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Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

Aktenzeichen / Case Number / N° du recours : T 502/89 - 3.3.2

Anmeldenummer / Filing No / N° de la demande : 83 300 796.6

Veröffentlichungs-Nr. / Publication No / N° de la publication : 0 088 535

Bezeichnung der Erfindung: Oriented multilayer heat sealable packaging film and method of forming same
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : B32B 27/08

ENTSCHEIDUNG / DECISION

vom / of / du 3 December 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : Mobil Oil Corporation

Einsprechender / Opponent / Opposant : Hoechst Aktiengesellschaft

Stichwort / Headword / Référence : Heat Sealable Film/MOBIL

EPÜ / EPC / CBE Art. 56

Schlagwort / Keyword / Mot clé : "Inventive step (confirmed) - Late filed document admitted - Reassessment of the state of the art"

Leitsatz / Headnote / Sommaire

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Case Number : T 502 /89 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 3 December 1990

Appellant : (Opponent)
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Decision under appeal : **Decision of Opposition Division of the European Patent Office dated** 11 April 1989, posted on 7 June 1989, **rejecting the opposition filed against European patent No.** 0 088 535 **pursuant to Article 102(2) EPC.**

Composition of the Board :

Chairman : A. Nuss
Members : I.A. Holliday
M. Aúz Castro

Summary of Facts and Submissions

I. European patent No. 0 088 535 concerning an oriented multilayer heat sealable packaging film and method of forming same was granted on the basis of 14 claims contained in European patent application No. 83 300 796.6.

II. The Appellant filed a notice of opposition against the European patent requesting revocation of the patent on the grounds that its subject-matter lacked an inventive step.

Six prior art documents were cited in support of the opposition of which the following remain relevant in this appeal:

(1) US-A-4 214 039
(2) US-A-4 132 050
(3) DE-A-1 691 694
(5) DE-A-1 769 028,
whereby the Respondent relied on GB-A-1 222 622 (5a), an application having priority based on (5).

III. The Opposition Division rejected the opposition, taking the view that the skilled person aware of document (1) or (2) and wishing to improve in the known laminated structures the adhesion between the heat sealable layer and the polyolefin substrate, would not consider the random copolymer of ethylene and propylene described in (3) to be suitable for solving this problem. The said copolymer was used in (3) as a heat sealable thermoplastic layer replacing other known materials. In addition, the skilled person would not consider combining the teachings of documents (3) and (5) since according to the latter no primer layer is deemed necessary. Such a layer could not, therefore, be expected to improve the adhesion.

IV. The Appellant lodged an appeal against this decision in which it was sought to introduce a further document into the procedure, viz.

(7) GB-A-1 134 876.

The arguments of the Appellant, both in the written procedure and at the oral proceedings on 3 December 1990 may be summarised as follows.

The Appellant argued that the closest prior art was not document (1) as maintained by the Opposition Division but document (2) or more clearly document (7). According to Example 5 of the latter, a heat seal layer was actually applied with an intervening primer layer to an ethylene/propylene copolymer falling within the definition of Claim 1 of the patent in suit. A combination of the teachings of either (2) or (7) with (5) would lead in an obvious manner to the multilayer structure of Claim 1 of the disputed patent. An alternative attack was mounted by combining the teachings of documents (1) and (3).

The Appellant also questioned the validity of Example 3 of the disputed patent which was intended as a comparison.

V. The Respondent (Proprietor of the patent) asked that document (7) be disregarded since it was not filed to rebut a new argument. In addition (7) was considered to be less relevant than either (1) or (2). The Respondent maintained that (1) should continue to be regarded as closest prior art since it used polypropylene, the preferred substrate of the claimed invention together with the preferred primer of the present invention. Document (2) uses as substrate polypropylene blended with a block copolymer in contradistinction to the random copolymer

used in the disputed patent. As to document (7), it does not disclose the preferred primer and, insofar as it discloses copolymer, this is a substrate which is not preferred.

The Respondent has also filed an affidavit from one of the inventors to rebut the Appellant's argument concerning Example 3 of the disputed patent.

At the oral proceedings, the Respondent requested an amendment to Claim 1 to introduce the word "coextruded" into item (b) of Claim 1. This would bring Claim 1 into agreement with process Claim 12 and with the statement of invention in column 1 of the description.

VII. Claim 1 as amended at the oral proceedings reads as follows:

"1. An oriented multilayer heat sealable structure comprising:
(a) a substrate comprising a polyolefin film;
(b) a coextruded layer on at least one surface of (a), the layer consisting essentially of a random copolymer of ethylene and propylene, the copolymer containing from 0.5 to 6% by weight of ethylene;
(c) a primer coating on at least one layer (b); and
(d) a heat sealable layer on coating (c), the heat sealable layer comprising a vinylidene chloride copolymer containing at least 50% by weight of vinylidene chloride."

Claims 2 to 10 are dependent product claims. Claim 11 relates to a method of wrapping merchandise using a heat sealable structure according to the invention. Independent

Claims 12 and 13 relate to methods of preparing the multiply heat sealable structure. Claim 14 is dependent upon Claim 13.

VIII. The Appellant requests that the appealed decision be set aside and that the patent be revoked in its entirety.

The Respondent requests that the patent be maintained on the basis of Claim 1 as amended at the oral proceedings on 3 December 1990 and Claims 2 to 14 as granted.

Reasons for the Decision

1. The appeal is admissible.

2. Amendments

2.1 The amendment to Claim 1 is based on the description at column 1, line 54 of the printed patent specification (page 2, line 7 of the application documents). The amendment is also a restriction on the scope of Claim 1. The requirements of Articles 123(2) and 123(3) are accordingly satisfied.

2.2 The Appellant has objected that the affidavit from the inventor and statements by the Respondent both during the opposition and appeal procedure represent a violation of Article 123. The Appellant made the point that in Example 3 of the disputed patent no corona discharge was applied to the polypropylene film thus rendering the comparison with Example 2 invalid. The Respondent has denied this allegation both in oral proceedings before the Opposition Division and in the affidavit filed with the response to the statement of appeal and dated 17 April 1990. However, no amendment to the actual patent

specification has either been requested or made. As the Respondent correctly pointed out at oral proceedings before the Board, Article 123 EPC is exclusively concerned with amendments. Since no amendment has been made in respect of Example 3, Article 123 cannot have been violated. The question of the validity of the contested example for comparative purposes is quite a different question, namely that of inventive step and will therefore be examined later by the Board.

3. Admissibility of late filed documents

The Board has considered whether it should disregard document (7) in accordance with Article 114(2) EPC. However, the Board is inclined to accept the arguments of the Appellant concerning its relevance. Of the documents cited only (7) discloses, as is the case with the patent in suit, the affixing of a primer layer and then a heat sealing layer based on a vinylidene chloride polymer to a copolymer of ethylene and propylene (page 2, lines 85 to 89 and Example 5). The Board has accordingly decided to admit the document into the proceedings.

4. The patent in suit is concerned with a multilayer heat sealable structure useful in packaging, its production and use.

4.1 The closest state of the art is now considered to be document (7) which is also concerned with a similar multilayer structure in which a primer layer is applied either to a polypropylene homopolymer or to an ethylene/propylene copolymer. The multilayer structure of (7) consists of a substrate which may be either a polyolefin, e.g. polypropylene or a copolymer, e.g. a copolymer of 94% by weight of propylene and 6% by weight of ethylene (Example 5). The said substrate is treated,

e.g. with corona discharge, to improve its bonding properties (page 2, lines 104 to 106) and a primer is applied. The said primer is based on a condensate of a monoaldehyde with an interpolymer of (meth)acrylamide. To the primer is applied a heat seal layer, a preferred example being an 88:12 vinylidene chloride/acrylonitrile copolymer. Since the patent in suit is not limited to a specific class of primers, the said primer is clearly one of those considered to be suitable for use therein, although not the preferred one. In fact the patent in suit specifically refers to the primers known from (7) (see column 5, lines 1 to 6). In particular the multilayer films known from (7) show a very strong bond, i.e. heat seal strengths of at least 200g/inch (see page 3, lines 104 to 107). As may be seen from Examples 4 and 5, heat seal strengths of 360g/inch may be obtained using as substrates polypropylene and a 94:6 propylene/ethylene copolymer respectively.

However, as stated in the patent in suit, the disadvantage of such a prior art multilayer sheet is that during shipment of products enclosed in such a heat sealed structure, particularly with large size bags, the bags have a tendency to split or burst (see patent in suit, column 1, lines 27 to 30).

4.2 In relation to the above prior art, the problem to be solved by the disputed patent is to improve the heat seal strength of such multilayer heat sealable packaging sheets.

This problem is solved by the oriented multilayer structure according to the present Claim 1.

Having regard to the heat seal strength values which appear in the Tables of the disputed patent, data filed by

the Respondent during the opposition procedure and a comparison with the heat seal strength values which appear in document (7), the Board is satisfied that the problem has been solved in a plausible manner. The Appellant did not question the improvements as such.

5. Novelty

None of the documents cited in the opposition proceedings disclose the specific combination of layers set out in Claim 1; the structure claimed can thus be recognised as new. Since novelty has not been contested, it is not necessary for the Board to investigate the matter any further.

6. Inventive step

6.1 It remains to consider whether or not Claim 1 satisfies the requirements of Article 56 in respect of inventive step.

6.2 The structure defined in Claim 1 of the disputed patent differs from that disclosed in (7) in the presence of an extra layer and consists of: (a) a polyolefin substrate, especially polypropylene; (b) a coextruded layer on at least one surface of (a) of a copolymer of ethylene and propylene containing 0.5 - 6% by weight of ethylene; (c) a primer coating on at least one layer (b); (d) a heat sealable layer on (c) based on a vinylidene chloride polymer as defined above. As indicated above (see point 4.1), the primer may be that known from (7) although other primers such as the reaction product of an epoxy resin and an acidified aminoethylated vinyl polymer may be used as alternatives.

6.2.1 The Appellant has argued that the use of the additional layer (b) would have been obvious from the teaching of document (5) which also relates to a multilayer structure. The layers of (5) are: (a) isotactic polypropylene; (b) isotactic polypropylene, a mixture of isotactic with up to 15 weight % of atactic polypropylene or a copolymer of propylene with up to 15 weight % of ethylene; and (c) a heat seal layer, e.g. a 90:10 vinylidene chloride/acrylonitrile copolymer. The layer (b), as in the process of the disputed patent, may be treated with corona discharge but no primer layer is employed. Thus, the use of an ethylene/propylene copolymer is merely one of the alternatives used as the layer interposed between the polypropylene and the heat seal layer. No such copolymer is used in the worked examples of (5). However, in Example 6 of (5a), such a copolymer is employed. The said copolymer, however, falls outside the definition of Claim 1 of the patent in suit since it is based on 7% by weight of ethylene and 93% by weight of propylene. It is to be noted that the heat seal strength measured in (5a) for the product of Example 6 is of the same order (100-150g/cm) but somewhat inferior to values measured using other layers, defined in accordance with (b) of Claim 1 of document (5) above (up to 160g/cm), in contact with the heat seal layer. Thus, from (5) or (5a) there would be no incentive for the skilled man to use the specific order of layers, including the copolymer layer, as defined by Claim 1 of the patent in suit, especially since (5) states specifically in the sentence bridging pages 7 and 8 (original pagination) that the use of a primer layer is unnecessary.

6.2.2 The results quoted in (7) also give no incentive to use a copolymer layer together with the heat seal layer. The heat seal values given for Example 5, which uses a 94:6 propylene/ethylene copolymer (presumably random) as

substrate are exactly the same as those obtained where polypropylene homopolymer is used as the substrate. Thus, no improvement would be expected from a combined polypropylene/ethylene-propylene copolymer layer.

6.2.3 The heat seal strengths which appear in Table II of the disputed patent for Example 2 according to the invention are signficantly higher (560g/in or 220g/cm) than recorded in 7 and mentioned in point 4.1 above. The parties did not contest that the results are comparable; indeed both refer to sealing at about 130°C using a pressure of about 34 kPa (5 p.s.i.).

6.3 A similar result would be obtained starting from document (1) in which the preferred primer of the disputed patent (see point 6.2 above) is applied to a thermoplastic film, especially polypropylene which has been treated with corona discharge, and a heat seal layer based on a vinylidene chloride polymer is applied thereto; i.e. the copolymer layer (b) of Claim 1 of the disputed patent is missing. The Board can see no incentive from (3) to use the ethylene/propylene copolymer disclosed therein for such a purpose; the teaching of (3) is to use the ethylene/propylene copolymer as an alternative heat seal layer, i.e. as a replacement for the vinylidene chloride polymer not as an alternative substrate in relation thereto. There would also be no incentive from (7), having regard to the heat seal tests mentioned in point 6.2.2 above, to interpose an ethylene/propylene copolymer between the polypropylene and primer layers.

6.4 In the absence of adequate evidence, the Board can see no objection to Example 3 of the disputed patent as alleged by the Appellant and can therefore accept the statement by one of the co-inventors in the affidavit submitted to the Board that a corona discharge had been applied to the

substrate in all three examples of the patent; otherwise the test would indeed be meaningless as a comparison. It is moreover apparent from the prior art cited, e.g. (1), column 6, lines 2 to 6; (2), column 5, lines 12 to 14; (3), page 1, lines 70 to 88; (5), page 2, lines 120 to 125; and (7), page 2, lines 104 to 115, that corona discharge treatment is consistently used in such processes where other layers are applied to polyolefins in order that the said coating will adhere to the substrate. In any event, Example 3 is not a direct comparison with any prior art cited during the opposition proceedings and therefore of no importance for assessing the relevance thereof. The blends of document (2) use a specific ethylene/propylene block copolymer having in addition a degree of random structure. A comparison between Examples 2 and 3 merely indicates that by interposing a layer of ethylene/propylene random copolymer between the polypropylene and the primer, vastly superior heat seal properties are obtained than when equivalent copolymer is blended with the polypropylene and the resultant blend is used as substrate. Moreover, the results of Example 3 are fully in line with the previous findings, namely that no superior effect is to be expected from a random copolymer of propylene and ethylene.

6.5 It follows from the preceding paragraphs that the subject-matter of Claim 1 is not foreshadowed by the documents cited by the Appellant. Consequently, it involves an inventive step.

The same applies to Claims 2 to 10 which involve particular embodiments of the structure according to Claim 1 and also to the method of packaging referred to in Claim 10; it is uncontested that the problem of heat seal strength solved by the invention is of particular importance in packaging.

7. The above findings also show that the method according to Claims 12, 13 and 14 are in no way rendered obvious by the documents on which the Appellant relied. Consequently, these claims also involve an inventive step, especially since the Appellant has made no specific attack on the method claims during the appeal proceedings.

8. Accordingly, there are no grounds which prejudice the maintenance of the patent in the form proposed by the Respondent at the oral proceedings on 3 December 1990.

Order

For these reasons, it is decided that:

1. The decision of the first instance is set aside.

2. The case is remitted to the department of the first instance with the order that European patent No. 0 088 535 be maintained with the amendment requested by the Respondent during oral proceedings.

The Registrar: The Chairman:

M. Beer A. Nuss