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D E C I S I O N
of 11 April 2006

Case Number: T 0882/03 - 3.3.09

Application Number: 94301755.8

Publication Number: 0620245

IPC: C08J 5/18

Language of the proceedings: EN

Title of invention:
Polyester film

Applicant:
Dupont Teijin Films U.S. Limited Partnership

Opponent:
Mitsubishi Polyester Film GmbH

Headword:
Polyester film/DUPONT TEIJIN FILMS U.S. LIMITED PARTNERSHIP

Relevant legal provisions:
EPC Art. 83, 56

Keyword:
"Sufficiency of disclosure - yes: lack of precision on the limits of protection does not put sufficiency into question"
"Inventive step - no: obvious measure in order to achieve a foreseeable effect"

Decisions cited:
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Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0882/03 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 11 April 2006

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 12 June 2003 rejecting the opposition filed against European patent No. 0620245 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: P. Kitzmantel
Members: J. Riolo
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. European patent No. 0 620 245 based on application No. 94 301 755.8 was granted on the basis of 10 claims.

Independent Claims 1 and 10 as granted read as follows:

"1. A polyester film comprising a polyester having an intrinsic viscosity (IV), measured by solution viscometry using a 1% by weight solution of polyester in o-chlorophenol at 25°C, in the range from 0.65 to 0.8, and an effective amount of an antioxidant, the polyester having an endothermic high temperature peak (melting process) at a temperature of (A)°C and an endothermic low temperature peak (melting process) at a temperature of (B)°C, both peaks being measured by differential scanning calorimetry (DSC) as herein described, wherein the value of (A - B) is in the range from 25°C to 50°C."

"10. A use of a polyester film as an electrical insulator, the polyester film comprising a polyester having an intrinsic viscosity (IV), measured by solution viscometry using a 1% by weight solution of polyester in o-chlorophenol at 25°C, in the range from 0.65 to 0.8, and an effective amount of an antioxidant, the polyester having an endothermic high temperature peak (melting process) at a temperature of (A)°C and an endothermic low temperature peak (melting process) at a temperature of (B)°C, both peaks being measured by differential scanning calorimetry (DSC) as herein described, wherein the value of (A - B) is in the range from 25°C to 50°C."

II. The patent was opposed under Article 100(a) EPC for lack of inventive step and under Article 100(b) EPC for insufficiency of disclosure.

The following documents *inter alia* were cited during the proceedings:

(1) Two documents entitled "Competitors' Film Data Summary" bearing the indication "Received: 08.90" and "Received: 12.91", respectively
(8a) Invoice (English translation from Japanese original) from Diafoil Corporation (Tokio) to Mitsubishi Trading Corporation dated 8 May 1990
(4) G. Capocci et al., "Stabilizer Considerations for Engineering Polymers and Alloys", Antec '88, pp 1016-1020
(5) English translation of Japanese application JP-A-4-275340
(6) H. Zimmermann, "Degradation and Stabilisation of Polyesters", Dev.Pol.Degrad. 1984, 5, pp 79-119
(15) US 3 432 591

III. In its reasons for the decision under appeal, the Opposition Division found that the set of claims of the patent as granted met the requirements of the EPC. It accordingly rejected the opposition under Article 102(2) EPC.

As to the objection relating to insufficiency of disclosure, the Opposition Division was of the opinion that the skilled person would know from its basic general knowledge which is the best and usual method to determine the intrinsic viscosity of a polymer solution, namely the "zero extrapolation method", so

that the information given in the contested patent to that end was sufficient to carry out the measurement of the intrinsic viscosity of the polyesters used according to the patent in suit independently of the fact that different measurement methods might exist.

Concerning the objection of inventive step, it first considered the submissions made with respect to the prior use based on the alleged public availability of the product Diafoil UXO1 film.

In that respect, it considered that the documents on file did not establish that the alleged prior art product Diafoil UXO1 sold according to document (8a) was the same as the ones analysed in document (1).

It moreover maintained that, as Mitsubishi Trading Corporation (ie the buyer) and Diafoil Corporation (ie the seller) belonged to the same industrial group, a tacit agreement of confidentiality could not be ruled out.

Accordingly, the Opposition Division concluded that an inventive step attack could not be based on this product because there was serious doubt that a polyester film having the physical properties of Claim 1 of the contested patent was freely available to the public before the priority date of the patent in suit.

As regards the second line of arguments provided by the opponent having regard to document (5), the Opposition Division reached the same conclusion.

In fact, it defined the problem to be solved vis-à-vis document (5) as the provision of a polyester film with improved thermal ageing and delamination properties.

In its view, as demonstrated by the comparative examples of the description, this problem was solved by the selection of the specific intrinsic viscosity and DSC ranges as defined in Claim 1 of the contested patent.

Although the broad ranges disclosed in document (5) encompassed these particular ranges, the Opposition Division held that the subject-matter of Claim 1 represented a selection vis-à-vis document (5), since this document did not suggest any beneficial effect with respect to thermal ageing and delamination occurring within the two selected ranges.

IV. The appellant lodged an appeal against the said decision.

V. Oral proceedings were held before the Board on 11 April 2006.

VI. During the appeal procedure, the appellant essentially argued that, as the patent in suit indicated (only) a single polymer concentration for determining the intrinsic viscosity, it was clearly the "one-point-method" which was foreseen; even more so as the "zero extrapolation method" was concentration independent and did not require therefore the indication of the sample concentration.

Since there existed several methods for carrying out the calculation of the intrinsic viscosity when using the "one-point-method" and since the results depended on the calculation method employed, the appellant expressed the view that the patent in suit, which did not indicate any calculation method, did not fulfil the requirements of Article 83 EPC.

As regards inventive step, it mainly repeated its argument that prior public use was established by the sale on 26 April 1990 of the product Diafoil UX01 to the company "Mitsubishi Trading Company", which was an independent company not bound to "Diafoil" by any obligation of confidentiality.

In order to further emphasise the public character of the sales of the product Diafoil UX01, the appellant submitted new evidence, ie an invoice dated 1 May 1989 to the fully independent company "Singapore Sanyo Compressor" concerning the purchase of several hundred kilos of the UX01 film product.

It also maintained its inventive step objection vis-à-vis document (5).

In its view, starting from the example of document (5), wherein a polyester polymer (polyethylene terephthalate) film having an intrinsic viscosity of 0.62 was described, the only missing teaching in the disclosure of this document was the use of a polymer having an increased intrinsic viscosity.

It contended that this measure was however obvious in the light of document (15), which showed that the

delamination grade of a film could be diminished by increasing the intrinsic viscosity of the polymer.

VII. In its written and oral submissions the respondent primarily argued that, as the skilled person was well aware that the single-point methods were only approximate mathematical models, he would never consider them as a genuine replacement for the fundamental method of extrapolation from several data points to zero concentration, which was therefore the method it would use in the present case independently of the indication of the specific polymer concentration of 1% which was only meant to identify the level of dilution to be used for the viscosity measurement.

Moreover, the respondent expressed the opinion that as "Mitsubishi Corporation" and "Diafoil Corporation" belonged to the umbrella entity "Mitsubishi Companies", an agreement of confidentiality could not be ruled out, as stated by the Opposition Division.

Concerning in particular the newly submitted invoice to "Singapore Sanyo Compressor" the respondent argued that, even if a sale of Diafoil UX01 was thereby established, the properties of these films remained unknown as they could not be correlated for certain with the analysed sample 08/90 UX01 according to document (1).

Thus, in its view, the alleged prior public use of Diafoil UX01 films was not established.

These films, which were anyway different from the films according to the patent in suit by the absence of an

antioxidant, were therefore unsuitable as a starting point for the assessment of inventive step.

Document (5) was not considered a relevant starting point either because there was no appreciation therein of the significance of the DSC and viscosity parameters.

Nor was the newly submitted document (15) relevant to that end, since the viscosity values disclosed therein were made under incomparable conditions.

The respondent moreover emphasised the fact that the invention lay in the combination of the three features recited in Claim 1 in order to solve the two fold problem of the contested patent, namely improved thermal ageing and delamination properties.

With its letter dated 3 April 2006, the respondent filed further submissions including comparative data in order to demonstrate that the thermal ageing performance of the antioxidant-containing films according to the patent in suit were clearly superior to comparable commercially available films.

VIII. The appellant requested that the decision under appeal be set aside and that European patent No. 0 620 245 be revoked.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Sufficiency of disclosure*

2.1 According to granted Claim 1 the polyester polymer has an intrinsic viscosity (IV) in the range from 0.65 to 0.8. Furthermore, the claim recites that this intrinsic viscosity is measured by solution viscometry using a 1% by weight solution of polyester in o-chlorophenol at 25°C.

2.2 The respondent's objection under Article 100(b) EPC was based on the argument that the method of measurement of the intrinsic viscosity was not indicated with sufficient precision.

2.3 Hence, it has to be decided whether or not the measurement of the parameters relating to intrinsic viscosity were disclosed in the patent in suit in a manner sufficiently clear and complete to enable a person skilled in the art to carry out the claimed invention.

It is common ground that, the fundamental method of determining intrinsic viscosity consists in taking a series of viscosity measurements at different dilute polymer concentrations followed by extrapolation to zero concentration. Beside this method, there exists also the "one-point method", according to which a single viscosity measurement is converted into an intrinsic viscosity value with the help of a

mathematical model adapted to the type of polymer involved.

2.4 Although Claim 1 requires the polymers to have a certain intrinsic viscosity, it fails to specify the precise method by which this parameter should be determined. It was undisputed that a person skilled in the art would, in principle, be able to determine the intrinsic viscosity of a polymer. However, according to the respondent, there was uncertainty which of the two methods was to be used, the "zero extrapolation method" or the "one-point method".

Moreover, since the various mathematical models for calculating the intrinsic viscosity by the "one-point method" which were available at the priority date of the patent in suit led to different results, as could be seen from the data provided by the respondent in its letter dated 29 July 2004 (table on page 2), a third party would not be put in the position to know when it was working within the area forbidden by Claim 1.

2.5 According to the patent in suit (page 4, lines 31 and 32, Claim 1), the intrinsic viscosity is measured by solution viscometry using a 1% by weight solution of polyester in o-chlorophenol at 25°C. The Board agrees with the appellant that the reference in the patent in suit to only a single polymer concentration for the determination of the intrinsic viscosity of the polymers may be interpreted by the person skilled in the art to relate to the "one-point method" .

The Board also agrees with the appellant that the designation "one-point method" is not exhaustive, but

in order to be so must be supplemented by the indication of the calculation model employed.

However, in the light of the data provided by the appellant itself, the results obtained show only minor variations depending on the calculation model used. Thus, according to the table on page 2 of the appellant's letter of 29 July 2004, only a difference of at most 0.018 arises from the different calculation models (see comparison between Billmeyer model and Schulz-Blaschke model for a concentration of 0.75 g/dl: 0,663 vs 0,681).

2.6 It is therefore clear from the above that the lack of an indication of the exact mathematical model to be used for converting a single point viscosity measurement into an intrinsic viscosity value leaves some doubt when it comes to the limits of the specified viscosity range. However, in the Board's judgment, this deficiency rather concerns the reliability of the values obtained and not the impossibility for the skilled person to determine the intrinsic viscosity. Slightly varying results obtained when using different mathematical models for the calculation of the intrinsic viscosity do not disable a person skilled in the art to carry out the invention but are rather related to the question of whether **the matter for which protection** is sought is sufficiently defined in accordance with Article 84 EPC.

The same conclusion is arrived at on the basis of the assumption that the viscosity measurement method to be used according to Claim 1 was the "zero extrapolation method" (as held by the Opposition Division) because,

as can also be inferred from the afore-mentioned table in the respondent's letter of 29 July 2004, the results obtained by this method do not substantially differ from those obtained by the various "one-point methods".

Since lack of compliance with the requirements of Article 84 EPC is not a ground of opposition, the Board has no power to decide on this issue in view of the fact that the claims as granted remain unamended.

Under these circumstances, the Board concludes that the appellant failed to demonstrate that the patent does not fulfil the requirements of Article 100(b) EPC.

3. *Article 56 EPC*

3.1 Document (5) exemplifies polyester films prepared from homopolymer chips of polyethylene terephthalate having an intrinsic viscosity (IV), measured by solution viscometry using a 1% by weight solution of polyester in o-chlorophenol at 25°C, of 0,62. According to the general descriptionof this document, the intrinsic viscosity of the polymer resins is more preferably in the range of from 0.5 to 1.0 (paragraph [0027] examples and page 4, last sentence of the first paragraph).

Moreover, the exemplified polyester has an endothermic high temperature peak (melting process) at a temperature of 259°C and (dependent on the heat treatment of the films) an endothermic low temperature peak (melting process) at a temperature of TP1 between 221°C and 229°C, both peaks being measured by differential scanning calorimetry (DSC). The difference between these two temperature values (259°C minus TP1)

is thus always squarely in the range from 25°C to 50°C required by present Claim 1: in particular, it is 30°C for comparative example 1; 32°C for examples 1 to 7 and comparative examples 2 and 3; and 38°C for example 8 (see table 2 on page 13).

Thus, the only missing feature in the examples of document (5) vis-à-vis the subject-matter of Claim 1 of the patent in suit resides in the presence of "an effective amount of an antioxidant".

The specific objective of document (5) is to provide polyester films which are excellent in planarity after high-temperature processing (page 2, paragraph 3).

As compared thereto, the patent in suit is concerned with the problem of providing polyester films possessing improved thermal ageing which are not susceptible to in-plane delamination (page 2, lines 10 to 12 and 25, 26).

According to the evidence present in the patent in suit, the addition of antioxidants leads to an improvement in thermal ageing while the feature concerning the DSC (A-B) values being within the range from 25°C to 50°C is linked with maintaining these thermal ageing properties without detrimentally affecting the in-plane delamination properties of the film (page 3, lines 27 to 36; tables 1 and 2).

3.2 Document (5), which discloses a polyester having the same features as the ones of Claim 1 of the contested patent, the feature of the DSC (A-B) values being within the range from 25°C to 50°C inclusive, for the

preparation of films which are also subjected to thermal treatment, can be regarded as the closest state of the art.

In the light of the above, the objective problem to be solved by the claimed subject-matter vis-à-vis document (5) can be defined as the provision of a polyester film having improved thermal ageing. This problem is to be solved by the polyester film of Claim 1 of the contested patent containing an effective amount of an antioxidant.

The aspect of the problem set out in the patent specification concerning the achievement of good in-plane delamination properties of the film is not to be considered as part of the objective problem, because this problem aspect is only related to the feature that the DSC (A-B) values are within the range from 25°C to 50°C, a characteristic that is however not distinguishing the claimed invention over the disclosure of document (5).

In view of the working examples disclosed in the patent in suit, the Board is satisfied that the above specified objective problem has effectively been solved.

The question to be answered with regard to inventive step is thus whether the proposed solution, namely the addition of an effective amount of an antioxidant, is obvious to the skilled person faced with the problem defined above in the light of the prior art.

In that respect, the Board observes that in its general description document (5) already foresees the addition of an antioxidant (page 5, paragraph [0007]).

As it is common general knowledge that antioxidants have the effect of thermally stabilising polymers, polyethylene terephthalate inclusive, during processing and use (see for instance (4), page 1017, left-hand column, lines 36 to 60), it can only be concluded that the solution according to Claim 1 of the patent in suit can be derived in an obvious manner from the closest prior art in combination with common general knowledge.

Accordingly, the subject-matter of Claim 1 does not involve an inventive step.

3.3 For the reasons to follow, the above conclusion of obviousness is not invalidated by the respondent's arguments.

3.3.1 The respondent contended that the claimed solution was non obvious because there was a technical prejudice against the addition of an antioxidant.

The Board does not share this opinion. Indeed, it is clear from document (5) itself and from the general teaching in the review document (4), for instance, that there was no such opinion widely or universally held by experts in the field at the filing date of the patent application. The respondent's reliance on a passage in document (6) pointing to problems associated with the presence of antioxidants during the polycondensation reaction is to no avail in this respect, since this is

not the situation in the present case where the antioxidant is mixed into the polymer composition.

The Board considers therefore that the respondent, who has the burden of proving its allegation, has failed to establish that there was indeed a technical prejudice against the addition of antioxidants to polyester polymers.

3.3.2 Concerning the respondent's further submission that document (5) would not be considered by the skilled person because it did not deal either with the problem of thermal ageing or with the problem of in-plane delamination, and that it also did not relate to electrical insulators, the Board observes, firstly, that Claim 1 of the contested patent is not restricted to electrical insulators and, secondly, that document (5) also concerns polymers subjected to thermal treatments, in particular high temperature processing (page 2, paragraph 3).
Document (5) is therefore a document, which would, in fact, be of interest to the skilled person dealing with problems linked to thermal ageing.

3.3.3 As to the question whether the intrinsic viscosity disclosed in the examples of document (5), namely 0,62, for the homopolymer chips (with the consequence that the films will exhibit a lower IV) can be regarded as a distinguishing feature over Claim 1, the Board concludes that, in view of the lack of precision problem associated with the limits of the IV range according to Claim 1 of the patent in suit (see point 2.6 above), this feature cannot be accorded the status of a distinguishing feature.

This conclusion is *inter alia* based on the data provided by the appellant (see point 2.8 above), according to which the lower limit of the intrinsic viscosity of 0,65 given in Claim 1 can in fact vary between at least 0,632 and 0,668 depending on the calculation method employed. Since, accordingly, the value of 0,62 disclosed in document (5) is also subject to similar variations, ie when applying the same degree of "accuracy" between at least 0,602 and 0,638, there is an overlap of these two ranges which makes them undistinguishable.

In that respect, the respondent contended that the value of 0,62 given in document (5) concerned the homopolymer chips and that the intrinsic viscosity for the polymer film itself would be lower. The appellant did not contest these findings. It stated however that the intrinsic viscosity would only be slightly decreased in the final polymer.

Accordingly, in the absence of any concrete data, the Board cannot follow the respondent's argument.

Moreover, in view of the available evidence, which does not associate the intrinsic viscosity range of 0,65 to 0.80 given in Claim 1 with any new element, this range could in any case not be considered as a purposeful selection over the preferred range disclosed in document (5), namely 0,5 to 1 (page 4, last sentence of paragraph [0004]), since the said "inventive" IV range falls squarely within and covers more than 50% of the latter range.

3.3.4 During the oral proceedings, the respondent referred also to its submissions in points 20 to 23 of its letter dated 15 March 2004, according to which the invention lay in the combination of the three features given in Claim 1, namely an intrinsic viscosity within a specific range, a DSC value for (A-B) within a specific range and the presence of an antioxidant, in order to solve a two fold problem, namely improving both the thermal ageing and the delamination properties.

In that respect, the Board observes that the patent in suit is totally silent about this particular definition of the invention and that there is also no experimental evidence on file concerning a correlation of the alleged two fold effect with the particular combination put forward by the respondent. This deficiency is particularly conspicuous when considering the absence of any substantiation concerning a correlation of the delamination resistance with (i) the absence of an antioxidant and (ii) an intrinsic viscosity outside the claimed range.

Accordingly, the problem objectively to be solved by the patent in suit and the Board's conclusions remain unchanged (see point 3.2 above).

3.3.5 The comparative examples filed by the respondent one week before the oral proceedings were not addressed during the oral proceedings by the parties, so that their admissibility into the proceedings was not discussed.

In any case, as the comparative data were provided in order to demonstrate that the thermal ageing

performance of the antioxidant-containing films according to the patent in suit was clearly superior to prior art films without antioxidants, they would not change the Board's conclusions since the measure taken to that end (ie the addition of an antioxidant) is anyway considered obvious to the skilled person (see point 3.2 above).

3.3.6 Under these circumstances, the Board concludes that the ground of opposition under Article 100(a) EPC, namely that of lack of inventive step, prejudices the maintenance of the patent as granted.

Accordingly, there is no need to consider the objection of inventive step in regard to the alleged prior public use.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

G. Röhn P. Kitzmantel