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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention : Coextruded thermoplastic stretch-wrap

Klassifikation / Classification / Classement : B32B 27/32

ENTSCHEIDUNG / DECISION

vom / of / du 16 January 1990

Anmelder / Applicant / Demandeur :

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

Einsprechender / Opponent / Opposant : 01) Naamloze Vennootschap DSM
02) BP Chemicals Limited

Stichwort / Headword / Référence : Film/MOBIL OIL

EPÜ / EPC / CBE Articles 54, 56

Schlagwort / Keyword / Mot clé : "Novelty (affirmed)" - "Inventive step (affirmed)" - "in-house prior art, reassessment"

Leitsatz / Headnote / Sommaire

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Case Number : T 405/86 - 3.3.2

D E C I S I O N
of the Technical Board of Appeal 3.3.2
of 16 January 1990

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Decision under appeal :
Interlocutory decision of the Opposition Division of the European Patent Office dated 16 September 1986, concerning maintenance of European patent No. 0 009 376 in amended form.

Composition of the Board :

Chairman : P. Lançon
Members : S. Schödel
R. Schulte

Summary of Facts and Submissions

I. European patent 9376 was granted with three claims on 3 August 1983 in response to European patent application No. 79 301 889.6 filed on 14 September 1979.

II. Notices of opposition were filed by the Appellants requesting revocation of the patent on the grounds that its subject-matter was not novel and did not involve an inventive step. In support of their divergent positions the parties cited several documents including

(c) DE-A-2 609 527
(d) DE-A-2 803 598
(i) CA-A-829 797
(k) GB-A-1 368 634 and
(o) "Modern Packaging", 5/1978, 55 to 58,

which are relevant to the present decision.

In order to overcome an Article 123 objection raised by the Appellants a new set of claims was presented on 21 April 1986. The claims were worded as follows:

"1. A laminar thermoplastic film adapted for use as a stretch-wrap film and comprising a layer of a linear, low-density copolymer of ethylene with a minor amount of another alpha-olefin, laminated to at least one layer of a branched-chain, low density ethylene polymer.

2. A film according to Claim 1 in which the linear, low-density copolymer forms a core layer laminated on each side to a surface layer of the branched-chain, low-density

polymer, each surface layer constituting 5-40% of the thickness of the laminate.

3. A film according to Claim 1 or 2 in which the other alpha-olefin comprises octene-1, 4-methyl-pentene-1 or butene-1."

III. In the decision of 16 September 1986 the Opposition Division acknowledged that the claimed subject-matter was new and involved an inventive step and maintained the patent in amended form on the basis of the aforementioned three claims.

The Opposition Division held that films resulting from copolymers of ethylene and higher alpha-olefins with better physical properties than those made from conventional polyethylenes had already been known (c; d; i; k). It had also been suggested in the prior art that such copolymers could be used in multi-layered films, although the nature of the other film materials was not disclosed (d; i). It was not clear from (i) whether the copolymers from (i) were linear. None of the documents cited by the Opponents was concerned with stretch-wrap.

The two-ply and three-ply laminates described in (k) did not satisfy the density criteria laid down in Claim 1 of the patent in suit when read in conjunction with the description.

It had to be regarded as doubtful whether low-density polyethylene would have been chosen as the film to which the ethylene alkene-1 copolymer might be laminated, since the latter film itself had satisfactory properties. This would also be an argument against combining the teachings of (i) and (k).

IV. Notices of appeal were lodged by the Appellants on 6 and 7 November 1986 and the appeal fees were paid on the same dates. Statements of grounds were submitted in due time.

V. In their written submissions the Appellants argued essentially as follows:

In view of (k), Example 6, the laminated film specified in the present Claim 1 lacked novelty. The value 0.945 assigned to the density of the copolymer in Example 6 - the only critical parameter - was well below the high-density range defined on page 2, lines 6 to 11 of (k), i.e. that value must be considered as low density. Thus, all the relevant parameters claimed were known from the prior art.

Stretch-wrap materials of good quality such as laminar stretch film M, comprising two layers of high pressure (low-density) polyethylene (LDPE), had already been available before the priority date of the patent in suit (cf. the present description).

Films made from linear low density ethylene-alkene-1 copolymers (LLDPE) exhibited better tear strength, tensile strength, elongation values, puncture resistance, impact strength, etc., than LDPE films (cf (c), (d), (i)). These very properties were highly desirable for stretch-wrap materials. The use of LLDPE in multilayer applications was mentioned in (d) and (i).

Replacing one of the two layers, i.e. the "core" layer, of film M by a LLDPE copolymer was an obvious expedient. The laminate formed by putting together LLDPE and LDPE merely had the aggregate properties of the individual layers. Also, the gloss and cling properties tabulated in the

patent in suit did not reveal any surprising effect (cf. Table 3).

In their counterstatement the Respondents contested the Appellants' pleadings.

VI. In the communication dated 23 November 1989 under Article 110(2) EPC, which accompanied the summons to oral proceedings, the parties were informed that when evaluating inventive step film M as mentioned in the present description would be considered as the closest state of the art; reference was also made, inter alia, to (o). Further, it was pointed out that the novelty objection based on Example 6 of (k) did not seem convincing. This document related to a heat sealable, linear, medium-density ethylene-butene-1 copolymer (LMDPE)/(branched) LDPE film and not to the LLDPE/LDPE film of the present Claim 1.

VII. Oral proceedings took place before the Board on 16 January 1990. The Appellants, as previously announced, did not attend.

At this hearing the Respondents argued substantially as follows:

Contrary to the Board's suggestion film M could not be considered as the closest state of the art. Although film M had been marketed before the priority date of the patent in suit, none of the relevant data in the present specification had been available to the public. The Appellants' assumptions in this respect were therefore unwarranted.

In review article (o), inter alia, LDPE was described as a stretch-wrap material with a variety of good properties which could be improved by blending with ethylene-vinyl

acetate (EVA). Laminates were not mentioned in the text of this article.

Documents (b), (c), (d) and (i) all disclosed LLDPE, which have good working characteristics, but none of these related to stretch-wrapping.

It had proved impossible to produce thin films from LLDPE on its own. No such problems arose when LLDPE was processed with LDPE and the resulting laminate had a greatly increased tear strength in the transverse direction (TD). This was unexpected.

The invention was thus considered to be patentable.

VIII. At the end of the oral proceedings the Respondents requested that the appeals be dismissed.

From the written submissions it was clear that both Appellants requested that the decision under appeal be set aside and the patent be revoked.

Reasons for the Decision

1. The appeals comply with Articles 106 to 108 and Rule 64 EPC and are therefore admissible.

2. There is no formal objection to the present statement of claim under Article 123(2) and (3) EPC.

Claim 2 differs from the granted Claim 2 in that the term "copolymer" associated with the definition of the surface layer was replaced by the term "polymer", an amendment supported by the description as originally filed and by

the published patent specification (cf. original Claim 2; page 2, lines 58-59). Claims 1 and 3 remained unchanged.

3. The patent in suit relates to thermoplastic film laminates intended for use in stretch-wrap packaging applications.

3.1 Stretch wrapping has two main applications: pallet overwrapping and food wrapping. The most common method, using stretch films for overwrap packaging of goods, is to locate the pallet load on a turntable. As the pallet load rotates, a film applied to it from a continuous roll is continuously stretched and pulled around it. On completion of the overwrap operation the film is cut and attached to the previous layer. If a problem is caused by surface tack or cling, i.e. the property that makes the film adhere to itself, the film is sealed with heat or adhesives. When food products are wrapped the film is generally prestretched in both machine direction (MD) and transverse direction (TD) and the product then pushed through the film, which is stretched tightly over the top.

3.2 According to the Respondents' plead, the essence of which must be accepted by the Board for lack of counter-arguments, a stretch-wrap film based on PE and identified in the present description as film M "was commercially available" before the priority date of the patent in suit, i.e. the film per se, its use, its properties and the chemical nature of the basic material were known.

The same does not apply in further respects, however. The fact that film M was a laminate comprising two LDPE layers, each having a specific density and a specific melting index (MI), was not known. Once the starting materials had been subjected to lamination, details of the layout of the resulting film or of parameters inherent in the individual

LDPE resins could no longer be determined, e.g. analytically, from the flimsy finished product, i.e. any knowledge of the specific PE resins which had to be processed to arrive at film M was not available to the public at that time. This in-house knowledge is regarded as not being comprised in the state of the art under Article 54 EPC and should therefore be excluded from considerations relating to novelty and inventive step (in-house prior art).

Thus, the Board agrees that document (o) should be considered as the closest state of the art instead of film M as provisionally concluded in the communication dated 23 November 1989.

Document (o) considers various types of packaging with thermoplastic stretch materials, such as LDPE films. Physical properties of particular significance for the successful use of such films in stretch-wrap applications include e.g. puncture and tear resistance, tensile strength in both MD and TD, elongation, stress retention, rate of relaxation, surface cling and optical properties. According to both this document and the patent in suit, some of these characteristics seem to be in need of improvement (cf. patent in suit, page 2; (o), page 56, top left).

4. The technical problem underlying the patent in suit vis-à-vis this prior art can be seen in providing a stretch-wrap film material based on LDPE having improved working characteristics.

The solution to this problem is outlined in more detail in the present Claims 1 and 2 and consists essentially in a film of laminar structure comprising a primary (core) layer of an LLDPE copolymer with an LDPE (skin) coating on at least one side.

Although no example of an embodiment of the present Claim 1 exists on file, the statements in the description lend plausibility to the assertion that the aim can be achieved by the means claimed. Table 3 of the patent in suit sets forth the physical properties of films X-1, X-2 and X-3, which are three-ply laminates of the preferred type claimed (skin-core-skin-type). When compared with those of film M, which is a two-ply laminate, most of the characteristics represent an improvement; as far as properties such as gloss and surface cling are concerned, a reasonable standard is maintained. No objections were raised to this line of argument by either the Opposition Division or the Appellants. In the circumstances of the case the Board sees no reason to express any reservations in this respect either.

5. As to the novelty objection based on (k) the Appellants have failed to rebut the Board's provisional opinion on that point notified in the communication dated 23 November 1989. The Board therefore maintains the grounds set out in sections VI and also III to the effect that the subject-matter of the present Claim 1 is considered novel. Accordingly, Claim 1 of the patent in suit is acceptable under Article 54 EPC.

6. Turning now to inventive step it has to be established whether the claimed solution to the technical problem was obvious in the light of the cited prior art.

6.1 Review article (o) says little about how to improve the quality of the stretch-films referred to. For greater surface tack and improved puncture resistance it is recommended that the LDPE resin be blended with EVA (cf. page 57, middle column). Nothing in the text of this

document points to films of laminar structure. Stretch-wrapping machinery is advertised on page 58 and it is alleged that low operating costs are achieved by using "..economical single or double-ply PE film..". Particular film materials to be used for this purpose are not indicated.

6.2 Films manufactured from LLDPE and suitable for wrapping irregularly shaped articles are described in (i). These combine comparatively high elongation, low tensile modulus, good heat sealing properties, good optical properties and good tack and cling characteristics (cf. Examples 1 and 2).

Considering the balance of desired properties on the one hand and the fact that stretch-wrapping is a low-cost system on the other hand, it would have been quite logical to employ such film per se. According to the Respondents, however, major difficulties arise when LLDPE is processed to produce thin film on a commercial scale. In view of this shortcoming, little importance need be attached to the passing remark in (i) that the LLDPE film should be laminated "to itself or to other films..to give film characteristics for specialised uses" (i, page 4, last paragraph). The practitioner in the field of packaging, confronted with the technical problem referred to above, would not immediately be prompted to combine LLDPE, which is difficult to process, with LDPE in the manner outlined in the present Claim 1 while at the same time specifying additional parameters for obtaining suitable core resins and skin resins (cf. patent in suit, page 4, paragraph 1).

Documents (c) and (d) also relating to LLDPE do not add anything material in this respect.

6.3 Be that as it may, the result achieved with the claimed laminates, the validity of which the Appellants have not disproved, i.e. by submitting counter-evidence, is unexpected. This is true not only of the processibility of the PE resins but also of the excellent overall performance characteristics of the film obtained, in particular the greatly increased tear resistance in TD. The latter property is important for the vertical holding power for stretch-wrapped goods when roughly handled (patent in suit, Table 3; (o), page 58, paragraph 3; T 254/86, OJ EPO 1989, 115).

7. The subject-matter of Claim 1 of the patent under discussion thus clearly involves an inventive step as required by Article 56 EPC and the claim therefore is patentable. The same applies mutatis mutandis to Claims 2 and 3 which relate to further elaborations of the laminates specified in Claim 1.

Order

For these reasons, it is decided that:

The appeals are dismissed.

The Registrar: **The Chairman:**

M. Beer P. Lançon