striae in the lens produced according to experimental test report A2 filed by the respondents and shown in a picture annexed to the report because this lens has not been obtained according to the disclosure of document E2. The reason for this is that the lens was produced according to a sequence of mixing steps that is neither explicitly disclosed nor implicitly derivable from document E2 (see fourth paragraph of point 4.2.4 above), and in addition, although each of the components used in the production of the lens (H6-XDI as polyisocyanate, DMMD and PETMA as polythiol compounds, and dimethyltin dichloride,) are individually disclosed in document E2 (example 1 and Table 1), the specific combination of components used in report A2 does not reproduce any of the specific examples disclosed in the document.

- 4.3.2 It follows from the conclusions in points 4.2.5 and 4.3.1 above that the claimed process achieves the production of lenses free of optical strain and striae, but that this result is already achieved in the closest prior art. Therefore, the technical problem solved by the claimed process cannot be seen solely in the production of lenses that are free of optical strain and striae.

In addition, the process as claimed is not restricted to - and therefore encompasses more than just - the mass-production of lenses or the production of thick lenses and for this reason the Board cannot follow the respondents' submission according to which the invention solves the technical problem of the mass production of lenses and/or the production of thick lenses free of optical strain and striae.



The appellants for their part have also submitted that the invention merely solves the problem of finding an alternative process to that disclosed in document E2. This formulation of the problem cannot be followed either. As noted in point 4.2.1 above, the improved producibility, and in particular the improved production efficiency and yield of the claimed process constitutes a further technical effect allegedly achieved by the invention. This technical effect is supported by the patent specification (page 2, lines 28 to 32 and page 4, lines 6 to 11) and by the comprehensive evidence submitted by the respondents during the proceedings. In addition, the appellants themselves have conceded in their submissions relating to the alleged common general knowledge of the skilled person (see point 4.4.2 below) that, as already mentioned in the patent specification (page 3, lines 1 and 2, and page 4, lines 6 and 7), the sequence of mixing steps of the invention takes into account the relative solubility of the components, and in the Board's view this advantageous feature alone would support, at least to a certain degree, the improved producibility and in particular the improved production efficiency and yield of the claimed process over the process known from document E2.

- 4.3.3 In view of the above, the Board concludes on the basis of the content of the patent specification and the parties' submissions that the technical problem objectively solved by the claimed invention is to be seen in improving the producibility, and in particular the production efficiency and yield of the process of production of lenses free of optical strain and striae.

#### 4.4 Assessment of inventive step

4.4.1 The disclosure of document E2 focuses on the physical and more particularly on the optical properties of lenses obtained from a specific class of polythiols (see abstract of document E2), and the document is not primarily concerned with the problem of the producibility or the efficiency and the yield of the process of production of the lenses. Thus, document E2 alone does not hint towards any solution to the technical problem formulated above.

In addition, none of the prior art documents referred to by the parties during the appeal proceedings discloses or suggests the solution according to the claimed subject-matter. In particular, document E1 relates to the production of polyurethane lenses and addresses the problem of efficiently producing the lenses with a high yield (paragraph [0004] of the English translation); however, although the document teaches the incorporation of additives such as a reaction catalyst separately in a polythiol and in a polyisocyanate compound before mixing the compounds (paragraphs [0013] to [0015]), in all the examples the catalyst is first mixed with the polythiol compound and the document fails to disclose or suggest the incorporation of the catalyst to the polyisocyanate compound before mixing the latter with the polythiol compound.

4.4.2 The first line of argument of the appellants is that, as shown in the results of report A1, a halide is more soluble in a polyisocyanate than in a polythiol and

that this property constituted common general knowledge at the priority date of the contested patent, and that accordingly the skilled person seeking to implement the teaching of document E2 would have considered first mixing the halide with the polyisocyanate before incorporating the polythiols into the mixture. However, after the respondents had challenged that the aforementioned property constituted common general knowledge at the priority date of the patent, the appellants have failed to submit any documentary evidence in support of their allegation that the property was known at the priority date of the patent, let alone that the property would have been considered by the skilled person as pertinent in the producibility or in the efficiency and the yield of the production of a lens obtained from the polymerization product of the resulting mixture. In addition, none of the documents on file gives a hint towards the common general knowledge alleged by the appellants.

According to a further line of argument of the appellants, the claimed process does not achieve any technical contribution over the prior art and the sequence of mixing steps as claimed constitutes an arbitrary alternative. However, as concluded in point 4.3.3 above, the claimed process cannot be considered to constitute a mere arbitrary alternative.

For these reasons, none of the lines of argument developed by the appellants are sufficient to successfully challenge the inventive step of the claimed process.

4.4.3 In view of the foregoing, the Board concludes that the subject-matter of claim 1 according to the main request of the respondents involves an inventive step with regard to the prior art cited by the parties during the appeal proceedings.

In view of this conclusion, the submissions of the parties relating to the commercial success of the invention, and in particular the affidavits A3 filed by the respondents, do not need to be considered by the Board.

5. *Dependent claims*

The same conclusion in point 4.4.3 above applies to dependent claims 2 to 15 by virtue of their dependence on claim 1.

5.1 Other issues

The appellants have objected that the expression "isocyanate-modified polyisocyanate compound" in dependent claim 3, which refers back to claim 1, should rather read "isocyanurate-modified polyisocyanate compound". This objection constitutes, by its very nature, an objection under Article 84 EPC. In addition, apart from the correction of an obvious error in the printed version of claim 3 as granted (see point V above), claims 1 and 3 according to the main request are identical to the respective claims 1 and 3 of the patent as granted and therefore the expression referred to by the appellants does not result from any amendment to the granted claims. Consequently, for reasons analogous to those set forth in the second paragraph of

point 4.2.3 above, it is not incumbent upon the Board to consider the objection raised by the appellants.

6. Having regard to the above, none of the submissions of the appellants prejudices the maintenance of the patent as amended according to the main request of the respondents.

## **Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

P. Martorana

A. G. Klein