

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 8 June 2000

Case Number: T 1145/97 - 3.3.3

Application Number: 90100796.3

Publication Number: 0379130

IPC: G11B 7/24

Language of the proceedings: EN

Title of invention:

Optical disk substrate, optical information-storage medium,
and process and apparatus for manufacturing the optical disk
substrate

Patentee:

IDEMITSU PETROCHEMICAL CO., LTD.

Opponent:

Bayer AG

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

"Novelty - degree of purity distinguishing"

"Inventive step - relevance of a feature not recognised in the
prior art"

Decisions cited:

T 0205/83, T 0629/90

Catchword:

-



Case Number: T 1145/97 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 8 June 2000

Appellant:
(Proprietor of the patent)

IDEMITSU PETROCHEMICAL CO., LTD.
6-1, Shiba 5-chome
Minato-ku
Tokyo 108-0014 (JP)

Representative:

Gille Hrabal Struck Neidlein Prop Roos
Patentanwälte
Brucknerstrasse 20
D-40593 Düsseldorf (DE)

Respondent:
(Opponent)

Bayer AG
Konzernbereich RP
Patente und Lizenzen
D-51368 Leverkusen (DE)

Representative:

Rau, Manfred, Dr. Dipl.-Ing.
Rau, Schneck & Hübner
Patentanwälte
Königstrasse 2
D-90402 Nürnberg (DE)

Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 2 October 1997
revoking European patent No. 0 379 130 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: C. Gérardin
Members: P. Kitzmantel
J. C. M. De Preter

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 379 130 in respect of European patent application No. 90 100 796.3 in the name of IDEMITSU PETROCHEMICAL CO. LTD., which had been filed on 16 January 1990, was announced on 2 November 1994 on the basis of ten claims, independent Claims 1, 3, 5 and 8 reading as follows:

"1. An optical disk substrate, comprising an amount of foreign substance, characterized in that the foreign substance instance (I) of said foreign substance calculated from the following equation:

$$I = \Sigma \{ [\frac{1}{2}(d_{i+1} + d_i)]^2 \times (n_i - n_i') \} / W,$$

wherein I denotes the foreign-substances index, d_i denotes an i-th numerical value (μm) for dividing a range of the particle diameter, and n_i denotes the number of foreign substances having a particle diameter of less than d_{i+1} and not less than d_i , and detected in the solvent, n_i' denotes the number of foreign substances involved in the solvent before use, and W denotes the weight (g) of a material has a value of not more than $1 \times 10^5 \mu\text{m}^2/\text{g}$."

"3. An optical information-storage medium, comprising the optical disk substrate of claim 1 and a layer formed thereon for recording information."

"5. An injection-molding apparatus suitable for manufacturing the optical disk substrate according to claim 1, characterized in that it comprises a cylinder

having an inner wall lined with a Co-Ni-Mo-Cr alloy, and a screw having a surface thereof coated with a TiC layer and a TiN layer."

"8. A process for manufacturing an optical disk substrate according to claim 1, characterized by injection molding an unmelted polycarbonate powder of a polycarbonate having a viscosity average molecular weight of 10,000 to 22,000 in an injection-molding apparatus, comprising a cylinder having an inner wall lined with a Co-Ni-Mo-Cr alloy, and a screw having a surface thereof coated with a TiC layer and a TiN layer."

Claims 2, 4, 6, 7, 9 and 10 were dependent on the respective independent claims.

II. Notice of Opposition requesting revocation of the patent in its entirety on the grounds of Article 100(a) EPC was filed by BAYER AG on 21 June 1995.

The opposition was *inter alia* based on documents

D1: EP-A-0 300 485 (to be considered under Article 54(3) EPC),

D4: *Plastverarbeiter*, vol. 36 (1985) No. 5, pages 63, 64, 66; "Eine maßgeschneiderte Maschine",

D5: *Plastics 85*, proceedings of the SPE 43rd annual technical conference and exhibition, 1985, "Polycarbonate Resins for Optical Memories and Compact Disks" by R. Riess and H. Loewer,

D6: Kunststoffe 76 (1986) 10, pages 917 to 919,
"Polycarbonate- ein Werkstoff für optische
Speichermedien", by W. Siebourg,

D10: EP-A-0 293 769, and

D11: Polycarbonate Raw Material Testing Data from
Idemitsu Petrochemical Co. Ltd., February 1988,
submitted with the Opponent's opposition brief
dated 19 June 1995 (page 8, point 4).

III. By its decision issued in writing on 2 October 1997,
the Opposition Division revoked the patent.

- (i) It held *inter alia* that the foreign-substances index (FSI) of the claimed optical disc substrate did not qualify as a distinguishing feature and that the subject-matter of Claim 1 of the main request was therefore anticipated by D1, D3 and D5 to D10. The reason was that, in application of the principle laid down in decision T 205/83 (OJ EPO 1985, 363), this feature did not amount to a genuine substance parameter. Novelty could also not be established, in the Opposition Division's view, by restriction of the FSI to 1.5 $\mu\text{m}^2/\text{g}$ and by introduction of a product-by-process feature into Claim 1 of an auxiliary request.
- (ii) The Opponent's objection of prior public use, based on document D11, was rejected as being insufficiently substantiated.
- (iii) The injection-molding apparatus according to Claim 5 and the process according to Claim 8 of both requests were held to be novel and inventive.

IV. On 20 November 1997 the Patentee (Appellant) lodged an appeal against the decision of the Opposition Division and paid the appeal fee on the same day. The Statement of Grounds of Appeal was submitted on 10 February 1998.

At the oral proceedings held on 8 June 2000 the Appellant submitted as its sole request an amended set of six claims superseding thereby the previous requests, i.e. the main and three auxiliary requests filed with the Appellant's submission dated 10 May 2000.

Claim 1 of this sole request reads as follows:

"1. An optical disk substrate, comprising an amount of foreign substance, characterized in that the disk substrate is prepared from polycarbonate resin having a viscosity average molecular weight of 10,000 to 22,000 and has a foreign-substances index I calculated from the following equation:

$$I = \Sigma\{[\frac{1}{2}(d_{i+1} + d_i)]^2 \times (n_i - n_i')\} / W,$$

wherein I denotes the foreign-substances index, d_i denotes an i-th numerical value (μm) for dividing a range of the particle diameter, and n_i denotes the number of foreign substances having a particle diameter of less than d_{i+1} and not less than d_i , and detected in the solvent, n_i' denotes the number of foreign substances included in the solvent before use, and wherein W denotes the weight (g) of a material, said foreign-substances index having a value of not more than $3 \times 10^4 \mu\text{m}^2/\text{g}$."

The further independent Claims 2, 3 and 4 of this request are identical to granted Claims 3, 5 and 8 (cf. point I supra). Claims 5 and 6 are dependent on Claim 4.

V. The arguments presented by the Appellant in its written submissions and during the oral proceedings may be summarized as follows:

- (i) The finding of T 205/83, namely to disregard the amount of impurities in a copolymer for the assessment of its novelty, could not be applied to the optical disk substrate according to the subject-matter of the patent in suit. These substrates were products comprising polycarbonate and additives, whose properties - as evidenced by the experimental data in the patent specification - were considerably affected by their foreign-substances index (FSI).
- (ii) Furthermore, T 205/83 was at variance with the EPO's jurisprudence concerning the novelty of natural occurring products and of enantiomers.
- (iii) The claimed subject-matter was not anticipated by any of the citations on file, particularly D1, because these did not make available optical disk substrates meeting the required FSI.
- (iv) The subject-matter of Claim 1 was also inventive over the cited prior art, which would not suggest that by respecting the required FSI limit the bit error ratio could be improved; nor would there be any hint in the prior art that the desired low FSI could be achieved by the combined measures of

(1) using a polycarbonate raw material having a relatively low FSI and (2) melt processing this material in an injection moulding apparatus as specified in present Claim 3.

(v) The statement in D5 concerning the necessity of extreme purity of the polycarbonate raw material could not be interpreted to encompass the specified low FSI, especially because document D6, a document also originating from the Opponent Bayer, explicitly stated that bigger particles would not impair the sound quality of optical audio disks.

VI. By letter dated 8 September 1998 the Opponent had withdrawn its opposition and, consequently, ceased to be a party to the appeal proceedings, as far as the substantive issues were concerned (cf. EPO's communication of 24 September 1998).

VII. The Appellants requested that the decision under appeal be set aside and that the patent be maintained on the basis of the set of claims submitted at the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.
2. The competence of the Board for reviewing the first instance's decision of revocation of the patent in suit is not affected by the Opponent's withdrawal of the opposition (cf. T 629/90, OJ EPO 1992, 654).

3. *Amendments*

- 3.1 Claim 1 combines the features of original Claims 1 (optical disk substrate) and 2 (polycarbonate resin, molecular weight range) with the statement on page 4, lines 15 to 31 (definition of FSI) and the FSI limit of $3 \times 10^4 \mu\text{m}^2/\text{g}$ on page 5, penultimate paragraph of the original application (= granted Claims 1 and 2; page 3, lines 45 to 46 of patent specification).

With respect to the FSI limit of $3 \times 10^4 \mu\text{m}^2/\text{g}$ in Claim 1 it is noted that the figure of $1.5 \times 10^4 \mu\text{m}^2/\text{g}$, which had been introduced into Claim 1 of the auxiliary request before the Opposition Division, contrary to the finding in point 3.1 of the Reasons of the decision under appeal, extended beyond the content of the application as filed, because the only possible basis therefor, the FSI value of Example 1 (cf. page 14, Table 1), does not disclose this value in a general context, but only in combination with a specific polycarbonate raw material and specific manufacturing conditions.

- 3.2 Claim 2 is based on original Claim 3 (granted Claim 3); Claim 3 is based on original Claim 5 (granted Claim 5); Claim 4 is based on a combination of original Claims 8 and 5 (granted Claim 7); Claim 5 is based on original Claim 9 (granted Claim 8); and Claim 6 is based on original Claim 10 (granted Claim 9).
- 3.3 The scope of operative Claim 1 is narrower than that of its granted version, the scope of the further independent claims is unaltered.
- 3.4 The present set of claims, thus, comply with the requirements of Article 123(2) and (3) EPC.

4. *Meaning of the terms "foreign substances" and "foreign-substances index (FSI)"*

According to page 3, lines 35 to 36 of the specification the term "foreign substances" "means essentially contaminants, such as impurities, dust or carbonized material of raw resin, which have been included in the optical disk substrate at various stages."

The FSI, according to the equation in Claim 1, is essentially a parameter combining particle size and particle size distribution of "foreign substances".

Measures, which are recommended in the patent specification in order to achieve the desired low FSI of the optical disk substrate, are: (i) to keep the amount of "foreign substances" in the polycarbonate raw material low (page 5, lines 39 to 40), (ii) to use the raw material as unmelted powder (page 5, lines 21 to 24) and (iii) to carry out the injection moulding in an apparatus, whose polymer-contacting surfaces are specifically coated with materials providing good corrosion resistance and non-adhesiveness, preventing thereby the formation and deposition of carbonized decomposition products, acting as "foreign substances" (page 4, line 53 to page 5, line 4).

5. *Citations*

5.1 Document D1

This document, which is only to be considered in the context of Article 54(3) EPC, relates to a process for producing a low-particle polycarbonate resin moulding material, which comprises directly supplying to a vented extruder a wet powder of a polycarbonate resin having a viscosity average molecular weight of 13,000

to 30,000, which powder comprises water and solvent in specific amounts and which had been prepared from a resin solution, which had been purified so as to have a reduced particle content, and extruding the wet powder to obtain pellets containing not more than 20 ppm of a residual halogenated hydrocarbon (Claim 1; page 5, lines 1 to 2).

According to a preferred embodiment the purification of the polycarbonate resin solution is carried out by a neutralisation treatment comprising at least three stages of washing with water, washing with phosphoric acid aqueous solution and washing with water, the phase separation between the washing stages being performed by centrifugation, and by finally passing the resin solution through a hydrophobic porous filter to obtain a solution having a water content of 0.2% or less (page 4, lines 14 to 22).

5.2 Document D4

This document relates to an injection moulding machine for the manufacture of compact disks, which is characterized by an absolutely dust-free working environment. By that and by the use of very pure raw materials defects of the disks shall be prevented (page 63, Headnote; page 66, left hand column, line 9 from bottom to center column, line 5).

5.3 Document D5

This article comprises a review of polycarbonate developments for optical memories and compact disks. The Section "3. Special Polycarbonate Resin" on page 471 summarizes some of the requirements of compact

disks, the first two lines in the right hand column reading: "Finally, the plastic raw material has to be extremely pure to guarantee an error-free data retrieval."

On page 471, right hand column, third paragraph D5 sets out that this requirement is attained by the polycarbonate Makrolon CD-2000, which has a melt flow index of 55 to 60 g/10 min (at 300°C), corresponding according to the Opponent to a weight average molecular weight of about 20,000 (and, consequently, to a similar viscosity average molecular weight: "Die Kunststoffe, Kunststoff-Handbuch 1, edited by Dr. Bodo Carlowitz, Hanser Verlag 1990, page 923, last two paragraphs").

5.4 Document D6

This document relates to the requirements to be met by materials, especially polycarbonate resins, used for optical storage disks (page 917, right hand column, Section 1.3 "Löschbare optische Speicher", last paragraph "Anforderungen an Werkstoffe für optische Speicherplatten").

The first paragraph of Section 2.5, left hand column on page 919 "Reinheitsanforderungen" reads: "Die Reinheitsanforderungen an Werkstoffe für Speicherplatten sind hoch. Zwar kann das CD-Player-System eine gewisse Anzahl von Verunreinigungen tolerieren, ohne daß die Tonqualität leidet, sie sind aber aus verkaufstechnischen Gründen nicht akzeptabel, da größere Teilchen wegen des verspiegelten Hintergrundes leicht zu erkennen sind" ("The purity requirements of materials for storage disks are high. While the CD-player-system can tolerate a certain amount of impurities without deterioration of the sound quality, they cannot be accepted for commercial

reasons, because, owing to the mirror-like background, larger particles can be easily recognized" - translation by the Board).

5.5 Document D10

This document relates to a polycarbonate for use in production of a disk substrate having a low molecular weight polymer content of not more than 3% by weight, an unreacted bisphenol content of not more than 20 ppm, and a methylene chloride content of not more than 20 ppm, prepared by extracting the impurity-containing powdery polycarbonate with a ketone, e.g. acetone or methyl ethyl ketone (Claims 1, 3, 5).

These resins provide improved adhesion to the recording film and prevent corrosion of this film by the substrate as well as corrosion of the mould (page 2, lines 19 to 22; page 5, lines 23 to 28).

In order to prevent the incorporation of dust into the polycarbonate resin, D10 recommends that the preparation of the polycarbonate resin be carried out in a single apparatus (page 2, lines 34 to 38; page 5, lines 33 to 37; page 12, Table 2).

6. Novelty

6.1 Decision T 205/83

That decision sets out in point 3.2.3, last paragraph that "a known product does not necessarily acquire novelty merely by virtue of the fact that it is prepared in a purer form".

Following this line of thought, the novelty of a vinyl ester/crotonic copolymer, which was defined by reference to known conditions of preparation, was

denied, because the fact that the so prepared copolymers had a lower content of bad-smelling monomer was not considered a substance parameter of the copolymer (point 3.2.3 first and second paragraph).

The above-mentioned finding of T 205/83 is not applicable to the optical disk substrates according to present Claim 1, because these are not chemical substances (compounds), but moulded three-dimensional bodies, which have been prepared by melt shaping of a polycarbonate raw material, which may or may not comprise additives (page 4, lines 17 to 18). The essence of these optical disk substrates is, thus, not restricted to the features of the polycarbonate resin *per se*, but also comprises the features contributed by any further components, including "foreign substances", and, furthermore, the features resulting from the shaping operation.

- 6.2 Consequently, the feature in Claim 1, which limits the FSI to $3 \times 10^4 \mu\text{m}^2/\text{g}$, is to be considered as a characteristic of the claimed optical disk substrate.
- 6.3 None of the documents on file mentions the FSI of an optical disk substrate prepared from a polycarbonate resin.
- 6.4 The only document indicating particle sizes of impurities is D1.

For the reasons to follow, the FSI values which may be calculated from these particle size data do not allow the conclusion, that D1 discloses an optical disk substrate meeting the FSI requirement according to present Claim 1.

6.4.1 Tables 1 to 5 of D1 disclose the size distribution of impurity particles in the three ranges 0.5 to 1 μm , 1 to 10 μm and 10 to 100 μm . Pursuant to the Appellant (page 14, second paragraph of the Statement of Grounds for Appeal), the lowest FSI value which can be calculated from this disclosure is that of $1.2 \times 10^4 \mu\text{m}^2/\text{g}$ according to Run 21 in Table 5 (page 15 of D1; following the method of calculation in the Opponent's submission dated 25 March 1996, the exact value for this Run 21 is $1.236 \times 10^4 \mu\text{m}^2/\text{g}$: $0.5625 \times 5300 + 30.25 \times 210 + 3025 \times 1 = 12358.75$).

6.4.2 However, this figure represents the FSI of the polycarbonate **raw material** and for determining the FSI of the injection moulded optical **disk substrate** it must be taken into account that, if no special precautions are taken, the subsequent pelletisation and injection moulding of the polycarbonate raw material necessarily entail the formation of some carbonized material, i.e. of "foreign substances", enhancing thereby the FSI by a margin of from 1×10^4 to $5 \times 10^5 \mu\text{m}^2/\text{g}$ (cf. page 4, lines 44 to 52 of the patent specification). On that assumption the FSI of an optical disk substrate prepared from the polycarbonate raw material according to Example 5, Run 21 would be **between about $2.2 \times 10^4 \mu\text{m}^2/\text{g}$ and about $51 \times 10^4 \mu\text{m}^2/\text{g}$.**

6.4.3 In view of this mandatory enhancement of the FSI and since Example 5 of D1 (in conjunction with Example 1, to which the former example refers) does not foresee any special precautions in order to prevent the formation of foreign substances (D1, page 13, lines 55 to 56 in conjunction with page 8, lines 21 to 41), it cannot be concluded, **despite the FSI speculations set out in the previous paragraph**, that an optical disk substrate, which is prepared from a polycarbonate raw material according to Run 21 of Example 5 having a FSI

of $1,2 \times 10^4 \mu\text{m}^2/\text{g}$, **must necessarily lead** to the formation of an optical disk substrate, whose FSI has a value of not more than $3 \times 10^4 \mu\text{m}^2/\text{g}$, this being the maximum value according to present Claim 1.

6.5 Furthermore, in spite of the facts that

- (i) the patent in suit allows the polycarbonate raw material to be melt shaped by a conventional injection moulding apparatus, whose polymer-contacting surfaces are **not** specifically coated with materials providing good corrosion resistance and non-adhesiveness, and that
- (ii) the washing and solvent extraction steps of the polycarbonate resin raw material, which are referred to in the patent in suit (page 4, lines 12 to 16; page 5, lines 36 to 39; page 6, lines 15 to 21), are not essentially different from the purifying methods applied according to e.g. D1 and D10 (cf. points 5.1 and 5.5 supra), these documents cannot be considered to implicitly disclose optical disk substrates having the desired low FSI, because the available evidence does not suggest that the intensity of the prior art purification was sufficient to achieve this degree of purity.

6.6 This conclusion is also supported by the fact that the Opponent, though being an important supplier of polycarbonate resins for the production of compact disks, failed to provide convincing evidence of prior public use of optical disk substrates having the low FSI values specified in Claim 1; document D11 submitted in this respect, was justly disregarded by the

Opposition Division, because it did not comprise adequate substantiation (cf. point 9 of the Reasons of the decision under appeal).

This failure underscores that optical disk substrates of the state of the art made from polycarbonate resins purified by hitherto conventional purification methods did not meet the stringent FSI requirements of present Claim 1.

6.7 The subject-matter of Claim 1 is, thus, novel over the citations, including the Article 54(3) document D1.

7. *Inventive step*

While the ground for the decision under appeal was lack of novelty, it is clear from that decision that the issue of inventive step had also been considered before the first instance (cf. reasons, point 8). In view of that fact and also because the Appellant requested the Board to decide on the maintenance of the patent and presented arguments with regard to that issue in the Statement of Grounds for Appeal, the Board, exercising its competence under Article 111(1) EPC to act on behalf of the first instance, has decided to also investigate into the issue of inventive step.

7.1 Problem to be solved and solution thereof

7.1.1 According to page 2, lines 50 to 51 and 55 to 56 of the specification (page 3, lines 23 to 30 of the original application) the problem underlying the claimed invention was the provision of an optical disk substrate and an information-storage medium based thereupon having improved recording and/or reading out characteristics of high quality and reliability.

In view of the available evidence (see the following discussion) and the cited prior art the Board is satisfied that this is the objective technical problem with which the skilled person was confronted.

7.1.2 According to present Claim 1 this problem is solved by the provision of an optical disk substrate, which is prepared from a polycarbonate resin having a certain molecular weight range and a FSI of not more than $3 \times 10^4 \mu\text{m}^2/\text{g}$.

7.1.3 The available evidence shows that the existing technical problem is effectively solved by this restriction of the FSI.

Favourable bit error ratios, representing a measure for the quality and reliability of the recording and reading out characteristics of a disk, are indeed achieved when the FSI value of the disk substrate is below $3 \times 10^4 \mu\text{m}^2/\text{g}$ in the following cases:

- (i) when the disk is moulded from polycarbonate resin having FSI values between $1,500 \mu\text{m}^2/\text{g}$ (Example 5) and $8,000 \mu\text{m}^2/\text{g}$ (Example 1) in the form of pellets (Table 1, Examples 1 and 2) or an unmelted powder (Table 2, Examples 4 and 5) in an injection moulding apparatus having an inner wall lining of Co-Ni-Mo-Cr alloy and a TiC/TiN coated screw; and
- (ii) when the disk is moulded from a polycarbonate resin having an FSI value of $4,800 \mu\text{m}^2/\text{g}$ in the form of an unmelted powder (Table 2, Example 6) in an injection moulding apparatus having an inner wall lining of nitride and a Ni-SiC coated screw.

Conversely, unsatisfactory bit error ratios are obtained when the FSI value of the disk substrate is above $3 \times 10^4 \mu\text{m}^2/\text{g}$, because

- (iii) in spite of the use of an injection moulding apparatus having an inner wall lining of Co-Ni-Mo-Cr alloy and a TiC/TiN coated screw, the polycarbonate resin pellets, which are used, have (too) high a FSI value of 15,000 (Table 2, Example 7) or 25,000 (Table 1, Example 3; the figure of 25,000 for the FSI of the raw material used according to Example 3 is the corrected value of the originally disclosed value of 2,500 proffered at the oral proceedings, which was obviously inconsistent with the FSI indicated in Table 1), or because
- (iv) in spite of the use of polycarbonate resin pellets having a FSI of only $8,000 \mu\text{m}^2/\text{g}$, an injection moulding apparatus is used, which has an inner wall lining of nitride and a Ni-SiC coated screw (Comparative Example and Table 1).

From these results it may be concluded that in order to obtain the desired low FSI values of the optical disk substrates, which in turn provide favourable bit error ratios, a balance is required of the following parameters: FSI value of the polycarbonate raw material, heat history of the material before the injection moulding (pelletisation or not) and surface quality of the polymer-contacting surfaces of the injection moulding apparatus.

7.2 Obviousness

This issue turns on the question whether the prior art contained any suggestions to solve the existing technical problem as set out in point 7.1.1 supra by the measures taken according to present Claim 1, particularly by the setting of a FSI limit of $3 \times 10^4 \mu\text{m}^2/\text{g}$.

Since the prior art, which is to be considered under this issue (thus, not including the Article 54(3) document D1), is completely silent on the impact of the particle size and particle size distribution of foreign substances - combined in the form of the FSI definition specified in Claim 1 - on the quality and reliability of optical information-storage media comprising a polycarbonate substrate, the subject-matter of present Claim 1 is non-obvious.

- 7.2.1 Document D5, although referring in general terms to the necessity of extremely high purity of the polycarbonate raw material for the achievement of an error-free data retrieval, nowhere mentions the criticality of particulate contaminations and, consequently, D5 is completely silent on the importance of a low FSI value for the achievement of improved and reliable recording and/or reading out characteristics (cf. point 5.3 supra).

Concerning the interpretation of the purity requirements stressed in D5 the Appellant referred to D6, both documents originating from the Opponent, and pointed out that according to Section 2.5 (page 919) of D6 the presence of larger particles in a compact disk should be avoided for purely esthetic reasons only, while, for technical reasons (such) impurities could be tolerated without impairing the quality of the sound (cf. point 5.4 supra).

From that the Appellant justly inferred that it was by no ways clear that the purity criteria referred to by D5 were nearly as strict as those required by present Claim 1.

Document D5 cannot, therefore, give any hint to the skilled person with respect to the solution of the existing technical problem as specified in present Claim 1.

7.2.2 Nor does document D10 contain any relevant information in this respect. This document is essentially concerned with alleviating the different problems of insufficient adhesion of the recording film on the substrate and with the enhancement of the corrosion resistance of the recording film as well as that of the mould, which objectives are met by the solvent extraction of non-particulate impurities, like oligomers, unreacted bisphenol and methylene chloride (cf. point 5.5 supra).

While D10 also mentions that during the manipulation of the polycarbonate raw material the formation and incorporation of dust should be avoided (page 2, lines 34 to 38; page 5, lines 33 to 37; Table 1, Examples 6 to 8, Comparative Examples 11 and 12), it does not suggest that the amount of particulate contaminations, including foreign substances other than dust, should altogether be kept below a certain limit, i.e. the one defined by the FSI value specified in present Claim 1, in order to achieve improved and reliable recording and/or reading out characteristics.

7.2.3 With respect to the requirement of dust-free working conditions document D4 contains similar information as D10 (cf. point 5.2 supra) and its consideration for the assessment of inventive step of the subject-matter of present Claim 1 leads, therefore, to the same conclusion of non-obviousness.

7.2.4 The subject-matter of Claim 1 of the patent in suit is, thus, not obvious over the cited prior art.

7.2.5 The same conclusion applies *a fortiori* to the subject-matter of Claim 2, which relates to an information-storage medium comprising the optical disk substrate according to Claim 1.

8. *Patentability of the subject-matter of Claims 3 to 6*

8.1 Apart from the adaptation of the appendence of these claims, which became necessary by the insertion of the subject-matter of granted Claim 2 into Claim 1 and the consequential deletion of granted Claims 2, 4 and 6, present Claims 2 to 6 are identical to granted Claims 3, 5 and 8 to 10.

8.2 The decision under appeal held (points 6 and 8 of the Reasons [there is no point 7!]) that the subject-matter of these claims was novel and inventive over the cited prior art. This conclusion was not commented upon by the Appellant, nor by the Opponent, who did not reply to the Statement of Grounds for Appeal before abandoning the opposition (cf. point VI supra). In this situation the Board sees no reason to deviate from the finding of the decision under appeal.

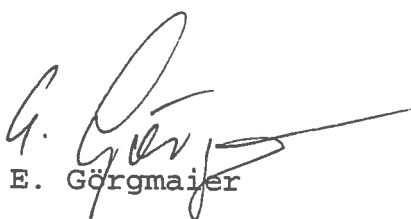
9. The grounds of opposition, thus, do not prejudice the maintenance of the patent in amended form according to Article 102(3) EPC.

Order


For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent on the basis of the set of claims (Claims 1 to 6) submitted at the oral proceedings after any consequential amendment of the description.

The Registrar:


E. Görgmaier

The Chairman:


C. Gérardin

