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**Datasheet for the decision
of 22 March 2021**

Case Number: T 2372/16 - 3.3.06

Application Number: 08833075.8

Publication Number: 2195161

IPC: B32B27/00, B32B27/32

Language of the proceedings: EN

Title of invention:

BIAXIALLY ORIENTED POLYPROPYLENE FILM WITH HIGH HEAT SEAL
STRENGTH

Patent Proprietor:

Toray, Plastics (America), Inc.

Opponent:

Treofan Germany GmbH & Co. KG

Headword:

Toray/seal strength

Relevant legal provisions:

EPC Art. 54, 56, 123(2)

Keyword:

Novelty - Parametrical feature derived from a second document
Inventive step - closest prior art - (yes)

Decisions cited:

Catchword:



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Case Number: T 2372/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 22 March 2021

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
10 August 2016 maintaining European Patent
No. 2195161 in amended form.**

Composition of the Board:

Chairman J.-M. Schwaller
Members: S. Arrojo
C. Brandt

Summary of Facts and Submissions

I. The appeals from the patentee and the opponent lie from the decision of the opposition division **to maintain European patent Nr. 2 195 161 on the basis of auxiliary request 1** filed during oral proceedings on 24 June 2016.

II. With its grounds of appeal the patentee requested to set aside the above decision and to maintain the patent as granted, claim 1 thereof **(now main request)** reading as follows:

"A film comprising: a heat sealable skin layer comprising one or more heat sealant resins; and a core layer comprising crystalline propylene homopolymer, 5-15 wt% thermoplastic elastomer, plastomer, or blends thereof, which exhibit an isothermal crystallization temperature of 60°C or less."

III. With its grounds of appeal the opponent requested to set aside the above decision and to revoke the patent, its claimed subject-matter infringing Articles 123(2), 54 and 56 EPC. In particular it invoked lack of novelty and inventive step in view of document D2 (WO 2004/060670 A1).

IV. In reply thereto, the patentee requested auxiliarily that the opponent's appeal be dismissed and that the patent be maintained on the basis of auxiliary request 1 filed during oral proceedings on 24 June 2016, with claim 1 thereof reading as follows:

"1. A film comprising: a heat sealable skin layer comprising one or more heat sealant resins; and a core

layer comprising crystalline propylene homopolymer and 5-15 wt% metallocene-catalyzed ethylene-propylene-based thermoplastic elastomer, which exhibits an isothermal crystallization temperature of 60°C or less."

Further auxiliarily, it requested to maintain the patent on the basis of one of auxiliary requests 2 to 4 filed with letter dated 24 May 2016.

V. In its preliminary opinion, the board held the main request to lack novelty over document D2 (interpreted in the light of D12 (data-sheet "EXACT 8203®")) but that auxiliary request 1 appeared to meet the requirements of the EPC.

VI. The final requests of the parties - at the oral proceedings held on 22 March 2021 - were as follows:

The patentee/appellant requested to set aside the decision and to maintain the patent as granted (main request) or, auxiliarily, to dismiss the opponent's appeal and to maintain the patent on the basis of one of auxiliary request 1 filed during oral proceedings on 24 June 2016, or of auxiliary requests 2-4 filed with letter dated 24 May 2016.

The opponent/appellant requested to set aside the decision and to revoke the patent in its entirety.

Reasons for the Decision

1. Main request - Novelty

The opposition ground under Article 100(a) EPC in connection with Article 54 EPC prejudices the

maintenance of the patent as granted for the following reasons:

- 1.1 Document D2 discloses (example 2) a film comprising a heat sealable skin layer and a core layer comprising a polypropylene homopolymer and 10 wt% of a commercial ethylene plastomer known as "EXACT 8203®". According to document D12 (DSC curve on page 3), the isothermal crystallisation temperature of this plastomer is about 55°C (i.e. lower than 60°C).

- 1.2 The patent proprietor argued that example 2 of D2 did not clearly and unambiguously disclose that the isothermal crystallisation temperature of the polymer "EXACT 8203®" was 60°C or less because the latter had been discontinued some time after 2002 (the publication date of the data-sheet D12). The product was therefore not available on the priority date of the patent (i.e. 2007), or even by the time document D2 was published (i.e. 2004). Said example of D2 was therefore not an enabling disclosure, that is, it could not be considered as state of the art under Article 54(2) EPC.

Furthermore the DSC curve on the third page of D12 was not part of the data-sheet (i.e. first two pages) but had been added by the opponent. Besides the vague indication that this DSC curve had been obtained from Exxon Mobil (the manufacturer of "EXACT 8203®"), no information had been provided as to the specific source of the information, when it was received or how it had been obtained. In the absence of this information and in view of the fact that "EXACT 8203®" had been discontinued and could thus not be tested, there was no way for the opponent to contest the information in the DSC curve, so this curve should be treated as data which was only in the sphere of the opponent.

Consequently, this evidence had to be assessed following the strict standard "up to the hilt", particularly considering that it could lead to the revocation of the patent.

The information derivable from the DSC curve on the third page of D12 was moreover incompatible with the data on the first two pages of D12. In particular, the DSC heat of fusion of "EXACT 8203®" was said to be 100 J/g on the first page, whereas from the calculations performed on the DSC curve, the heat of fusion would be 37,5 J/g. In view of this discrepancy, it was clear that said curve was erroneous and could not be relied upon to estimate the isothermal crystallisation temperature of "EXACT 8203®".

- 1.3 The board does not agree with the above arguments for the following reasons:
 - 1.3.1 For a disclosure to be enabling, the relevant subject-matter has to be reproducible at least at the time this disclosure was made available to the public. There is no evidence to support the argument that the polymer "EXACT 8203®" was not available by the time document D2 was published (only 2 years after the publication date of data-sheet D12). Moreover, whether this polymer was available or not by the priority date of the patent at issue is irrelevant for the question of novelty, because the state of the art under Article 54(2) EPC encompasses anything made available to the public before the date of filing or priority date of the application/patent (i.e. there is no requirement that the relevant disclosure be enabling for the entire period up to the filing/priority date).

1.3.2 The opponent has indicated that the DSC curve in D12 corresponds to the polymer "EXACT 8203®" and has submitted the essential information that the measurements were performed at 10K/min, and that the source of the information was the original manufacturer of "EXACT 8203®" (i.e. Exxon Mobil). Despite the discontinuation of this polymer, the patent proprietor was not prevented from following the same path as the opponent, that is researching the relevant properties of the polymer by requesting this information from the original manufacturer. Since the patent proprietor does not appear to have made any such attempt and since Exxon Mobil, which is not a party to these proceedings, had no apparent reason to withhold information concerning the properties of a discontinued polymer, the board has concluded that the data in the DSC curve of D12 were equally accessible for both parties. Therefore, the assessment of these data should be performed following a balance of probabilities approach.

1.3.3 There are several indicators that the DSC curve in D12 corresponds to the polymer "EXACT 8203®": the legend on the curve refers to this polymer and even indicates a specific lot number of the product; additionally, the melting point according to the DSC curve (73.37°C) is very close to the value (72°C) disclosed in the data-sheets D2b and D12.

The patentee is nonetheless right in pointing out that the observed difference in the heat of fusion between the data sheets for "EXACT 8203®" (100 J/g) and the DSC curve in D12 (37,5 J/g) could call this correspondence into question. In the board's opinion, this divergence could be attributed to an error in the selection of the

polymer (as argued by the patentee) or else to inaccuracies concerning the measuring method.

In this respect, as indicated by the opponent, it is known in the underlying technical field that the heat of fusion calculated from a DSC curve is significantly affected by the degree of crystallinity of the polymer, which in turn depends on the thermal history of each sample. This is reflected in the standard measuring method for the heat of fusion (ASTM 3418 used in D12), which, to avoid this problem, includes conditioning steps for erasing the thermal history of the samples.

In view of the above, applying a balance of probabilities approach, the board considers that the divergence in the heat of fusion is more likely explained by inaccuracies in the measuring method of the sample (i.e. non-conditioning of the sample) than by an erroneous selection of the polymer. Consequently, the board concludes that the DSC curve in D12 corresponds to the polymer "EXACT 8203®".

- 1.3.4 While it could be argued that the inaccuracies in the measuring of the sample in the DSC curve of D12 renders the estimation of the isothermal crystallisation temperature unreliable or at least inexact, the board notes that the subject-matter of claim 1 does not specify how the isothermal crystallisation temperature should be measured. The scope of protection therefore encompasses all (technically reasonable) measuring methods for the isothermal crystallisation temperature of the polymer, including measurements performed on non pre-conditioned samples. Consequently, the isothermal crystallisation temperature of 55,63°C for the polymer "EXACT 8203®" according to the DSC curve in D12 is considered to clearly and unambiguously anticipate the

feature "*isothermal crystallization temperature of 60°C or less*" as defined in claim 1.

1.3.5 The subject-matter of claim 1 is therefore not novel in view of example 2 of D2 in the light of the DSC curve in document D12.

2. Auxiliary request 1 - Amendments

For the board the requirements of Article 123(2) EPC are met for the following reasons:

2.1 Claim 1 as filed has been amended by restricting the original feature "*... 5-15 wt% thermoplastic elastomer, plastomer, or blends thereof ...*" to "*... 5-15 wt% metallocene-catalyzed ethylene-propylene-based thermoplastic elastomer ...*".

2.2 The opponent argued that none of the paragraphs referring to metallocene-catalysed ethylene-propylene based products provided the combination of features defined in claim 1. In particular, the passage on page 18, lines 5-13 of the description as filed did not indicate that the ethylene-propylene-based elastomer had a concentration of 5-15 wt%. It was also unclear which of the crystallisation temperatures in this passage (i.e. 48°C and 30°C) referred to the ethylene-propylene elastomer.

Furthermore the amendment represented an arbitrary selection of one of the options from the list on page 6, lines 12-16 of the description as filed. There was no specific hint for this selection and, in fact, the selected alternative represented the most disadvantageous or less preferred one in view of the results in table 1 (page 29 of the description as

filed), because example 5 (the only one falling within the scope of claim 1) had the lowest heat seal strength among all the examples of the patent.

2.3 The board disagrees with the above argumentation for the following reasons:

- The passages on page 6, lines 12-16 and on page 18, lines 5-13 as filed disclose preferred forms of the feature "*thermoplastic elastomer, plastomer, or blends thereof*" defined in claim 1 as filed. Since this claim already defined a concentration of 5-15 wt% of this/these copolymer/s, it is apparent that this originally defined amount implicitly applies to any preferred form of the copolymer in the core layer.

- The temperatures of 48°C and 30°C on page 18, lines 5-13 as filed are simply used to indicate that the specific polymers described therein fall within the required isothermal crystallisation temperature range of 60°C or lower. Whether the temperatures correspond to one polymer or the other is therefore irrelevant for the assessment of Article 123(2) EPC.

- It is jurisprudence of the boards that a single selection from a list of alternatives disclosed in the application as filed does not violate Article 123(2) EPC. Whether the selection corresponds to the most advantageous or to a less advantageous alternative is irrelevant, as long as all the alternatives are originally contemplated as possible fall-back positions. In the present case, there is no doubt that the selected copolymer was considered as a possible fall-back position for the invention, because one of the examples in the application as filed (example 5) corresponds to this alternative.

2.4 The subject-matter of claim 1 is therefore supported by a combination of claim 1 as filed with the passages on page 6, lines 12-16 and on page 18, lines 5-13 of the description as filed.

3. Auxiliary request 1 - Novelty

The requirements of Article 54 EPC are complied with for the following reasons:

3.1 Document D2, in particular its Example 2, does not disclose the feature "*metallocene-catalysed ethylene-propylene-based*".

3.2 The opponent however argued that the definition in claim 1 of a "*metallocene-catalysed ethylene-propylene-based*" material would be arbitrary und therefore not suitable for establishing novelty.

3.3 For the board, it is not apparent why the alleged arbitrary selection of a feature should lead to this conclusion, because this feature being definitively not disclosed in D2, the subject-matter of claim 1 containing this feature is thus - according to constant jurisprudence of the boards of appeal - to be considered to be not directly and unambiguously derivable from this document, and so novel over this prior art disclosure.

4. Auxiliary request 1 - Inventive step

The requirements of Article 56 EPC are complied with for the following reasons:

4.1 Closest prior art

4.1.1 In its written submissions, the opponent cited documents D1 (EP 1 614 699 A1), D2, D7 (US 5 691 043) and D9 (US 2002/0187326 A1) as possible starting points for the inventive step argumentation.

D1 discloses (abstract) a polyolefin comprising a polypropylene polymer and a propylene-butene copolymer (PBR), wherein the polyolefin has i.a. good low-temperature heat-seal properties. The board notes that there is however no disclosure of an ethylene-propylene-based copolymer and, most importantly, the above polymer mixture is used in a sealant skin layer and not in a core layer (see example 1b and figure 1).

Example 2 of D2 discloses (see above) a core layer comprising polypropylene and 10 wt% of an ethylene plastomer ("EXACT 8203®") having an isothermal crystallisation temperature lower than 60°C.

D7 discloses (column 6, lines 3-11) a core layer comprising polypropylene and 5-20 wt% of a propylene-butylene copolymer.

D9 discloses (par. [0051]) a film with a core layer comprising polypropylene, polybutylene, copolymers and blends thereof.

4.1.2 The board disagrees with the opposition division's conclusion that since D2 did not address the problem of improving the seal strength, it would not represent the closest prior art. D2 undisputedly belongs to the general technical field of the invention (i.e. multilayered polymeric films), and even if it only refers tangentially to the question of sealing, sealability or seal strength, this is a common problem in this field. Consequently, there is no reason to

disregard this document as a possible starting point. Furthermore the opponent agreed during the oral proceedings before the board to discuss inventive step starting from D2.

Example 2 of D2 being moreover structurally closer to the underlying invention than any one of documents D1, D7 or D9, as being the only multilayered polymeric film disclosing a core layer containing a copolymer in an amount of 5-15 wt% and having an isothermal crystallisation temperature of 60°C or less as defined in claim 1, it represents the closest prior art.

4.1.3 The subject-matter of claim 1 differs from example 2 of D2 in that the core layer comprises a metallocene-catalysed ethylene-propylene-based elastomer.

4.2 Problem solved according to the patent

According to the patent in suit (par. [0010]), the problem underlying the invention is that of *"making high seal strength and hermetic sealing oriented polypropylene-based films in a cost-effective manner with good processability and without requiring in-line extrusion coating or 4-layer coextrusion technology or relatively thick intermediate and/or seal layers"*.

4.3 Success of the solution

4.3.1 In view of Example 5 of the patent in suit, which makes use of "Vistamaxx® 3000" as the *"metallocene-catalysed ethylene-propylene-based"* elastomer, it is credible that the solution in claim 1 provides an increased heat seal strength with respect to the comparative examples (see table 1 on page 10).

4.3.2 The opponent argued that there was no direct comparison between example 2 of D2 and example 5 of the patent in suit, so there was no evidence to support that the above technical effect would be obtained. Consequently, the problem solved was simply that of finding an alternative film.

4.3.3 Although the board considers, in the absence of counter-evidence from the opponent, that the claimed solution provides an improvement in the seal strength with respect to example 2 of D2, it will be assumed for the sake of the argument in the opponent's favour that the invention does not provide an improved seal strength with respect to D2. But even under this assumption, it cannot be overseen that example 5 shows that the seal strength of the film according to claim 1 is particularly high.

Thus, contrary to the opponent's conclusion, the invention does not solve the problem of providing an arbitrary alternative film, but that of providing an alternative film having high sealing strength.

4.4 Obviousness

4.4.1 The opponent argued that document D2 explicitly contemplated (par. [0026]) the alternative of metallocene catalysed ethylene-propylene copolymers. Although these copolymers were said to have relatively high melting points (115°C to 150°C according to par. [0030]), it would be obvious in view of table 2 and examples 1-3 of D1 to select copolymers having lower melting and crystallisation temperature, thereby arriving at the scope of claim 1 in an obvious manner.

4.4.2 The board disagrees with this argumentation for the following reasons:

- The alternative "metallocene catalyzed ethylene-propylene copolymers" in document D2 is disclosed for the purpose of controlling the shrinking of the layers (see par. [0026]), so there would be no incentive for the skilled person to consider adding this substance to the core layer of example 2 of D2 to solve the problem of providing an alternative with high sealing strength.

- There would also be no reason in view of examples 1-3 and table 2 of D1 to select copolymers having an isothermal crystallisation temperature falling within the scope of claim 1. First, the teachings of D1 concern propylene-butene and not ethylene-propylene copolymers. Second, there is no suggestion in D1 to modify the isothermal crystallisation temperature to fall within the range defined in claim 1. Third, there would be no reason to selectively pick and combine specific aspects from the disclosures in D1 and D2, let alone to consider this cherry-picked modifications to arrive at a subject-matter having significantly better sealing strength properties than the examples in document D1 (i.e. the fact that the result of the combination is better than those obtained in D1 is an indication that the solution is inventive).

The subject-matter of claim 1 is therefore not obvious in view of example 2 of D2 taken in combination with the teachings of D1.

4.4.3 The board notes that the same conclusions would be reached if D1, D7 or D9 were taken as closest prior art, because there is no indication in this prior art which could (let alone would) lead the skilled person

to replace the copolymers disclosed in these documents with metallocene-catalysed ethylene-propylene based elastomers for the purpose of providing a high sealing strength. In particular, the reference in example 7D of document D10 (US 2008/0064805 A1) to "TAFMER XM 7070" is not relevant because this is a propylene-butene copolymer and not an ethylene-propylene copolymer. Document D10 does also not indicate that the use of such copolymers in polypropylene containing core layers would provide an advantage in terms of heat seal strength. Furthermore, when starting from example 1b in D1 as closest prior art, there is no apparent reason to use the polypropylene-copolymer layer as a core layer rather than as a skin sealable layer.

- 4.5 The board therefore concludes that the subject-matter of claim 1 is inventive in view of the cited prior art and so meets the requirements of Article 56 EPC. The same applies to claims 2 to 11, all depending directly or indirectly on claim 1, and therefore including all its features.
5. Auxiliary request 1 as upheld by the opposition division therefore meets the requirements of the EPC.
6. In consequence none of the appeals succeeds and the decision of the opposition division is confirmed.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:



A. Pinna

J.-M. Schwaller

Decision electronically authenticated