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D E C I S I O N
of 6 August 1996

Case Number: T 0104/92 - 3.3.4

Application Number: 86304875.7

Publication Number: 0207719

IPC: B32B 27/32

Language of the proceedings: EN

Title of invention:
Oxygen barrier oriented film

Applicant:
W. R. Grace & Co.-Conn.

Opponent:
-

Headword:
Oriented film/Grace

Relevant legal provisions:
EPC Art. 54 & 56

Keyword:
"Novelty - (yes)"
"Inventive step - (no) conventional trial and error experimentation without employing skills beyond common general knowledge"

Decisions cited:
T 0068/85, T 0060/89

Catchword:
-

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Case Number: T 0104/92 - 3.3.4

D E C I S I O N
of the Technical Board of Appeal 3.3.4
of 6 August 1996

Appellant: W. R. Grace & Co.-Conn.
Grace Plaza
1114 Avenue of the Americas
New York
New York 10036 (US)

Representative: Bentham, Stephen
J. A. KEMP & CO
14 South Square
Gray's Inn
London WC1R 5LX (GB)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 10 September 1991 refusing European patent application No. 86 304 875.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: U. M. Kinkeldey
Members: D. D. Harkness
W. Moser

Summary of Facts and Submissions

I. European patent application No. 86 304 875.7 published as EP-A-0 207 719 and relating to an oxygen barrier oriented film was refused by a decision of the Examining Division dated 10 September 1991.

The decision was taken on the basis of claims filed at oral proceedings comprising as main request amended claims 1 to 10 and as auxiliary request a main claim being further amended with claims 2 to 10 being the same as in the main request.

Claim 1 of the main request read as follows:

"1. A five layer coextruded thermoplastic multi-layer oriented packaging shrink film consisting of:

(a) a core layer comprising ethylene vinyl alcohol copolymer;

(b) two identical intermediate layers, on opposite surfaces of the core layer, comprising an adhesive;

(c) two identical outer layers disposed on respective surfaces of the intermediate layers, opposite the core layer, and comprising a blend of ethylene propylene copolymer and polypropylene wherein the total film thickness ranges from 0,5 to 4 mils (0,0125 to 0,1 mm)."

Claims 2 to 6 were appendant to claim 1, the remaining claims 7 to 10 were directed to methods of production of the films. Claim 1 of the auxiliary request read as claim 1 of the main request with the added feature that the two identical outer layers of paragraph (c) were "heat-sealable".

II. The reasons given for refusal were that the subject matter of claims 1, 2 and 4 to 10 of both the main and auxiliary requests lacked novelty having regard to document

(1) EP-A-0 118 060.

Claims 1, 2, 4 and 5 with passages from pages 9, 11, 13 and 14 of the description of document (1) were novelty destroying for the said claims.

Claim 3 (of both requests) was considered not to relate to inventive subject matter because the person skilled in the art would obviously seek for the best blending ratio of the components in the outer layers to obtain optimum toughness and sealability and would eventually arrive at the blend specified in both claims 3.

III. An appeal was filed and the fee paid at the same time. The statement setting out the grounds of appeal was filed.

The Appellant filed further submissions.

In a communication annexed to the summons to attend oral proceedings the Board indicated the matters to be discussed. It was stated that document (1) was regarded by the Board as the nearest prior art for novelty purposes.

IV. At oral proceedings which were held on 6 August 1996, the Appellant relied upon a main request being the claims 1 to 9 filed on 16 July 1996, and 3 auxiliary requests filed during the oral proceeding which have the following main claims:

"1. A five layer coextruded thermoplastic multi-layer oriented packaging shrink film consisting of:

(a) a core layer comprising ethylene vinyl alcohol copolymer;

(b) two identical intermediate layers, on opposite surfaces of the core layer, comprising an adhesive;

(c) two identical outer layers disposed on respective surfaces of the intermediate layers, opposite the core layer, and comprising a blend of ethylene proplylene copolymer and polypropylene wherein the total film thickness ranges from 0.5 to 4 mils (0.0125 to 0.1 mm)."

First auxiliary request:

"1. A five layer coextruded thermoplastic multi-layer oriented packaging film wherein the total film thickness ranges from 0.5 to 4 mils (0.0125 to 0.1 mm) consisting of:

(a) a core layer comprising ethylene vinyl alcohol copolymer;

(b) two identical intermediate layers, on opposite surfaces of the core layer, comprising an adhesive;

(c) two identical outer layers disposed on respective surfaces of the intermediate layers, opposite the core layer, and comprising a blend of ethylene proplylene copolymer and polypropylene

characterised in that the weight percentages of ethylene propylene copolymer and polypropylene in the outer layers are selected to provide a shrink film having longitudinal and transverse free shrink of at least 17% at 93°C (200°F)."

Second auxiliary request:

"1. A five layer coextruded thermoplastic multi-layer oriented packaging shrink film having longitudinal and transverse free shrink of at leat 17% at 93°C (200°F) consisting of:

(a) a core layer comprising ethylene vinyl alcohol copolymer;

(b) two identical intermediate layers, on opposite surfaces of the core layer, comprising an adhesive;

(c) two identical heat sealable outer layers disposed on respective surfaces of the intermediate layers, opposite the core layer, and comprising a blend of ethylene propylene copolymer and polypropylene wherein the total film thickness ranges from 0.5 to 4 mils (0.0125 to 0.1 mm)."

Third auxiliary request:

"1. A five layer coextruded thermoplastic multi-layer oriented packaging film wherein the total film thickness ranges from 0.5 to 4 mils (0.0125 to 0.1 mm) consisting of:

(a) a core layer comprising ethylene vinyl alcohol copolymer;

(b) two identical intermediate layers, on opposite surfaces of the core layer, comprising an adhesive;

(c) two identical heat sealable outer layers disposed on respective surfaces of the intermediate layers, opposite the core layer, and comprising a blend of ethylene propylene copolymer and polypropylene

characterised in that the weight percentages of ethylene propylene copolymer and polypropylene in the outer layers are selected to provide a shrink film having longitudinal and transverse free shrink of at least 17% at 93°C (200°F)."

V. The Appellant argued essentially as follows;

Novelty

The laminate of the invention was not anticipated by the disclosure of document (1) when the claims were read in combination with the teaching of the description. Although claim 5 related to a 5-layered laminate by virtue of the combination of the two outer layers of a 7-layered laminate this had to be read only

in conjunction with relevant enabling parts of the description and it was not possible to take any feature at will from any part of the description. This resulted in a non-enabling disclosure in document (1) of a 5-layered laminate.

The teaching of document (1) was in contradiction with that of the application because the citation had primarily to do with thermo-fixed oriented films and layer B, an essential feature of the application, was only an optional feature of the laminate of document (1). The disclosure in document (1) concerning combined layers A (thin) and B (thick) was such that the proportions of the polypropylene and ethylene-propylene copolymer would not lead to a laminate which was heat sealable or shrinkable.

A limitation of the main claim of any of the requests by inclusion of the specific range given in claim 3 for the polymer mix in the outer layer amounted to a restriction which was unfair to the Appellant and therefore the functional features included in the requests were allowable in view of Appeal Board decision T 68/85 (OJ EPO 1987, 228) at paragraphs 8.4.2. and 8.4.3.

Accordingly for these reasons the main claim of each request was novel. When questioned by the Board during oral proceedings whether there were any differences in the total thicknesses of the films to be compared, the Appellant made no comments.

Inventive step

Ex post facto considerations should be avoided. Whilst document (1) disclosed a 7-layer laminate ABCDCBA which could be formed into a 5-layer laminate by combination

of the two sets of outside layers A and B, or by combination of inner layers B and C, there was no teaching that any combination would lead to the laminates of the application having the required shrink and heat-sealable properties. There was no reason given in document (1) why a skilled person would choose particular polymers for layers A and B and combine them in the necessary proportions required by the application because the disclosure in document (1) led to too much polypropylene in the combined layers A and B. The citation at pages 9 and 11 gave various compositions for layers B and A respectively and the disclosure did not lead the skilled person to a satisfactory shrink film.

The problem of the application was to produce a 5-layer film having the required shrinkability and this was admitted to be disclosed in document (1) but not how to solve said problem as there was no incentive to move away from the combination of a thick layer B plus a thin layer A to give a thin layer B and thick layer A, which would result in a laminate having the desirable shrink and heat-sealable properties.

The disclosure of document (1) was not such that it taught a shrink film having at least 17% shrinkability, and there were no indications as to how much shrinkability was associated with any particular combination of layers. There was no instruction to combine polypropylene with ethylene-propylene copolymer in a single layer and there was no reason why the skilled person would do so. Board of Appeal decision T 204/90 of 30 July 1991 was quoted in this respect.

In the Appellant's view the subject matter of all the requests was inventive.

VI. The Appellant requested that the decision of the Examining Division be set aside and that a patent be granted on the basis of the main request filed on 16 July 1996 or any of the three auxiliary requests taken in order and filed during the oral proceedings before the Board.

Reasons for the Decision

1. The appeal is admissible.

2. The description and claims according to the main as well as all three auxiliary requests comply with Article 123(2) EPC as they contain no subject-matter extending beyond the content of the application as filed.

3. *Novelty (Article 54 EPC)*

Main and auxiliary requests

In its decision the Examining Division stated that the thickness of the total laminate was anticipated by document (1) where a range of 10 to 100µm was disclosed. The Board has calculated that the range of 0,5 to 4 mils, being a feature of the main claim of each request, distinguishes the claimed subject-matter from the prior art because 1 mil = 0,04µm, hence the laminates as claimed are only 0,02 to 0,16µm thick. It can be seen that the difference in thickness is very significant and a factor of approximately 62,5 is

involved when comparison of the 10µm thinnest film of the prior art is made with the 0,16µm thickest film of the application. For this reason the subject-matter of the claims of all requests fulfil the requirements of Article 54 EPC.

4. *Inventive Step (Article 56 EPC).*

Main and auxiliary requests

4.1 The closest prior art

Document (1) is regarded by the Board as closest relevant prior art. It relates to gas-barrier multilayered symmetrical laminates (see page 5 lines 9 to 17) having shrink and seal characteristics, whereby the inner layer is the gas barrier layer and the two respective outer layers consist of a mixture of ethylene-propylene copolymer (see page 11, lines 7 and 8) and polypropylene polymer (see page 9, lines 18 to 22).

4.2 The technical problem to be solved

It was agreed by the Appellant at oral proceedings that having regard to document (1) the problem to be solved was to provide a gas-barrier laminate having improved shrink properties.

4.3 The solution to the problem

The Board is satisfied that the problem has been solved by the laminates claimed in the four requests now on file.

4.4 Assessment of inventive step

4.4.1 The claims of all requests contain features of a functional nature, in particular,

(a) the main request refers to "shrink" film,

(b) the first auxiliary request refers to "the weight percentages of ethylene-propylene copolymer and polypropylene in the outer layers are selected to provide a shrink film having longitudinal and transverse free shrink of at least 17% at 93°C",

(c) the second auxiliary request refers to " a shrink film having longitudinal and transverse free shrink of at least 17% at 93°C" with the added characteristic that the two identical outer layers are "heat-sealable",

(d) the third auxiliary request refers to a combination of the feature in (b) above plus a reference to "heat-sealable" outer layers.

4.4.2 It was repeatedly the Appellant's argument that there was no teaching in document (1) which enabled the skilled person to prepare a shrink film laminate as represented by the Appellant's claims. In particular those parts of the disclosure which related to a combination of layers A and B to give a 5-layer laminate did not result in a laminate film having the required shrink or shrink and heat-seal characteristics as the proportions of the polymers of the outer layers were different from those of the application and there

was no incentive to change them in the way now proposed by the application. In particular it was argued that the teaching of claim 5 has to be seen as an unallowable combination of single features of foregoing claims on which claim 5 is dependant.

4.4.3 The Board cannot agree to this position. A claim incorporating foregoing claims by dependencies has to be read as if all technical features of those claims were written in this claim. This means that there is no unallowed combination of lists of other features but rather that all these features are combined in the dependent claims. Claim 5 of document (1) thus discloses a 5-layered laminate which is sealable (claim 1), shows an inner gas barrier layer (claim 1), is biaxially oriented (claim 1), shows two additional layers which are symmetrically layered upon the inner layer (claim 4) and wherein the inner oxygen barrier layer is an ethylene vinyl acetate copolymer (claim 1), the outer layer is a polypropylene monopolymer (claim 1) and the intermediate layer is an adhesive layer (claim 1). Claim 5 then specifies that the outer layer is a mixture of polypropylene monopolymers. According to the description (page 9, lines 18 to 27) this layer may be a mixture of copolymers comprising polypropylene and ethylene propylene copolymer. This is an unambiguous disclosure of the features of claim 1 of all requests.

4.4.4 The definitions of the required shrinkability in the functional features of claims 1 of all the requests relate to different degrees of shrinkability, all of which are attained in the same way by controlling the polymer content of the layers A and B. Document (1) refers to shrinkability at page 15 line 25 and the skilled person would know that this characteristic is dependent upon the constitution of the layers of the

laminates. It is also evident and well known in the art that laminates which have been stretched during their process of manufacture possess a capacity to shrink. The process of manufacture disclosed in document (1) (see page 14 line 6 to page 15 line 26) makes it clear that a thermo-fixation step is an optional feature, thus the process steps of the prior art lead to a laminate with shrink potential.

4.4.5 Heat-sealability is also a known characteristic of the laminates of document (1), (see page 4 lines 19 and 20) and is due to the polymers of layer B. As already stated above, document (1) discloses at page 5 line 17 that layers A and B may be combined, at page 9 lines 20 to 23 that the layer B may be polypropylene and at page 11 lines 7 to 8 that the layer A may be an ethylene-propylene copolymer. Accordingly the two polymers which characterise the outer layer of the heat sealable laminate of the application are obviously derivable from the prior art.

4.4.6 The Appellant argued at oral proceedings that the proportion of the polypropylene and the ethylene-propylene copolymer was of significance. However, this is not a feature of the claims in technical terms but rather in functional terms (see point 4.4.1 above, feature (b). The claims 1 of the requests now on file do not specify any quantity of the polymers present in the combined layer AB. They are characterised only in that they result in a shrink- or shrink-heat-sealable-laminate and therefore indicate no specific values different from those given in document(1). It was obvious to investigate these values in a conventional way.

4.4.7 In the Board's opinion it would be obvious for a skilled person to use varying proportions of known polymers for outer layers with a reasonable expectation of obtaining better shrink or shrink and heat-seal characteristics for the laminate. This is because shrinkability is due to these layers and thus the work necessary would involve only conventional trial and error experimentation without employing skills beyond common general knowledge. The finding that work, involving mere routine experiments, lacks an inventive step is in agreement with Board of Appeal Decision T 60/89 (OJ 1992 268 at points 3.2.5. and 3.2.6.).

4.4.8 Because each main claim of each request is of a functional nature which is solved by optimisation of the components of the outer layers, the claims of all the requests, main and auxiliary, are considered to relate to obvious solutions to the problem to be solved, and thus do not fulfil the requirements of Article 56 EPC and no request is allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairwoman:

L. P. McGarry U. M. Kinkeldey