Europäisches Patentamt
Beschwerdekammern

European Patent Office
Boards of Appeal

Office européen des brevets
Chambres de recours

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

Aktenzeichen / Case Number / N° du recours : T 310/88

Anmeldenummer / Filing No / N° de la demande : 81 301 040.2

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 036 301

Bezeichnung der Erfindung: Photosensitive polyamide resin composition
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C08L 77/00

ENTSCHEIDUNG / DECISION

vom / of / du 23 July 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet : Toray Industries, Inc.

Einsprechender / Opponent / Opposant : BASF AG

Stichwort / Headword / Référence : Photosensitive resin/TORAY INDUSTRIES

EPÜ / EPC / CBE Art. 56

Schlagwort / Keyword / Mot clé : "Inventive step (confirmed)"
"Late-filed evidence: not admitted"

Leitsatz / Headnote / Sommaire

Europäisches Patentamt
Beschwerdekammern

European Patent Office
Boards of Appeal

Office européen des brevets
Chambres de recours

Case Number : T 310/88 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 23 July 1990

Appellant : (Opponent)
BASF Aktiengesellschaft
Carl-Bosch-Strasse 38
D-6700 Ludwigshafen

Representative :

Respondent : (Proprietor of the patent)
Toray Industries, Inc.
2, Nihonbashi Muromachi 2-chome
Chuo-ku, Tokyo 103
JP

Representative :
Ellis, John Clifford Holgate
MEWBURN ELLIS & CO.
2/3 Cursitor Street
London EC4A 1BQ
GB

Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 22 March 1988, issued on 17 May 1988, rejecting the opposition filed against European patent No. 0 036 301 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : F. Antony
Members : R. Lunzer
J. Stephens-Ofner

Summary of Facts and Submissions

I. European patent No. 0 036 301 was granted on 30 May 1984 on the basis of application No. 81 301 040.2 filed on 12 March 1981.

II. By a telex dated 28 February 1985, duly confirmed in writing, an opposition was lodged by the present Appellant on the ground of lack of inventive step. (Later, lack of novelty based on one of the cited documents was also argued). The Appellant relied in particular on the following documents:

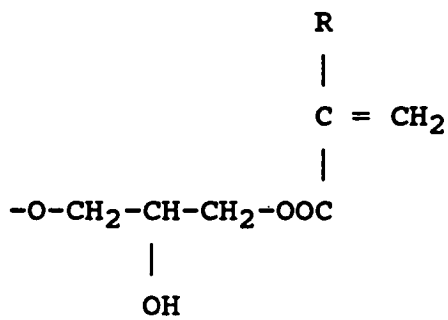
(1) JP-B-72-16 062
(2) JP-B-72-45 583
(3) JP-B-74-23 304
(4) JP-A-75-32 645
(5) JP-A-75-50 104
(6) GB-A-1 241 622

together with two documents cited after expiration of the opposition term.

III. By its decision of 22 March 1988, confirmed in writing on 17 May 1988, the Opposition Division rejected the opposition, holding that the Appellant had failed to make out its case on either of the grounds relied on. Accordingly, the patent was upheld without amendment, the single independent Claim 1 being in the following form:

"A photosensitive polyamide resin composition prepared from at least the following components:

(A) 100 parts by weight of an alcohol-soluble polyamide,
(B) 0.1 to 50 parts by weight of a non-polymeric compound having both vinyl and epoxy groups in the same and one molecule, and
(C) 10 to 200 parts by weight of a polyfunctional vinyl monomer having a molecular weight of lower than 2,000 and at least two linkages represented by the following formula:



wherein R stands for H or CH_3."

In the course of this decision, the letters (A), (B), and (C) are used to refer to components which fall within the above identified classes.

IV. An appeal against the decision of the Opposition Division was lodged on 8 July 1988, the appeal fee was paid on the same day, and the Grounds of Appeal were filed on 26 September 1988. Reference was made to two further documents, viz.

(9) US-A-4 170 481 and
(10) JP-B-74-13442.

V. In the course of its written submissions, the Appellant contended that the alleged invention lacked novelty on two distinct grounds. First, that citation (9) disclosed the

possible combination of components (A), (B), and (C) of Claim 1. Secondly, that carrying out the steps described in document (5), there would inevitably be a reaction of components (A) with (B) and (C), as required by Claim 1 here in issue. Document (5) describes the reaction of (B) (glycidyl methacrylate) with ethylene glycol, to produce the product (C). (C) is then reacted with (A). However, although the citation states that a test had been performed to confirm that (B) had reacted completely to form (C), and was therefore no longer present, in fact the Appellant's experiment repeating Example 1 showed some remaining (B) was in fact still present with (C). Thus in performing the steps disclosed in document (5), (A) would in fact be reacted with both (B) and (C). The experiments provided by the Appellant in the opposition showed residual amounts of (B) amounting to 36.7% and 68.9%, while further experimental results introduced in the appeal showed residual amounts of 28.9% and 22.17%.

VI. As to lack of inventive step, the Appellant argued that the invention was obvious having regard to document (5), which it interpreted as indicated above, and also having regard to the teachings of documents (1), (2), (3), (4) and (6). These it alleged contained various teachings of the reaction of (A) with (B), or (A) with (C), so that it would have been obvious to combine their teachings to the extent of using using (A) in combination with both (B) and (C).

VII. In seeking the rejection of the Appeal, the Respondent (patentee) contended that document (9) was not relevant in that it disclosed no more than lists of possible reactants, in a patent directed to the step of adding ascorbic acid to the photosensitive polymers. Regarding document (5), it contended that due regard had to be given to the teaching to the effect that a test was performed in

order to ensure the absence of (B); accordingly this document could not properly be regarded as a prior teaching of reacting (A) with both (B) and (C).

VIII. Regarding inventiveness, the Respondent contended that document (5) was wholly irrelevant, once it was accepted that it did not affect the issue of novelty, and that similarly the other documents respectively disclosed the reaction of (A) with (C), or (A) with (B), but not one of them disclosed, or even faintly suggested, the reaction of (A) with both (B) and (C). In fact document (4), which like document (5) dealt with the production of (C) through a reaction of (B) with other compounds, made it clear at every stage that the reaction had to go to completion so that no epoxy groups were present, before (A) was reacted with (C) alone.

IX. The Appellant requests that the decision under appeal be set aside, and the patent in suit be revoked. The Respondent requests that the appeal be dismissed.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. In the exercise of its discretion under Article 114(2) EPC, the Board has decided to disregard documents (9) and (10) on the ground that they were not submitted in due time, and are not relevant in the sense that they would have been unlikely to have influenced the first instance's decision. With respect to document (9), which has been relied on in support of an argument of lack of novelty, the Board regards it as irrelevant for the reasons advanced by the Respondent, set out in paragraph VII above.

3. **Novelty**

3.1 Apart from document (9), which is excluded as stated above, the only document relied on in the attack on novelty is document (5). It bears some resemblance to the present invention, relating as it does to a photosensitive composition comprising a polymerisable monomer, which may be a polyamide such as those identified here as component (A), which is reacted with the previously prepared reaction product (C). It does not disclose expressly the possibility of bringing (A) into contact with (B). Not only is that not disclosed, but Example 1 contains the following explicit teaching with regard to making (C) from epoxy group containing component (B):

> "After the reaction, the amount of the residual epoxy group was determined according to direct titration of the alpha-epoxy group. It was found that no epoxy group was left."

Likewise, Example 2 , which was also directed to the production of the reaction product (C), ends with the comment:

> "No residual epoxy group was detected."

3.2 The Appellant's case as to lack of novelty rested on the basis of its purported experimental demonstration that, when Example 1 was repeated, significant amounts of epoxy group remained, and were detected by analysis. Therefore, the performance of Example 4, which involved the reaction of (A) with (C), made according to Example 1, was, so it was argued, in fact a reaction of (A) with both (B) and (C).

3.3 As for the tests reported in document (5), the Appellant sought to interpret the words quoted in point 3 above as a mere observation that the experimental technique then used failed to detect the presence of epoxy groups, albeit that epoxy groups could nonetheless still have been present to a significant extent.

3.4 It is now well established law (cf. Decision T 12/81, "Diastereomers/BAYER" OJ EPO 1982, 296) that if a prior document teaches the performance of certain procedural steps which inevitably lead to a given product, that product can not be novel. However, in the view of the Board, that situation is to be contrasted with the situation seen here. Even assuming, in the Appellant's favour, that the experimental evidence adduced by the Appellant proved an inevitable result, in the above sense, there would not be any sufficiently clear teaching in document (5) such as could deny novelty to a later proposal to react (A) with (B) and (C) for the following reasons:

3.5 The proper interpretation of document (5) is that it observes that there was an absence of (B) from the reaction product (C), before it was reacted with (A). Therefore, if a skilled reader had performed Examples 1 and 2, and he had found (B) still to be present, he could reasonably be expected to have interpreted the observation that, "no epoxy groups were detected", as meaning that he needed to take whatever further process steps were necessary, whether by washing, solvent extraction, or otherwise, to eliminate any residual (B), before going on to react (A) with (C).

3.6 This is particularly so in the circumstances of the present case, because the skilled reader may be expected to observe from the chemical nature of (A) and (B)

respectively, that (B) is capable of reacting with (A). Consequently, he would expect that, if (B) were not eliminated, the reaction of (A) with both (B) and (C) would be likely to produce a different compound from that resulting from reacting (A) with (C) alone.

3.7 Thus, in contrast to the situation covered by Decision T 12/81 (supra), here the true interpretation of the cited document is that the skilled reader, repeating its examples, would not inevitably have reacted (A) with (B) and (C), because the document points away from so doing.

3.8 Accordingly, the Board finds that the objection of lack of novelty is not established.

4. **Closest prior art**

4.1 The Appellant has relied on each of the citations referred to in II above in support of its arguments of lack of inventive step. Documents (1) to (5) inclusive are directed to printing plates, which include as a major component polyamide resins of the kind identified here as component (A). Documents (1), (2) and (3) relate to the reaction products of (A) with (B), while documents (4) and (5) relate to the reaction products of (A) with (C). Although there are thus two groups of citations, as indicated above, each of these five discloses reaction of two of the components, in the absence of the third, in contrast to the alleged invention in which all three must be present. The arguments presented with respect to each of them are similar, and accordingly for the purposes of this decision document (5) alone can be treated as being the closest prior art.

4.2 Document (5) is concerned with photosensitive compositions of the kind used in printing plates. These contain a polymerisable monomer. However, the document teaches that problems had been encountered with the choice of this monomer; cf. (5) page 2, paragraph 2. Those with a relatively high melting point, such as a diamine bisacrylamide, gave rise to undesirable crystallization of the monomer. On the other hand, liquid monomers, such as ethylene glycol diacrylate, or triethylene glycol, suffered from their relatively high volatility, a bad smell was often generated during the step of forming the printing plate and, since this liquid monomer bleeds out of the surface of the plate, a clear sharp printing plate could not be prepared. Accordingly, document (5) proposed the use of a monomer which is obtained by the reaction of a glycol with a glycidyl methacrylate (page 3, paragraph 3), this reaction product being referred to as component (C) in the present decision.

4.3 According to Example 4 of document (5), 200 grams of a copolyamide (component (A)) is reacted with 40 grams of component (C) made according to Example 1 by the reaction of (A) with (B) and a satisfactory photosensitive plate was produced.

5. **The Problem**

5.1 The area to which the patent in suit relates is the production of photosensitive polyamide resins for use in printing plates, and it aims particularly at the production of such plates which have high sensitivity to ultra violet light, as well as good image-reproducing qualities, softness, elasticity, and storage stability. These are the properties which are commonly desired of photosensitive plates. However, as contended by the Respondent, and is to some extent confirmed by the

experimental work submitted by the Appellant with its communication of 18 September 1987, compositions made by reacting (A) with (B) and (C) show significantly greater light sensitivity (exposure time 3.08 sec. compared with 5.0 sec.) than a composition made by the reaction of (A) with (C). Accordingly, starting with document (5) as the closest prior art, the objective problem with which the invention is concerned may be seen as the attainment of superior light sensitivity, without detriment to the other desirable properties.

6. **The Solution**

6.1 In contrast with such photosensitive polyamide compositions known to the prior art, such as from document (5) which involves the reaction of (A) with (C), the alleged invention proposes the inclusion of component (B), being a compound with both vinyl and epoxy groups in one and the same molecule, which has to be present in a composition consisting essentially of (A) and (C). As pointed out at page 7, lines 43 to 50 of the patent in suit, the improved properties of photosensitive resins made in accordance with the invention, notably that good image reproduction can be obtained even by relatively short irradiation with u.v. light, stem from the fact that by reaction of the component (B), which has both epoxy and vinyl groups, with the polyamide component (A), double bonds are introduced into the polyamide. The quantity of (B) may vary within the specified wide range of 0.1 to 50.0%, and it is explained at page 4, lines 41 to 47 that even such a minute amount as 0.1% is in fact effective in bringing about the desired effect.

6.2 As explained in the Respondent's letter of 21 December 1989, when the photosensitive resin is exposed, a three dimensional network structure is formed among the

molecules of the polyfunctional vinyl monomer component (C), as well as the polyamide component (A), which has had vinyl groups introduced into it from component (B). In this manner, the Respondent claims that a photopolymerisable resin composition is obtained which can provide a relief printing material having high image reproducing properties. The Respondent then contrasts the invention with the documents cited as prior art, which do not suggest providing a cross-linked three-dimensional network structure.

6.3 According to the results given in Examples 1 to 4 inclusive, the plates made in accordance with the invention have a desirable combination of light sensitivity, accuracy of image reproduction, and good storage stability. In the Board's view, these Examples show credibly that the presence of (B) in the reaction of (A) with (C) achieves the desired end of attaining printing plates with a desirable balance of properties, including in particular good light sensitivity (page 8, lines 36, 37).

6.4 The Appellant sought to attack the merits of the invention, insofar as the claims cover the use of as little as 0.1% of (B), and to that end filed in the opposition experimental work which purported to show that no useful improvement in light sensitivity could be derived from the presence of (B), unless it were present to a level of 5% or more. In contrast, on appeal the Appellant filed what seemed to the Board to be contradictory experiments, which purported to show that increasing amounts of (B) had a deleterious effect on the light sensitivity of the plates.

6.5 Whether in truth these experimental reports are self-contradictory, as is asserted by the Respondent, or self-consistent, as is asserted by the Appellant, is unimportant. The Board does not regard them as significant, because they fail to show convincingly that improved properties are not obtained by the deliberate inclusion of (B) in the reaction of (A) with (C).

7. **Inventiveness**

7.1 The issue of inventiveness depends on whether a notional skilled worker, seeking to obtain improved photosensitive printing plates possessing a combination of high sensitivity, coupled with good image reproducing capability, softness, and elasticity, and having document (5) as a starting point, would have foreseen the advantage of including product (B) in the reaction of (A) with (C). In the Board's view, document (5) provides no pointer in that direction. In fact, the specific teaching that a test was carried out to see that (B) was absent is seen by the Board as an indication in the opposite direction.

7.2 Although each of the other citations (1), (2) and (3) discloses the combination of (A) with (B), without mentioning (C) at all, and document (4), in common with document (5), is concerned with the reaction (A) with (C), without mentioning (B), none of these documents contains any pointer towards having all of (A), (B), and (C) present, so that they can react with each other. In document (4), the main claim speaks of "reacting a linear synthetic polyamide resin with the reaction product produced by ... the reaction of all (emphasis added) the epoxy groups with the unsaturated monobasic acid." Like document (5), this citation also points away from carrying out any reaction of (A) with both (B) and (C).

7.3 Having regard to these facts, the Board does not consider that it would have been obvious to the notional skilled worker in the light of the problem to be solved, to proceed from the closest cited prior art, document (5), to the invention here claimed, even taking the other citations into consideration.

8. **Conclusion**

8.1 Accordingly, the Board has reached the conclusion that the subject matter of Claim 1 of the patent in issue is novel and involves an inventive step as required by Articles 54 and 56 EPC, and the claim is therefore patentable. The same applies to Claims 2 and 10 inclusive, which relate to further modifications of the photosensitive composition falling within the scope of Claim 1.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Beer F. Antony

04276