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D E C I S I O N
of 18 October 2002

Case Number: T 0118/00 - 3.5.2

Application Number: 90118709.6

Publication Number: 0420279

IPC: G11B 7/24

Language of the proceedings: EN

Title of invention:
Optical information recording medium

Patentee:
SONY CORPORATION, et al

Opponent:
(I) Bayer AG Konzernbereich RP Patente und Lizenzen
(II) GENERAL ELECTRIC COMPANY

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Amendments (main and first auxiliary requests) - added
subject-matter by disclaiming undisclosed features (yes)"
"Inventive step (second auxiliary request) - no"

Decisions cited:
G 0001/93, T 0170/87, T 0863/96, T 0323/97

Catchword:
Technical contribution by specifying a new selection
(point 2.5)



Case Number: T 0118/00 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 18 October 2002

Appellants:
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 1 December 1999
revoking European patent No. 0 420 279 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: W. J. L. Wheeler

Members: F. Edlinger
J. H. P. Willems

Summary of Facts and Submissions

- I. The appeal contests the decision of the opposition division revoking European patent No. 0 420 279.
- II. The following documents, which were among the documents considered in the decision under appeal, are relevant for this decision:
- D9: EP-A-0 379 130
- D10: EP-A-0 380 002
- D11: EP-A-0 417 775 and
- D17: English translation of JP-A-1 146 926 filed by opponent I with letter dated 4 May 1998.
- III. Concerning D17, the decision under appeal held that following the teaching of D17, a polycarbonate substrate as specified in claim 1 (directed to an optical information recording medium which comprises such a substrate) of the opposed patent as granted was inevitably obtainable and thus lacked novelty.
- IV. The appellant proprietors filed amended sets of claims and descriptions according to a main and auxiliary request with the statement of grounds of appeal. A second auxiliary request was filed with letter dated 16 March 2001. In preparation for the oral proceedings held before the Board on 18 October 2002, the proprietors submitted a comparative test report with letter dated 18 September 2002.

V. Claim 1 of the main request is worded as follows:

"An optical information recording medium of the type which comprises a substrate and a recording layer formed on the substrate and capable of recording, reproducing or erasing information by optical irradiation, the substrate comprising an injection molded piece of a polycarbonate resin *with the exception of those polycarbonates having been obtained by polycondensation of a bisphenol and phosgene with treatment of the obtained resin with an aqueous caustic soda solution and of those polycarbonates having been obtained by polycondensation of a bisphenol and diphenyl carbonate*, the polycarbonate resin having rather been prepared from an aromatic bisphenol and phosgene with treatment of the reaction solution obtained in the polymerization step with an aqueous ammonia solution or an aqueous solution of ammonia and an alkali and injection molding of the resin at a temperature of not higher than 326°C, the amount of chlorine present as a chloroformate group at terminal ends of the polycarbonate being not greater than 2.0 ppm, and the substrate including a content of free chlorine of less than or equal to 0.2 ppm and a content of halogenated hydrocarbons of less than or equal to 10 ppm."

VI. Claim 1 of the first auxiliary request relates to a process of preparing an optical information recording medium while claim 2 of the first auxiliary request relates to the "use of a substrate comprising an injection molded piece of a polycarbonate resin ... in an optical information recording medium" where the same polycarbonates are disclaimed as in claim 1 of the main request (see the above paragraph V where these features

have been set in italics).

VII. The single claim (in the following "claim 1") of the second auxiliary request is worded as follows:

"A process of preparing an optical information recording medium of the type which comprises a substrate and a recording layer formed on the substrate and capable of recording, reproducing or erasing information by optical irradiation, wherein

an aromatic bisphenol and phosgene are polymerized, the reaction solution obtained in the polymerization step is treated with an aqueous ammonia solution or an aqueous solution of ammonia and an alkali whereupon a non-solvent or poor solvent for the polycarbonate resin is added to the polycarbonate resin solution in an amount that will not cause precipitation, the resultant uniform solution is maintained at a temperature of 45 to 100°C and dropped into or sprayed in water under agitation for gelation, the solvent is distilled off to provide a porous particulate product, followed by separation of water, drying, and drying through extrusion to obtain a polycarbonate resin in which the amount of chlorine present as a chloroformate group at terminal ends of the polycarbonate is not greater than 2.0 ppm, the content of free chlorine is less than or equal to 0.2 ppm and the content of halogenated hydrocarbons is less than or equal to 10 ppm,

the polycarbonate resin so obtained is injection molded at a temperature of from about 280°C to not higher than 326°C to form a substrate, and

a recording layer is formed on the substrate."

VIII. The appellant proprietors requested that the decision under appeal be set aside, and that the patent be maintained in amended form on the basis of:

- claim 1 as filed with the grounds of appeal (main request), or

- claims 1 and 2 of the auxiliary request as filed with the grounds of appeal, or

- claim 1 of the second auxiliary request as filed with the letter of 16 March 2001.

IX. The respondent opponents I and II requested that the appeal be dismissed.

X. The appellant proprietors essentially argued as follows:

Two disclaimers had been introduced in claim 1 of the main request and, identically worded, in claim 2 of the first auxiliary request, to clarify and limit these claims with respect to two different types of prior art disclosure. On the one hand, substrates (comprised, or used, in an optical information recording medium) should be excluded which comprised an injection moulded piece of a polycarbonate resin with no terminal chloroformate groups because the substrates were obtained by polycondensation of a bisphenol and diphenyl carbonate as disclosed in D9 to D11 (prior art under Article 54(3) EPC). On the other hand, also those substrates should be excluded which were obtained by polycondensation of a bisphenol and phosgene with treatment of the obtained resin with an aqueous caustic soda solution alone (a treatment known from D17 to

disintegrate chloroformate groups which were unavoidably present in substrates obtained by this type of process). Although these disclaimers might be considered as superfluous characterisations of what was implicit from the remaining features of the claims, they were helpful as clarifying limitations and did not disadvantage any third party. Moreover, the disclaiming of the treatment with an aqueous caustic soda solution alone also found support in the application as filed because both (caustic soda alone and ammonia) solutions were disclosed as alternative treatments. It should therefore be allowed to restrict the claims by positively specifying one of the disclosed embodiments and excluding the known one. Disclaimers were accepted in the practice of the EPO as an instrument for disclaiming specific prior art and should be allowed in the present case where it made sense to clearly exclude the prior art disclosed in D9 to D11 on the one hand, and D17 on the other hand.

The process of preparing an optical information recording medium in accordance with claim 1 of the second auxiliary request was uncontestedly new. None of the documents disclosed a treatment of the reaction solution obtained in the polymerization step with an aqueous ammonia solution. The only relevant prior art was disclosed in D17 where a 1 to 10% by weight caustic soda solution was used to disintegrate reaction intermediates such as terminal chloroformate groups. However, these polycarbonate resins still contained 2000 ppm (0.2%) by weight or less of the low molecular weight matter. The fact that both caustic soda and ammonia were disclosed in the opposed patent as alternative treatments to remove chloroformate groups at the terminal ends did not mean that they could be

considered as known alternative process steps which led to similar results. The description of the opposed patent (equation (1) on page 4) made clear that the treatment with ammonia proceeded according to a totally different chemical reaction which led to better results (see Table 1 on page 7 of the patent specification) probably because decomposition of the chloroformate group via an aminoformate group was more effective. This improvement was also confirmed by the comparative test reports which showed that the inventive treatment with ammonia was more efficient than that with the caustic soda used in the process of D17 (noticeable reduction in the amount of chloroformate groups and of halogenated hydrocarbons). There was no hint in any prior art document at using ammonia which was a weak base instead of caustic soda which was a strong base. The use of an ammonia solution was not a mere replacement of known alternative aqueous solutions because the effects achieved were not the same. The person skilled in the art thus had no incentive to try ammonia instead of caustic soda.

Injection moulding temperatures within the range as specified in claim 1 of the second auxiliary request were not unusual as such, but served to further distinguish claim 1 from the prior art disclosed in D17. The upper limit of this range helped to keep the number of failures low and was chosen to prevent thermal decomposition of the residual chloroformate groups or chlorinated hydrocarbons which were still contained in the resin. It thus provided a combination effect. Since the lower limit of the range was specified as "from about 280°C", the temperature value of 270°C mentioned on page 7, line 3, of the patent specification was not inconsistent with the claimed

range. Even if one of the distinguishing features (use of ammonia, injection moulding temperature) might have been near at hand, this was certainly not the case for the combination which led to beneficial results.

Concerning the differences in the conditions of the comparative tests to which the opponents referred, they could partly be explained by the fact that the impurities were measured before the extrusion (D17); partly the effects compensated each other (eg a higher temperature for a shorter time) so that they had no major influence. The further differences could not be discussed in the oral proceedings since the opponents had not raised these points before.

XI. The respondent opponents I and II essentially argued as follows:

The disclaimers introduced into claim 1 of the main request and claim 2 of the first auxiliary request should not be allowed. In accordance with established jurisprudence of the EPO, an undisclosed disclaimer for excising a prior art disclosure was only allowable if said disclosure had no relevance for any further examination of the claimed invention and disappeared from the prior art field to be taken into consideration. An undisclosed disclaimer could not be used to remove the objection of lack of inventive step (see eg T 170/87, OJ EPO 1989, 441, and T 863/96). In a more recent decision, the deciding board, after a detailed discussion of the jurisprudence on the admissibility of disclaimers, held that any amendment of a claim which had no support in the application as filed and aimed at distancing the claimed subject-matter further from the state of the art, in

particular by way of a disclaimer, contravened Article 123(2) EPC and was consequently inadmissible (T 323/97, EPO OJ 2002, 476, point 2.5). In the present case, none of the disclaimers had support in the application as filed. The disclosure of an embodiment did not provide support for excluding this particular embodiment from a more general claim because the proprietors had the possibility to restrict the claim to other disclosed embodiments.

The process of claim 1 of the second auxiliary request essentially differed from the prior art disclosed in D17 in that the reaction solution in the polymerization step was treated with (an alkali containing) an aqueous solution of ammonia. The temperature range at which the polycarbonate resin was injection moulded merely constituted an arbitrary selection of a range within which the person skilled in the art would work.

Claim 1 of the second auxiliary request did not specify a concentration level of the ammonia solution. The apparent objective, in view of D17, was to further reduce the amount of chloroformate groups at terminal ends of the polycarbonate resin from which the substrate is formed. It was, however, doubtful whether such an effect was achieved in any of the embodiments of the opposed patent. There was only one embodiment (Example 4, Substrate A; pages 6 and 7 of the patent specification) where ammonia of a specified amount was added to a caustic soda solution and specifications were achieved as set out in claim 1 of the second auxiliary request. It was unlikely that lower concentrations of ammonia (which were also covered by the claim) would be effective to achieve the

specifications set out in claim 1.

The comparative test report submitted by the appellants was not sufficiently close to the examples of D17 and the opposed patent to allow a conclusion to be drawn that any effect could be attributed to the teaching of the opposed patent. There were at least eight differences with respect to Example 4 of the opposed patent and Example 1 of D17. These differences were apparent from a simple comparison applying basic chemistry so that there was no need for raising these points before the oral proceedings (if there had been sufficient time). It was the appellants' duty to justify why the test conditions diverged in several points from those of the opposed patent and D17. For example, in the experiment said to be according to the opposed patent, butylphenol was added after the blowing of phosgene while in the experiment according to D17 it was added before, which is the sequence specified in Example 4 of the opposed patent (page 6, lines 36 to 39). A large amount of methylene chloride was added in the experiment (diverging from the description of the opposed patent), but not in the experiment according to D17. The amount of the active agent (5% ammonia solution) was much higher than in Example 4 of the opposed patent and also higher than the concentration (4% caustic soda solution) chosen for the experiment according to D17 (by contrast with a 10% caustic soda solution disclosed in Example 1 of D17, pages 10 and 11, bridging paragraph). These and further differences (eg drying temperature and time) made it impossible to fairly compare the claimed process with Example 1 of D17. Contrasting with these experiments, opponent I had carried out a comparative test (filed with letter dated 4 May 1998) in the course of the

opposition procedure leading to this appeal which had shown that the treatment with an aqueous caustic soda solution (as in the Example of D17) was more effective than the claimed ammonia treatment.

The use of an aqueous ammonia solution to treat the reaction solution obtained in the polymerization step of D17 merely constituted an obvious alternative step if an improvement in removing terminal chloroformate groups were accepted or not. Ammonia was generally known as a pseudo-alkaline and as a nucleophile. Although it was a weaker base than aqueous caustic soda, the person skilled in the art would have expected a similar reaction in application of a known chemical reaction of ammonia (see equation (1) of the opposed patent) which possibly could bring about an additional effect by nucleophilic reaction. The process of claim 1 of the second auxiliary request thus merely specified an obvious alternative treatment of the reaction solution obtained in the polymerization step without any demonstrable effect which could be attributed to the fact that ammonia was added to the known alkali.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request and first auxiliary request*
 - 2.1 Claim 1 of the main request and claim 2 of the auxiliary request were amended in the appeal proceedings by introducing negative features with the proprietors' declared intention to disclaim two different pieces of prior art (D9 to D11, prior art

under Article 54(3) EPC; D17, prior art under Article 54(2) EPC).

2.2 Claim 1 of the main request and claim 2 of the first auxiliary request both specify an injection moulded piece of a polycarbonate resin having been prepared from an aromatic bisphenol and phosgene with the treatment as specified in the claims, but with the exception of the following polycarbonates:

- (a) polycarbonates having been obtained by polycondensation of a bisphenol and phosgene with treatment of the obtained resin with an aqueous caustic soda solution, and
- (b) polycarbonates having been obtained by polycondensation of a bisphenol and diphenyl carbonate.

2.3 The specification of exceptions (a) and (b) to the polycarbonate resins from which the injection moulded piece of the substrate is prepared constitutes a selection among the previously specified injection moulded pieces of the substrate. It is generally accepted that there is no positive disclosure of disclaimers (a) and (b) in the application as filed, eg in the form of a teaching about a technical effect achieved when the injection moulded piece of the substrate is not made of the specific polycarbonate resins which are now excluded. The application as filed (page 8, last paragraph to page 9, line 27; cf page 4, lines 20 to 38 of the patent specification) discloses two alternative treatments of the reaction solution to reduce the amount of chloroformate groups in the polycarbonate resin, namely a treatment with a sodium

hydroxide solution to remove the low molecular weight components from the resin and, alternatively, a treatment with an aqueous ammonia solution or an aqueous solution of ammonia and an alkali. In Example 4, a sodium hydroxide solution is used in combination with ammonia (cf page 6, lines 42 and 43 of the patent specification).

- 2.4 The proprietors' argument that at least exception (a) found support in the application as filed because both the caustic soda and the ammonia solutions were disclosed as alternative treatments, is not convincing because the alternative treatments are not mutually exclusive and are, in fact, combined in Example 4.
- 2.5 The appellant proprietors have argued that these exceptions were merely limiting and should be allowed as disclaimers because they did not disadvantage any third party. However, since exceptions (a) and (b) constitute undisclosed features which have been introduced by amendments to the application as filed, they would only be allowable under Article 123(2) EPC if they merely excluded protection for part of the claimed invention and did not provide a technical contribution thereto (see G 1/93, EPO OJ 1994, 541, point 16). The features in question are technical because they specify a new selection of an aqueous solution of ammonia and an alkali other than aqueous caustic soda to treat the reaction solution obtained in the polymerization step. This selection, according to the appellant proprietors, is more effective in removing terminal chloroformate groups of polycarbonates obtained by a phosgenation process than that of D17. Even if the same or a less effective treatment were obtainable by this new selection, it

could nevertheless provide a technical contribution concerning the reaction solutions, the reaction conditions, etc, which are involved. Since nothing else in the wording of the claims or the description would justify a construction of these terms of the claims as merely excluding protection for part of the subject-matter of the claimed invention without providing a technical contribution, the exceptions (a) and (b) do not constitute allowable amendments.

- 2.6 The standard practice of allowing disclaimers in order to limit the protection conferred does not apply to cases where the limiting feature could create an inventive selection. While disclaimers had been allowed in some cases to establish novelty against accidental anticipations, they had not been allowed to establish inventive step. This can be seen from points 7 and 16 of the above cited decision G 1/93 of the Enlarged Board of Appeal (*supra*), but also from the decisions cited by the parties (see eg T 323/97, *supra*, point 2.2). According to the appellant proprietors' intention, disclaimer (a) delimits claim 1 of the main request and claim 2 of the first auxiliary request against the closest prior art (see below). This is not allowable according to the established jurisprudence of the boards of appeal. The main request and first auxiliary request thus cannot be accepted.

3. *Second auxiliary request*

- 3.1 It is common ground that D17 represents the closest prior art and discloses a process of preparing an optical information recording medium of the type which comprises a substrate and a recording layer formed on the substrate and capable of recording, reproducing or

erasing information by optical irradiation wherein an aromatic bisphenol and phosgene are polymerized (D17, page 1; page 2, lines 1 to 8; page 12, lines 5 to 12). The parties also agree that the reaction solution obtained in the polymerization step of D17 is treated with an alkali (aqueous caustic soda). Following this treatment, a non-solvent or poor solvent for the polycarbonate resin is added to the polycarbonate resin solution in an amount that will not cause precipitation. The resultant uniform solution is maintained at a temperature of 45 to 100°C and dropped into or sprayed in water under agitation for gelation, the solvent is distilled off to provide a porous particulate product, followed by separation of water, drying, and drying through extrusion to obtain a (injection moulded) polycarbonate resin having a content of halogenated hydrocarbons less than or equal to 10 ppm (D17, pages 3 to 6 and pages 9 to 12). The treatment of the reaction solution with an aqueous caustic soda solution in D17 (see pages 5 and 6, bridging paragraph) is said "to disintegrate the reaction intermediates such as chloroformate and others and the terminal groups as the byproduct with simultaneous extraction of a part of the unreacted bisphenol and the low molecular weight matters". Quantitatively, D17 specifies "10 ppm or less of unreacted bisphenol" (D17, page 6, paragraph 2) and discloses a reduction of low molecular weight matters from a usual range of "0.5 - 5%" (D17, page 3, lines 15 to 24) to "0.2% by weight or less". In Example 1, a value of 0.05% is indicated (D17, page 11, lines 3 and 4 from below).

- 3.2 The subject-matter of claim 1 of the second auxiliary request thus differs from the prior art disclosed

in D17 in that, in accordance with claim 1, the reaction solution obtained in the polymerization step is treated with an aqueous ammonia solution or an aqueous solution of ammonia and an alkali. Moreover, claim 1 specifies that the polycarbonate resin has an amount of chlorine present as a chloroformate group at terminal ends of the polycarbonate which is not greater than 2.0 ppm and the content of free chlorine is less than or equal to 0.2 ppm. Furthermore, the polycarbonate resin so obtained is injection moulded at a temperature of from about 280°C to not higher than 326°C.

- 3.3 The conditions in the comparative tests submitted by the appellants differ in several points from those of Example 4 of the opposed patent and from those of Example 1 of D17 to which it is compared. As pointed out by the opponents, differences in the amount of the active agent (ammonia in the opposed patent and caustic soda in D17) and of methylene chloride, differences in the time sequence of adding butylphenol and the blowing of phosgene and differences in other respects are such that an effect is not convincingly shown to have its origin in the distinguishing process feature of the single embodiment of the claimed invention (Example 4, Substrate A) which has led to a product having the specifications set out in claim 1 of the second auxiliary request. Even less has an effect been demonstrated for adding an unspecified amount of ammonia in the known process step of treating the reaction solution with an aqueous caustic soda solution (D17, pages 10 and 11, bridging paragraph; cf patent specification, page 6, lines 42 and 43). The process of claim 1 of the second auxiliary request, however, covers an unspecified amount of an aqueous ammonia and

an unspecified alkali. The temperature range at which the polycarbonate resin is injection moulded includes usual temperature ranges as acknowledged by the appellant proprietors. The effect of limiting hydrolysis of the polycarbonate resin by selecting a temperature below 326°C (see patent specification, page 5, lines 29 to 34) would thus be achieved by moulding the resin at a usual temperature.

3.4 The problem solved by the above distinguishing features thus has to be seen in providing an alternative process of preparing an optical information recording medium of the known type which has a high long-term stability in a high temperature and humidity environment and a low error rate, by reducing the amount of chloroformate groups existing at terminal ends in the polycarbonate resin (cf D17, pages 2 and 3, bridging paragraph and pages 5 and 6, bridging paragraph; patent specification, page 2, lines 25 to 29 and page 2, line 49 to page 3, line 1; page 4, lines 20 to 35).

3.5 To solve this problem, the person skilled in the art would try known alternative aqueous solutions for which he could expect a similar reaction in the treatment of the reaction solution. Since ammonia was generally known as a pseudo-alkaline and as a nucleophile, an aqueous solution of ammonia was among the alternative solutions which provided a reasonable expectation of success. Its use in the treatment step of claim 1 of the second auxiliary request is thus to be considered as an obvious alternative process step. The mechanisms involved in both alternative treatment steps (caustic soda and ammonia solutions) were described in the opposed patent as decomposing the terminal chloroformate groups and simultaneously extracting the

low molecular weight products, as was also disclosed in D17 for the treatment with a caustic soda solution (D17, pages 5 and 6, bridging paragraph; cf patent specification, page 4, lines 22 to 26). Therefore, the appellant proprietors' argument that the treatment with ammonia proceeded according to a totally different chemical reaction (formula (1) on page 4 of the patent specification) which led to better results cannot be accepted as supporting the presence of an inventive step.

3.6 The further process step which is not disclosed in D17 concerns the temperature range of from about 280°C to not higher than 326°C at which the polycarbonate resin is injection moulded to form a substrate. As set out above, it was not contested that this range includes usual temperature values for injection moulding. The person skilled in the art may thus be expected to work within this normal range. The specification of the temperature range in claim 1 of the second auxiliary request thus does not render the claimed process inventive.

3.7 This is also true for the parameters which are specified in claim 1 for the product obtained by the claimed process. It is not contested that D17 does not disclose the amount of chlorine present as a chloroformate group at terminal ends of the polycarbonate. But D17 (page 3, paragraph 2 from below; page 6, paragraph 2; page 11, lines 3 and 4 from below) does disclose that the content of low molecular weight matters including chloroformate terminal groups is reduced from a range of 0.5 to 5% (in "traditional aromatic polycarbonate resins") to 0.2% by weight or less (0.05% - corresponding to 500 ppm - in Example 1).

A similar relative reduction is disclosed in the opposed patent (page 4, lines 5 to 14 and Table 1 on page 7 of the patent specification) for the amount of terminal chloroformate groups (less than 2 ppm) when compared with that of conventional polycarbonate resins (3 to 10 ppm). This reduction is obtainable both by treating the reaction solution with a 1 to 10% caustic soda solution (as in D17) or, alternatively, with an aqueous solution of ammonia (0.2 kg) and an alkali (80 litres of a 10% caustic soda solution; cf patent specification, page 4, lines 20 to 38; page 6, lines 42 and 43). Similarly, the content of free chlorine (less than or equal to 0.2 ppm) which constitutes an undesired impurity of the product obtainable by the process of the opposed patent cannot be taken as an indication that claim 1 of the second auxiliary request specifies a process which involves a new or improved effect. The chloroformate groups which may decompose to produce free chlorine as the substrate ages (patent specification, page 4, lines 15 to 19) are likewise disintegrated by the known treatment step (see point 3.1 above). Thermal decomposition (patent specification, page 5, lines 19 to 24) would be avoided by working within a normal injection moulding temperature range. Therefore, the same result may be expected to be achieved by the obvious process steps set out in claim 1. No further steps for obtaining a lower content of free chlorine are specified in claim 1. The Board notes that a combination of centrifugal separation and filtration to reduce the content of free chlorine in the substrate (patent specification, page 3, line 50 to page 4, line 4) is likewise mentioned in D17 (page 10, line 5 from below to page 11, line 13).

3.8 Summarising, the process claimed in claim 1 of the second auxiliary request cannot be considered as involving an inventive step in the meaning of Article 56 EPC in that it constitutes an obvious alternative process to that disclosed in D17.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman

D. Sauter

W. J. L. Wheeler