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Datasheet for the decision of 5 April 2011

Case Number: T 0518/09 - 3.3.09

Application Number: 00912963.6

Publication Number: 1172202

IPC: B32B 27/34

Language of the proceedings: EN

Title of invention:
Multilayered casing film

Patentee:
Kureha Corporation

Opponent:
Kalle GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0518/09 **-** 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 5 April 2011

Appellant: (Opponent)
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Representative:
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 11 December 2008 rejecting the opposition filed against European patent No. 1172202 pursuant to Article 101(2) EPC.

Composition of the Board:

Chairman: W. Sieber
Members: N. Perakis
K. Garnett

Summary of Facts and Submissions

I. Mention of the grant of European patent No 1 172 202 in respect of European patent application No 00912963.6 in the name of KUREHA KAGAKU KOGYO KABUSHIKI KAISHA, which had been filed as international application No. PCT/JP2000/002009 on 30 March 2000, was published on 17 November 2004 (Bulletin 2004/47). The patent was granted with three claims, independent Claim 1 reading as follows:

"1. A shirrable multilayer casing film comprising five laminated layers of a polyamide homopolymer, an adhesive polyolefin, a polyolefin, an adhesive polyolefin and a polyamide copolymer which have been laminated in this order and co-stretched; wherein the polyamide homopolymer layer has a higher melting point and a smaller thickness than the polyamide copolymer layer, and the adhesive polyolefin layer comprises an acid-modified α-olefin resin."

II. A notice of opposition was filed by Kalle GmbH on 8 August 2005 requesting revocation of the patent in its entirety on the grounds that the claimed subject-matter was neither novel nor inventive (Article 100(a) EPC).

The following documents were filed among others during the proceedings before the opposition division:

D1: EP 467 039 A2;
D3: DE 43 39 337 A1; and
D4: Affidavit of Mr. Uehara dated 7 March 2006 (filed by the patent proprietor).

III. By a decision announced orally on 6 November 2008 and issued in writing on 11 December 2008 the opposition division rejected the opposition. The opposition division considered that the subject-matter of the granted claims was novel over D1 and D3 and involved an inventive step in view of these documents.

IV. On 20 February 2009 the opponent (appellant) lodged an appeal against the decision of the opposition division requesting revocation of the patent in its entirety. The appeal fee was paid on the same day. The statement setting out the grounds of appeal was filed on 20 April 2009. The appellant contested the decision of the opposition division and argued that the claimed subject-matter lacked an inventive step.

V. With a letter dated 21 August 2009 the respondent patentee filed observations defending the decision of the opposition division. It also filed auxiliary requests 1-3, which, by letter dated 31 March 2011, were replaced by auxiliary requests 1-8.

VI. In a letter dated 8 February 2011, the appellant contested for the first time in the appeal proceedings novelty of the claimed subject-matter. It also filed additional arguments regarding the issue of inventive step and submitted the following new document:

D5: Declaration of Mr. Stenger dated 7 February 2011.

VII. The board issued a communication dated 21 February 2011 expressing its preliminary opinion according to which

the claimed subject-matter was not obvious having regard to the cited state of the art.

VIII. Oral proceedings were held before the board on 5 April 2011. During the oral proceedings the appellant pursued the late-filed novelty objection under the heading of inventive step. Eventually the respondent withdrew its auxiliary requests.

IX. The arguments put forward by the appellant in its written submissions and at the oral proceedings can be summarised as follows:

- In order to assess the patentability of the claimed subject-matter the terms used in Claim 1 needed interpretation.

- Thus the "polyamide homopolymer" and the "polyamide copolymer" layers did not exclusively consist of the respective polymers but allowed the presence of other constituents in amounts which were not specified in the claim. The interpretation of the opposition division, that these layers could contain at least 50 wt.% of the respective polyamide, was wrong since the contested patent did not provide support for such an interpretation. Nor was an upper limit of 30 wt.% of additional constituents correct, as such a value was disclosed in the patent specification merely as an exemplary value. On a correct interpretation, the respective polyamide polymer content of these layers could be any value, i.e., even lower than 50 wt.%.

– Furthermore the non-specific expressions "higher melting point" and "smaller thickness" were not clear. The patent specification on the one hand provided specific values for the melting point and the thickness of the polyamide layers and on the other hand disclosed how much higher the melting point and how much smaller the thickness of the polyamide homopolymer layer should be so that the film shows the desired properties.

– For the issue of inventive step each of D1 and D3 could be considered to represent the closest state of the art. Both documents disclosed tubular multilayer films, in particular co-extruded and co-stretched five-layer films, with a polyamide inner and outer layer - the outer layer being thicker than the inner layer. The technical difference between the claimed film and that disclosed in D1 or D3 was that the thicker layer was a polyamide copolymer layer with a smaller melting point and the thinner layer was a polyamide homopolymer layer with a higher melting point.

– Concerning the technical problem to be solved, D1 (page 6, lines 1-7) discloses that the film arrangement solves the problem of high-temperature creep resistance as set out in the patent in suit. D1 discloses that no formation of long tags or of pear-shaped deformations or bag-in-bag formation is observed during the subsequent heating of the sausages to core temperatures of about 80°C. This corresponded to the definition of creep resistance in the contested patent (page 1, paragraphs [0004] and [0010]; page 9, paragraph [0057]), i.e., the

prevention of change in shape, noticeably from a cylindrical shape due to expansion of the content material after the filling with the content material. Therefore the only problem the claimed subject-matter solved over D1 was the improvement of the stretchability of the multilayer film.

– The solution based on the selection of specific polyamide polymers for the respective thicker and thinner layer, i.e., a thinner polyamide homopolymer with a higher melting point for the inner layer and a thicker polyamide copolymer with a lower melting point for the outer layer, would be obvious to the skilled person. This selection had nothing that could be considered as surprising. It was known in the art that the stretchability depends on the melting point and crystallisation speed of the polyamide polymer, which requires that orientation takes place on the extruded amorphous polymer, before it crystallises. The polyamide polymers used were known and thus their properties belonged to the state of the art. Thus the skilled person would have been aware that polyamide homopolymers, such as Ny6, crystallise faster than polyamide copolymers, such as Ny6-66, and have a higher yield stress (see D4: Figures 1 and 2). On this basis he would conclude that polyamide homopolymers could not be stretched unless under a specific pre-stretching heating, namely using rapid heating by applying IR radiation for a very short time (D1: page 6, lines 45-46; D3: page 6, lines 41-42). The skilled person also knew that the polyamide copolymer was easily biaxially stretchable (D1: page 5, lines 20-25). Consequently he would have found it obvious to

replace the rapidly crystallising polyamide homopolymer in the outer layer of the tubular multilayer film of D1 by a slower crystallising polyamide copolymer.

X. The arguments put forward by the respondent in its written submissions and at the oral proceedings can be summarised as follows:

- The claimed subject-matter was clearly and unambiguously defined. The wording of Claim 1 allowed the inclusion of small amounts of other compounds in the polyamide layers as long as this fell under the claimed scope. Thus the polyamide homo- or co-polymer layers could comprise up to 30 wt.% of other compounds, a specific limit disclosed in the patent specification (paragraphs [0019] and [0023]), which, in fact, did not disclose any value beyond that limit. Contrary to the allegation of the appellant, the value of 30 wt.% was not a simple example but constituted a strong limitation. Thus, also the interpretation given in the decision of the opposition division, namely that the respective layer comprised a majority of polyamide homo- or copolymer, i.e., at least 50 wt.%, was wrong.

- Regarding the expressions "higher melting point" and "smaller thickness", they were unjustifiably objected as lacking precision. In fact, the skilled person would find the necessary information in the patent specification, which would guide him in understanding the meaning of these expressions.

- With regard to the issue of inventive step, whichever of D1 or D3 was considered to represent the closest state of the art, the claimed invention was not obvious except with the use of hindsight. The technical problem solved over D1 and D3 was not that alleged by the appellant but the provision of a tubular multilayer film with "balanced properties" of high-temperature creep resistance and film stretchability. The experimental evidence of the contested patent (Examples 1-4 and 6 and Comparative Example 2) showed that the technical problem was solved over D1 and D3.

- The use of a different polyamide polymer in each of the polyamide layers of the multilayer tubular film according to the claimed invention could not be derived in an obvious manner from D1 or from D3. These documents did not deal with the said balance of properties. Furthermore neither of them would motivate the skilled person in the direction of replacing the polymer of the outer thicker layer, a polyamide homopolymer, by a polyamide copolymer with a lower melting point than that of the polymer of the inner layer, while using a polyamide homopolymer for the inner thinner layer the latter having a higher melting point than that of the outer layer.

- The declarations of Mr Uehara (D4) and Mr Stenger (D5) provided plausible, but *ex-post facto*, scientific explanations of the effects obtained by the claimed invention, which effects were not known on the priority day of the patent in suit.

XI. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. Interpretation of Claim 1

The subject-matter of Claim 1 relates to a multilayer film comprising five layers, laminated in the following order:

(i) a layer of a polyamide homopolymer (PA HP),
(ii) a layer of an adhesive polyolefin (PO AD),
(iii) a layer of polyolefin (PO),
(iv) a layer of an adhesive polyolefin (PO AD), and
(v) a layer of a polyamide copolymer (PA CP).

Layer (i) is thinner than layer (v).
Layer (i) has a higher melting point than layer (v).
Layers (ii) and (iv) comprise an acid-modified α-olefin resin.

The multilayer film has been manufactured by laminating the layers and co-stretching. The film is shirrable and can be used for casing.

2.1 The appellant noted that Claim 1 refers to a "polyamide homopolymer" layer (i) and a "polyamide copolymer" layer (v) without further definition, whereas the patent specification (paragraphs [0019] and [0023]) makes it clear that a polyamide co-/homopolymer or other thermoplastic resin may be blended in these layers. Thus, the content of polyamide homopolymer in layer (i) and the content of polyamide copolymer in layer (v) was said to be undefined.

However the board considers that the claim in the light of the description unambiguously concerns polyamide layers which can contain only a certain amount of other specific constituents, namely up to 30 %wt. Thus, with regard to layer (i), paragraph [0019] states:

"Within an extent of maintaining such a melting point …, it is possible to blend a polyamide copolymer as described hereinafter or another thermoplastic resin in a proportion of, e.g., up to 30 wt.%."

With regard to layer (v), paragraph [0023] states:

"As far as this is satisfied, it is possible to blend the above-mentioned polyamide homopolymer or another thermoplastic resin in a proportion of up to , e.g., 30 wt.%".

These disclosures define the chemical nature of the layers and their content as regards the further constituent(s). Thus, in the case of the polyamide copolymer layer the further constituent can be either a polyamide homopolymer or another thermoplastic resin, whereas in the case of the polyamide homopolymer layer

this can be either a polyamide copolymer or another thermoplastic resin. These disclosures define also the upper limit for further constituent(s), which is set at 30 wt.%. A value exceeding this upper limit is not disclosed anywhere in the patent specification. The board therefore can accept the respondent's argument that, when considering the patent in suit as a whole, the polyamide layers (i) and (v) referred to in Claim 1 can contain up to 30 wt.% of further constituent(s).

In this context it is worth mentioning that the opposition division's interpretation that layers (i) and (v) contain "a majority (i.e. more than 50 wt.%)" of polyamide homopolymer and polyamide copolymer, respectively, appears unjustifiably broad.

2.2 Finally the board considers that the features relating to the thickness of the polyamide layers and to their melting point neither create ambiguity nor prevent the skilled person from understanding the claimed subject-matter. Basically, the appellant's objection in this context - in fact, it objected to the absence of essential features in Claim 1 - amounts to a clarity objection, which is not a ground for opposition under Article 100 EPC. Apart from that, the board accepts that the patent specification provides the skilled person with sufficient guidance for the preparation and characterisation of a multilayer film with a thinner polyamide homopolymer layer having a higher melting point and a thicker polyamide copolymer having a lower melting point.

3. Inventive step

3.1 During the oral proceedings before the board the appellant pursued the late-filed novelty objection in view of D1 under the heading of inventive step. Apart from that, the board acknowledges that none of the cited documents discloses the combination of features constituting the subject-matter of Claim 1.

Thus the only issue to be further discussed is inventive step.

3.2 The appellant contested inventive step, arguing that either D1 or D3 could represent the closest state of the art. Both documents have very similar contents and solve similar technical problems. The board, however, considers that D1, although it is the older document and is cited in D3 (page 3, line 47 to page 4, line 2), represents the state of the art which is closest to the claimed invention. D1 is more flexible regarding the nature of the polyamide to be used in the polyamide layers and makes explicit reference to the problem of high-temperature creep resistance, which is one of the properties to be balanced in the claimed multilayer film.

3.2.1 D1 discloses in Claim 1 a multilayered, tubular packaging casing for pasty materials having:

- an outer layer based on an aliphatic polyamide, an aliphatic copolyamide or a polymer blend containing at least one of these polymers,
- an intermediate layer comprising a polyolefin and an adhesion-promoting agent, and

– an inner layer based on aliphatic and/or partially aromatic polyamides and/or an aliphatic and/or partially aromatic copolyamides.

In the case where the intermediate layer comprises a polyolefin core layer that is provided on both of its surfaces with a coating layer comprising a polyolefin/adhesion-promoting agent mixture or an adhesion-promoting agent alone, the tubular multilayer film comprises five layers (page 3, line 57 to page 4, line 3). The outer layer is generally thicker than the inner layer (page 2, line 52). The adhesion-promoting agent may be an acid-modified α-olefin resin (page 4, lines 22-30). The multilayer film is manufactured by coextrusion (page 5, lines 46-48) and co-stretching (page 5, lines 48-50).

As regards the chemical nature of the outer and the inner polyamide layers, although D1 rather generally refers to an aliphatic polyamide, an aliphatic copolyamide or a polymer blend containing at least one of these compounds, the board notes that the polyamide layers (inner and outer) in the exemplified films of D1, which represent the most preferred embodiments of D1, are polyamide homopolymer layers, based essentially on the aliphatic homopolymer PA6.

3.2.2 The multilayer films of Claim 1 of the patent in suit differ from those disclosed by D1 in that the outer layer is a polyamide copolymer while the inner layer is a polyamide homopolymer, the copolymer having a lower melting point than the homopolymer.

3.3 The contested patent (paragraphs [0010] and [0012]) discloses that a principle object of the claimed invention is to provide a polyamide-polyolefin-based multilayer casing film having improved high-temperature creep resistance (a problem of conventional multilayer casing films) and excellent thermal stabilities during forming and processing, while maintaining characteristics such as heat-resistance, meat-adhesion characteristics, stretchability, heat-shrinkability and shirring processability. Paragraphs [0020] and [0024] make particular reference to the "balance" between the high-temperature creep resistance and the shirring processability and stretchability required of the product multilayer casing film.

3.3.1 On the basis of these passages the board, in agreement with the respondent, accepts that the above mentioned balance of properties constitutes the technical problem to be solved by the claimed invention.

3.3.2 A comparison of the films according to Claim 1 (Examples 1-4 and 6 of the patent in suit) with a film according to D1 - admittedly represented by Comparative Example 2 - shows that the sought-after balance of properties is in fact achieved. In view of these data and in the absence of any proof to the contrary, the board is satisfied that the set technical problem is solved.

3.4 The question which remains to be answered is whether the skilled person starting from the disclosure of D1 and aiming at providing a multilayer film with balanced properties ***inter alia*** of high-temperature creep

resistance and stretchability would find it obvious to modify the film of D1 so that:

- the thicker outer layer comprises a polyamide copolymer,
- the thinner inner layer comprises a polyamide homopolymer, and
- the selection of these polymers is such that the polyamide copolymer has a lower melting point than the polyamide homopolymer.

3.4.1 The board notes that neither D1 nor any other cited document provides the skilled person with a hint towards the claimed solution. Although D1 embraces the possibility of different polyamide resins in the inner and outer layers, D1 does not disclose the specific claimed combination of a thicker copolymer layer with a thinner homopolymer layer. On the contrary, the examples, which concern preferred embodiments of that disclosure, concern polyamide homopolymers in both layers and thus lead the skilled person away from the claimed invention.

3.4.2 The appellant contested inventive step of the claimed subject-matter and argued that the films of D1 did not face any problem regarding high-temperature creep resistance. In this context reference was made to page 6, lines 2-6 of D1. Thus, the problem to be solved over D1 had to be seen in the provision of a multilayer film with improved stretchability only. In order to solve this problem the replacement of the polyamide homopolymer in the outer thicker layer of the film of D1 by a polyamide copolymer would be obvious to the skilled person in the art. Since stretchability depended on the crystallisation rate of the amorphous

polymer to be stretched, and because the skilled person would know that a polyamide homopolymer such as Ny6 (cited as PA6 in D1) would crystallise faster than a polyamide copolymer such as Ny6-66 (cited as PA6/66 in D1) (Figure 1 in D4; D5), he would find it obvious to replace the rapidly crystallising Ny6 (PA6) by the slower crystallising Ny6-66 (Pa6/66).

3.4.3 However, the board cannot accept the appellant's argument for the following reasons:

It is evident from the examples in the patent in suit that the films according to Claim 1 indeed have improved stretchability. For example, when films according to the invention are stretched under conditions as set out in paragraph [0049] of the patent specification, namely by passing the extruded film layers through a warm water bath at 75°C and subsequently heating them by warm air at 80-100°C, the films show good stretch properties (stretch evaluation A or B, Table 1 of the patent). On the other hand, a film according to D1 having two polyamide homopolymer layers has inferior stretch properties (Comparative Example 2, stretch evaluation C, Table 1 of the patent). This result is not invalidated by the fact that a film according to D1 can be satisfactorily stretched under different conditions, namely heating the co-extruded multilayer film before biaxial orientation by means of IR radiation at 80°C for two seconds. The experiments in the patent in suit clearly demonstrate that films according to Claim 1 provide at least more flexibility with regard to the stretching operations.

3.4.4 Assuming, in favour of the appellant, that the objective technical problem indeed has to be seen in the improvement of the stretchability of the films of D1 only, the solution proposed by the patent in suit, namely the use of a polyamide copolymer layer as set out in Claim 1, is still not obvious from the prior art. If the replacement of a polyamide homopolymer by a polyamide copolymer was obvious, as alleged by the appellant, a person skilled in the art would have certainly replaced both polyamide homopolymer layers of D1 and not only one. There is not the slightest hint in D1 itself or any other cited document to replace only the outer thicker polyamide layer of the films of D1 and to retain the inner polyamide homopolymer layer, i.e., a layer which would still be more difficult to stretch than a polyamide copolymer layer. It appears that the appellant's argument is based on an ***ex post facto analysis*** utilising the scientific explanations provided in D4 and/or D5. As pointed out by the respondent, there is no evidence on file that the effects explained in D4, in particular in the context of the extrusion of multilayer polyamide films, were known before the priority date of the patent in suit.

3.5 In view of the above considerations, the subject-matter of Claim 1 involves an inventive step. The subject-matter of dependent Claims 2 and 3 is considered ***mutatis mutandis*** to involve an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Röhn W. Sieber