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Datasheet for the decision of 30 June 2015

Case Number: T 1316/12 - 3.3.09

Application Number: 06256528.8

Publication Number: 1941998

IPC: B32B27/32

Language of the proceedings: EN

Title of invention:
Film

Patent Proprietor:
Borealis Technology Oy

Opponent:
THE DOW CHEMICAL COMPANY

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

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European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1316/12 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 30 June 2015

Appellant: (Opponent)	THE DOW CHEMICAL COMPANY 2030 Dow Center Midland, Michigan 48674 (US)
Representative:	Jansen, Cornelis Marinus V.O. Johan de Wittlaan 7 2517 JR Den Haag (NL)
Respondent: (Patent Proprietor)	Borealis Technology Oy P.O. Box 330 06101 Porvoo (FI)
Representative:	Campbell, Neil Boyd Dehns St Bride's House 10 Salisbury Square London EC4Y 8JD (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 30 March 2012 maintaining European patent No. 1941998 in amended form.**

Composition of the Board:

Chairman	W. Sieber
Members:	W. Ehrenreich
	F. Blumer

Summary of Facts and Submissions

I. The appeal of the opponent concerns the interlocutory decision of the opposition division to maintain European patent No. 1 941 998 in amended form on the basis of the claims according to the main request filed during the oral proceedings held on 29 February 2012.

Claim 1 of the main request reads as follows:

"1. A uniaxially oriented multilayer film comprising at least (i) a layer (A) and (ii) a layer (B), wherein

said layer (A) comprises a mixture of a LLDPE produced using a single site catalyst (mLLDPE) and a multimodal LLDPE produced using a Ziegler-Natta catalyst (znLLDPE),
said layer (B) comprises a multimodal LLDPE, and wherein
said multilayer film is in the form of a stretched film which is uniaxially oriented in the machine direction (MD) in a draw ratio of at least 1:3."

II. The opposition was based on the grounds that the invention lacked novelty and inventive step (Article 100(a) EPC) and that the invention was insufficiently disclosed (Article 100(b) EPC). The documents cited during the opposition proceedings included:

D1 Brochure "MDO Film - Orientated PE and PP packaging film" ©2004 Borealis A/S
D2 O.J. Myhre et al. "Oriented PE films" - Expanding Opportunities with Borstar®PE, Maack Specialty Films 2001, pages 1-10
D3 Brochure "Borstar® PE for blown film

applications", © 2007 Boralis AG
D4 Brochure "Borstar® Heavy Duty Shipping Sacks", © 2007 Borealis AG
D5 WO 2006/037603 A1
D6 EP 1 488 924 A1
D9 US 2005/0200046 A1.

III. The reasons given in the decision of the opposition division can be summarised as follows:

Sufficiency of disclosure

There was a conditional objection of insufficiency of disclosure based on D5. As this objection was not further discussed during the oral proceedings, there was no need to go into it further.

Novelty

The claimed film was novel over D1, D2 and D5.

Inventive step

The claimed subject-matter involved an inventive step over D1 representing the closest prior art, either taken alone or in combination with the cited prior art, e.g. D9.

IV. The opponent (hereinafter: the appellant) filed its notice of appeal on 8 June 2012 and paid the prescribed fee on the same day. The statement of grounds of appeal was received on 1 October 2012 and included, *inter alia*,

D12 WO 95/13321 A1.

Although the appellant stated that "Our objections under lack of novelty and inventive step are maintained", it was not clear from the the submission whether attacks on novelty were maintained. Objections as to lack of sufficiency of disclosure were no longer raised.

V. With its letter of response dated 15 February 2013 the proprietor (hereinafter: the respondent) requested that the appeal be dismissed. It also filed auxiliary requests 1 to 6 and an experimental report D13.

VI. The appellant provided further arguments relating to inventive step with its letter dated 7 May 2015.

The respondent replied with its letter dated 28 May 2015.

VII. In a communication issued on 19 May 2015 the board made its preliminary and non-binding observations on essential issues.

Concerning inventive step the board noted that both parties considered D1 to represent the closest prior art. In this context the board *inter alia* raised the following points:

- No mixing ratios are given for mLLDPE and znLLDPE present in layer (A). Thus either mLLDPE or znLLDPE can be present in minute amounts.
- Doubts exist whether the open definition "comprising ... a layer (A) and a layer (B)" unambiguously defines layer (A) as the outer sealing layer. It is thus questionable whether the experimental report D13, which relates to a specific film with a ratio of 80/20 for znLLDPE/

mLLDPE in layer (A) and shows a higher seal strength at lower sealing temperature for this embodiment, can give rise to inventive step.

VIII. In reaction to the board's communication the respondent filed auxiliary request 7.

IX. On 30 June 2015 oral proceedings before the board took place. At the beginning of the hearing the appellant stated that there was no novelty objection against any of the respondent's requests on file.

First, the issue of inventive step of the subject-matter of the main request was discussed on the basis of D1 as closest prior art

(i) starting from the film recipe on page 4, and, alternatively

(ii) starting from the film recipe on page 6.

In this context D6, D12 and D13 were discussed.

After a discussion about the absence from claim 1 of the main request of any quantitative limitation of the individual components in layer (A) and layer (B), the respondent filed a new auxiliary request 1 (claims 1 to 18) in order to address this point. Claim 1 of this request reads as follows:

"1. A uniaxially oriented multilayer film comprising layers in the following order:

(i) layer (A),
(ii) layer (B) and
(iii) layer (C)

wherein

said layer (A) comprises a mixture of 10 to 50 wt% LLDPE produced using a single site catalyst (mLLDPE) and 50 to 90 wt% multimodal LLDPE produced using a Ziegler-Natta catalyst (znLLDPE),
said layer (B) comprises at least 80 wt% of a multimodal LLDPE, and wherein
said multilayer film is in the form of a stretched film which is uniaxially oriented in the machine direction (MD) in a draw ratio of at least 1:3."

The appellant did not object to the admission of the new auxiliary request 1 and had no objections under Article 123(2) EPC.

An adapted description was also filed.

X. Because the respondent withdrew its previous requests (main request, previous auxiliary requests 1 to 7) at the end of the oral proceedings, and the relevant issue for this decision is inventive step, only the arguments of the parties concerning inventive step in relation to the new auxiliary request 1 are summarised in the following.

XI. Arguments of the appellant

First approach starting from the film recipe at page 4 of D1

The film disclosed at page 4 of D1 has the layer sequence A-B-A and is uniaxially oriented in MD at a draw ratio of 1:5. Layer (A) is composed of 85% mLLDPE and 15% LDPE, and layer (B) is composed of 80% bimodal znLLDPE and 20% (unimodal) mLLDPE. The right column at page 4 points to good physical properties of this three-layer film.

The film in claim 1 differs therefrom essentially in that layer (A) comprises a multimodal znLLDPE. It is not apparent from the data presented in Table 4 of the patent specification which physical properties of the claimed film are improved over those of the film according to page 4 of D1. Thus, the objective problem to be solved by the claimed invention has to be seen only in the provision of an alternative film with good physical properties.

D6 discloses a multilayer polyolefin film for food packaging, which gives rise to a flexible sealed pack (paragraphs [0011 and [0024]). Preferred polymer components for the sealing layer, which is the outer layer of a multilayer film, are disclosed in paragraph [0031]. It is pointed out that a particularly preferred sealing layer is a mixture of an mLLDPE and a multimodal znLLDPE (e.g. Borstar FB2230). Thus, a skilled person intending to provide an alternative film with good sealing properties was incited to modify layer A of the film according to page 4 of D1 by adding a multimodal znLLDPE. The film according to claim 1 is therefore obvious from a combination of the disclosures at page 4 of D1 and D6.

D12 concerns films with excellent heat sealing and points on the last paragraph of page 1 to the additional need to provide good physical and mechanical properties. According to page 11, lines 2 to 4 the films may be multilayer films and uniaxially oriented. The (outer) sealing layer is a blend of a first polymer component A having a narrow molecular weight and composition distribution, i.e. a polymer prepared by a metallocene catalyst, e.g. an mLLDPE, and a second polymer component B produced by a Ziegler-Natta

catalyst, e.g. a multimodal znLLDPE (page 3, last paragraph and Sample U7 prepared in Example III). The preferred ratio A/B is 40-99/1-60 (paragraph bridging pages 12/13). The skilled person who intends to improve the sealability of the film according to page 4 of D1, while maintaining its good physical and mechanical properties, is therefore incited to provide a mixture of mLLDPE and znLLPE in layer A of this film.

Thus, a combination of the disclosures at page 4 of D1 and D12 also leads to the film of claim 1.

Second approach starting from the film recipe at page 6 of D1

The film recipe at page 6 of D1 concerns compression packaging films with the layer sequence A-B-B which are uniaxially oriented in MD at a draw ratio of 1:5.5. Benefits of the film are good mechanical properties and appropriate sealing within a normal temperature range for oriented polyethylene (OPE) films. Layers A and B are both composed of 100% multimodal znLLDPE and correspond to the layers of the reference film according to the experimental report D13.

The claimed film differs therefrom only in that layer A comprises mLLDPE in addition to znLLDPE. However, for the same reasons as mentioned above the skilled person is prompted by the disclosure in D6 or D12 to provide a mixture of mLLDPE and multimodal znLLDPE for layer A of the film according to page 6 of D1 in order to improve its sealing properties.

XII. Arguments of the respondent

First approach of the appellant based on the film recipe at page 4 of D1

The film disclosed at page 4 is a display packaging film which should provide good visibility of the content (left column at page 4). The benefits of the film are inter alia excellent optics (right column). This film differs from the claimed film in that layer A does not contain znLLDPE as required by claim 1.

A skilled person intending to maintain the excellent optical properties of the film according to page 4 of D1 has no motivation to take any measures which would possibly destroy its excellent optics, i.e. the most important property of this film. Because neither D6 nor D12 pertains to the improvement of the optical properties of multilayer films, the skilled person would not turn to these documents in order to change the composition of the layers of the film according to page 4 of D1.

As regards the arguments of the appellant based on a combination of D1 with either D6 or D12 relating to an improvement of the sealing properties, it should be noted that sealing is not an important aspect for the claimed invention. Rather, the patent in suit relates to films which can be formed into bags and sacks suitable for heavy packaging and not to sealable films for food packaging as disclosed in D6. Moreover, D12 mainly relates to monolayer films, as can be seen from the examples.

Thus a combination of the disclosures at page 4 of D1 and D6 or D12 would not lead to the claimed invention.

Second approach of the appellant based on the film recipe at page 6 of D1

The film at page 6 of D1 is designed for compression packaging purposes in order to pack voluminous products so as to save space and transportation costs, and therefore serves from a different purpose as films of the invention which are designed for heavy packaging. Moreover, the experimental report D13 shows an improvement in tear strength and dart drop impact properties of the film according to claim 1 with a composition of 80%/20% multimodal znLLDPE/mLLDPE over a film with a composition of 100% znLLDPE in layers A and B, which corresponds to the film according to page 6 of D1.

The skilled person intending to improve tear strength and dart drop impact strength of the film according to page 6 of D1 would therefore not turn to D6 or D12 which relate to the improvement of sealability.

XIII. Final requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

The respondent requested that the decision under appeal be set aside and that the patent be maintained on the basis of its sole request, namely auxiliary request 1 (claims 1 to 18 and amended description pages 2 to 15) as filed during oral proceedings before the board.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of auxiliary request 1 submitted during the oral proceedings

Claim 1 of auxiliary request 1 now relates to a film comprising three layers in the order (A), (B) and (C), and contains a limitation in respect of the amount of the components in layers (A) and (B), namely a mixture of 10 to 50 wt% mLLDPE and 50 to 90 wt% multimodal znLLDPE in layer (A), and at least 80 wt% of a multimodal LLDPE in layer (B). These elements were already present in previous auxiliary requests 2, 4 and 7.

Thus the newly filed auxiliary request 1 did not introduce new matter which would have been surprising for the appellant or the board. Moreover, the appellant did not object to the admission of the request. The board therefore decided to admit auxiliary request 1 into the proceedings.

3. Amendments

The appellant did not raise objections under Articles 84 and 123(2) EPC against claims 1 to 18 of auxiliary request 1. The board is satisfied that the requirements of these articles are met.

As regards the amendments in claim 1, the amounts of mLLDPE (10 to 50 wt%) and multimodal znLLDPE (50 to 90 wt%) for layer (A) are based on page 5, lines 11 to 18, and the amount of at least 80 wt% multimodal LLDPE for layer (B) is based on page 7, lines 1 to 5 of the description as filed. The layer sequence in the order (A)-(B)-(C) has its basis in claim 7 as filed and page 3, lines 9 to 15 of the description as filed.

Claim 11, which relates to a process for preparing a multilayer film as claimed in any one of claims 1 to 10, contains the further limitation that composition (c) for making layer (C) comprises an LLDPE, which is supported by claim 6 as filed.

The amendments also do not give rise to an objection under Article 84 EPC.

4. Novelty

In the oral proceedings the appellant confirmed that it had no novelty objections. The board saw no reason to raise any such objection of its own.

5. Inventive step

5.1 The invention relates to a film with is uniaxially oriented in machine direction and has good mechanical properties, such as puncture and tear resistance, and can thus be formed into bags or sacks for packaging, especially heavy duty shipping bags. The film comprises a certain combination of linear low density polyethylene polymers (LLDPE) (patent specification, paragraphs [0001] and [0004]).

5.2 As agreed by both parties, D1 represents the closest prior art. D1 is a manufacturer brochure on Mono Directional Orientation (MDO) of blown PE and PP films, and discloses various film compositions ("recipes") in the context of specific applications. A key polymer material in described films is LLDPE (page 3). At pages 4 and 6 the following two types of films are described:

Film at page 4

Display packaging films with high gloss and transparency in order to achieve a good appearance, one typical example being wrapping films for magazines and mailers. Good visibility of the content is desired and the film must at the same time have the strength to carry the contents through distribution without breakage. The following film recipe is given:

- ABA co-extruded film
- Composition of A layer: 85% mLLDPE + 15% LDPE
- Composition of B layer: 80% bimodal znLLDPE + 20% mLLDPE
- Draw ratio = 1:5
- Film thickness = 20 µm.

The benefits of the film include excellent optics, convenient sealing and high tear resistance.

Film at page 6

Compression packaging film for packing voluminous products such as insulation materials and mattresses which are normally packed in a compressed form. The film is characterised as follows:

- ABB co-extruded film
- Composition of A layer: multimodal znLLDPE
- Composition of B layer: a different multimodal znLLDPE
- Draw ratio = 1:5.5
- Film thickness = 45 µm.

The benefits of the film are high impact strength, very good creep resistance, appropriate sealing, and good tear resistance.

5.3 According to claim 1 of auxiliary request 1, a film comprising three layers in the order A-B-C is proposed, wherein layer A differs from layer A of the film recipes according to pages 4 and 6 of D1 in that it comprises a mixture of 10 to 50 wt% mLLDPE and 50 to 90 wt% multimodal znLLDPE.

In considering inventive step it has to be assessed whether or not the claimed film is obvious for a skilled person starting from the individual film recipes disclosed at page 4 and page 6 of D1.

5.4 Obviousness in the light of the film recipe at page 4 of D1

5.4.1 The respondent accepted that the problem to be solved by the claimed film in the light of the film disclosed at page 4 of D1 was the provision of an alternative film.

5.4.2 The skilled person starting from the film recipe according to page 4 of D1 learns that the film is specifically designed for display packaging and must therefore possess excellent optical properties, such as high transparency, in order to guarantee good visibility of the goods wrapped by this film. For this reason, the layer (A) in this film comprises LDPE, a polymer well known to give low haze. The skilled person aiming to maintain the good optical properties is therefore not incited to take measures which possibly would affect these optical properties. The skilled

person would therefore not move away from LDPE, which is good for transparency, to a multimodal znLLDPE.

5.4.3 The appellant's combination with D6 or D12 appears to be based on hindsight. D6 is about a film with polypropylene and polyethylene components used in food packaging. D6 is not about MDO films at all. There is simply no incentive for the skilled person starting from a brochure on MDO polyethylene films, specifically films for display packaging for magazines, to target D6, especially given that the appellant has focused on passages which describe components of the sealing layer. As pointed out by the respondent, the film on page 4 of D1 is a film for wrapping magazines where transparency is the most important feature. Good sealing might be useful, but the sealed products of D1 are not problematic if leakage occurs. D12 is directed to heat-sealable films and articles made therefrom. D12 does not exemplify uniaxially oriented films and does not exemplify multilayer films. It is not clear how, starting from the film on page 4 of D1, the skilled person would find D12 and use elements of this document to modify layer A of the film of D1. In fact, the skilled person would not go in this direction because it would be expected to damage the optical properties of the film at page 4 of D1. Therefore the film according to claim 1 is a non-obvious alternative to the film according to page 4 of D1.

5.5 Obviousness in view of the film recipe at page 6 of D1

5.5.1 As set out in paragraphs [0011] and [0012] of the patent, the claimed films provide a desirable balance of mechanical properties, such as impact and tear resistance, at film thicknesses considerably lower than those used in the prior art for such applications.

The respondent's experimental report D13 confirms an improvement in mechanical properties due to the use of a polymer blend according to claim 1 in layer A, namely a mixture of 20% mLLDPE and 80% multimodal znLLDPE. In an ABA structure of 25 µm this blend is compared to one where the A layer contains multimodal znLLDPE only (as in the film at page 6 of D1). Table 2 of D13 shows improved tear properties in MD and TD and improved dart drop impact properties for the film according to claim 1.

In this context the board does not share the appellant's argument at the oral proceedings that the effect was not credible over the whole scope of claim 1 because it was shown only for a single specific film composition. The appellant has failed to provide any evidence for this contention. It is thus not apparent why the effect demonstrated in D13 is strictly limited to this specific embodiment of the invention and cannot be reliably achieved over a broader range relating to the mixing ratio of mLLDPE and znLLDPE in layer A of the claimed film.

5.5.2 Thus, with regard to the film recipe at page 6 of D1 a more ambitious problem can be formulated, i.e. the provision of a film suitable for heavy packaging and having improved mechanical properties. As apparent from the discussion of D13 above, this problem is plausibly solved.

5.5.3 There is nothing in D1 itself which would suggest adding mLLDPE to the film on page 6 in order to solve the posed problem. Nor can D6 or D12 provide such an incentive. As set out above, the teachings of these documents focus on improving the sealing properties,

not the mechanical ones. Thus, any combination of D1 with D6 or D12 is based on hindsight.

5.5.4 But even if one were not to accept that the objective technical problem has to be seen in the provision of films with improved mechanical properties but merely in the provision of alternative films, the claimed subject-matter would still involve an inventive step.

Starting from the film on page 6 of D1, the skilled person needs to add mLLDPE in a certain amount. For reasons similar to those already given in relation to the alternative disclosed on page 4 of D1, the skilled person had no incentive to use elements from D6 or D12 in order to modify a film in a completely different field, namely the film disclosed on page 6 of D1 used as a compression packaging film for packing voluminous products.

The claimed film is thus also an alternative which is not obvious when starting from the film at page 6 of D1 and considering it in context with the disclosure in D6 or D12.

5.6 In summary, the film according to claim 1 of auxiliary request 1 involves an inventive step. For the same reasons, the process according to claim 11 for the preparation of the film of claim 1 (including the further limitation that the layer C comprises LLDPE), the film obtainable by the process of claim 1 according to claim 15, the use of this film and the article comprising this film, as claimed in claims 16 to 18, also involve an inventive step.

6. For the above-mentioned reasons the claims of auxiliary request 1 filed during the oral proceedings before the board are therefore allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the following documents:

   - claims 1 to 18, filed as auxiliary request 1 during oral proceedings before the board
   - description pages 2 to 15 as filed during the oral proceedings before the board.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated