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D E C I S I O N
of 24 November 1993

Case Number: T 0866/91 - 3.3.3

Application Number: 81305857.5

Publication Number: 0054424

IPC: C08L 23/08

Language of the proceedings: EN

Title of invention:

Thermoplastic polymer composition, products formed therefrom

Patentee:

Lindsay & Williams Limited

Opponent:

Siemens AG

Headword:

-

Relevant legal norms:

EPC Art. 54, 56

Keyword:

"Novelty (confirmed)"

"Inventive step (confirmed)"

Decisions cited:

-

Catchword:

-

Case Number: T 0866/91 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 24 November 1993

Appellant: Siemens AG
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Representative: -

Respondent: Lindsay & Williams Limited
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office dated 3 September
1991 concerning maintenance of European patent
No. 0054424 in amended form.

Composition of the Board:

Chairman: F. Antony
Members: C. Gérardin
M. Aúz Castro

Summary of Facts and Submissions

- I. The mention of the grant of the patent No. 54 424 in respect of European patent application No. 81 305 857.5 filed on 14 December 1981 and claiming the priority of 16 December 1980 from an earlier application in Germany, was published on 29 October 1986 on the basis of 9 claims, Claim 1 reading as follows:

"A fire-retardant, non-halogenated thermoplastic composition consisting essentially of a polymer mixture of ethylene copolymers and a metal hydroxide filler and optionally further fillers and/or additives characterised in that the polymer mixture comprises at least 50% by weight of an elastomer and at most 50% by weight of a plastomer, that the elastomer is an ethylene copolymer with at least 38% by weight consisting of unsaturated ester comonomers, and that the plastomer is an ethylene copolymer with an ethylene portion of at least 70% by weight, and that the metal hydroxide filler is used in an amount of 180 to 320 percent by weight of the polymer mixture."

Claims 2 to 4 were dependent composition claims directed to preferred fire-retardant, non-halogenated thermoplastic compositions according to Claim 1. Further, Claims 5 to 9 concerned various products formed from a composition according to any one of Claims 1 to 4, in particular a cable having sheathing or insulation, a floor covering and a tile.

- II. On 4 May 1987 the Opponent filed a Notice of Opposition against the grant of the patent and requested revocation thereof in its entirety for lack of inventive step under Article 100(a) EPC. In a subsequent written statement the Opponent took the view that the claimed subject-

matter was in fact not novel. These objections, which were emphasised and elaborated in several later submissions, were based essentially on the following document:

(2) Derwent Abstract 56 964X/30

considered in the form of the English translation of the corresponding JP-A-51-67 703 submitted by the Patentee.

III. By an interlocutory decision of 3 September 1991 the Opposition Division held that there were no grounds of opposition to the maintenance of the patent in suit in amended form, the amendments consisting in (i) the requirement that the thermoplastic composition should have a "sufficient mechanical strength for the sheathing or insulation of cables", (ii) the introduction of a range of 5 to 50% by weight to define the amount of plastomer in that mixture, (iii) the indication that the comonomer in the elastomer is vinyl acetate, and (iv) the indication that the comonomer in the plastomer is selected from vinyl acetate, ethyl acrylate or butyl acrylate.

It was first stated in this decision that the claimed compositions were novel, since the patent in suit related basically to a two-component polymer mixture, whereas the compositions disclosed in document (2) required a third polymer component; the latter, which was thus an essential ingredient of the known compositions, could not be equated with the optional additional polymer only mentioned in vague terms in the description of the patent in suit. Moreover, the ethylene/vinyl acetate copolymer according to document (2) had a high melt index which excluded elastomer properties. In view of these compositional differences and the fact that the teaching of this citation was

directed to the preparation of artificial leather sheet material, it was evident that the claimed subject-matter could not derive therefrom and, therefore, involved an inventive step.

IV. The Appellant (Opponent) thereafter filed a Notice of Appeal against this decision on 30 October 1991 and paid the prescribed fee at the same time. In the Statement of Grounds of Appeal filed simultaneously the Appellant concentrated on the objection of lack of novelty with regard to the teaching of document (2); since the description of the patent in suit left open the possibility of incorporating a third polymer component, a correspondence between the prior art compositions and the claimed compositions was possible. Additionally, the Appellant referred to

- (5) Kunststoffe 67 (1977) 3, pages 118 to 121, and
- (6) Ullmanns Encyklopädie der technischen Chemie, 1977, volume 13, page 623,

the latter being cited in a letter received on 28 September 1993 to demonstrate that copolymers of ethylene and vinyl acetate were plastomers when they contained 15 to 30% by weight of vinyl acetate, but elastomers when the content of vinyl acetate was between 40 and 50% by weight. Moreover, document (5) provided evidence that copolymers of ethylene and vinyl acetate containing 40 to 50% by weight of vinyl acetate were suitable for both cable insulation and textile impregnation. It followed that the skilled person would have considered document (2) for the solution of a technical problem dealing with cable insulation.

V. Together with its written statement the Respondent (Patentee) submitted a new document, namely

(7) Kautschuk und Gummi-Kunststoffe (1972), 452 to 455,

wherein it was specified that the melt flow index was an essential parameter which determined whether or not a particular copolymer of ethylene and vinyl acetate could be classed as an elastomer. Without knowledge of that parameter, the elastomer property of the copolymer could thus not be predicted. It followed that document (2) did not disclose a composition containing an elastomer within the terms of the patent in suit.

Apart from these differences in composition, the mixture disclosed in document (2) would not be suitable for sheathing or insulating a cable, for such compositions would be expected to soften appreciably when heated to moderate temperatures and also to demonstrate adhesive properties when hot. That citation related only to leather-like material, not to compositions for cable sheathing or insulation which had to satisfy totally different criteria.

VI. The Appellant requested that the decision under appeal be set aside and the patent be revoked entirely. A previous auxiliary request for oral proceedings was withdrawn on 19 October 1993.

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is admissible.

2. As it appears from the submissions of the parties, a controversial point is the question whether the elastomer properties of ethylene copolymers can be predicted on the sole basis of the amount of vinyl acetate comonomer, as the Appellant contends, or whether the polymer composition is a necessary, but not sufficient condition for such a copolymer to qualify as an elastomer, as alleged by the Respondent.

Document (6) specifies that (i) ethylene copolymers are elastomers when they contain up to 30% of vinyl acetate, (ii) these copolymers are essentially amorphous when they contain from 40 to 75% of vinyl acetate, and (iii) EVA copolymers of high molecular weight have elastomer properties when they contain 40 to 50% of vinyl acetate. It appears thus that, depending upon their molecular weight, copolymers having the same composition, namely a vinyl acetate content in the range from 40 to 50%, have different properties. It follows that the indication of both the comonomer content and the molecular weight - or a parameter closely related thereto, like the melt flow index - is necessary before a conclusion can be drawn about the general properties of ethylene copolymers. Since this point is confirmed in document (7) (page 454, point 4, third paragraph), the Board relies on that information and to that end decides to admit documents (6) and (7) into the procedure (Art. 114(1) EPC).

As far as document (5) is concerned, the passage referred to by the Appellant specifies that ethylene

copolymers containing 40 to 50% by weight of vinyl acetate are suitable for sheathing or insulation of cables and that the hydrolyzed copolymers can be used for coating fibre substrates (page 119, Table 1). Besides the fact that hydrolyzed and non-hydrolyzed copolymers are quite different products, the suitability for these two fields of application does not extend to copolymers having less than 30% by weight of vinyl acetate according to the definition of elastomers in the patent in suit; moreover, the Appellant failed to demonstrate how a teaching valid for one polymer component can be extended to compositions containing a metal hydroxide as major component. Document (5) consequently does not add anything to the information made available by the prior art submitted in due time, i.e. within the nine-month opposition period according to the provisions of Article 99(1) EPC, and will thus be disregarded hereinafter pursuant to Article 114(2) EPC.

3. The wording of the claims does not give rise to any objections under Article 123 EPC.

As stated in point III above, the version of Claim 1 as amended in opposition procedure differs from the main claim as granted in four respects. Amendment (i), i.e. the requirement that the thermoplastic composition should have a "sufficient mechanical strength for the sheathing or insulation of cables", can be inferred, on the one hand, from the need to provide a polymer composition having high mechanical strength, which is mentioned in column 1, lines 55 to 59, column 2, lines 60 to 63 and column 5, lines 9 to 12 of the patent as granted, corresponding to page 2, lines 10 to 14, page 4, lines 23 to 26 and page 9, lines 24 to 27 of the application as originally filed, and, on the other hand, from the suitability of this composition for sheathing and insulation of cables, which is mentioned in

column 2, lines 20 to 22 and column 5, lines 21 to 28 of the patent as granted corresponding to page 3, lines 13 to 15 and page 10, lines 9 to 15 of the application as originally filed. Amendment (ii), i.e. the introduction of a lower limit of 5% of the amount of plastomer in the polymer mixture, corresponds to the preferred embodiment, as specified in column 2, lines 63 to 65 of the patent as granted corresponding to page 4, lines 26 to 28 of the application as originally filed. Amendment (iii), i.e. the use of vinyl acetate as comonomer in the elastomer, is the subject-matter of Claim 2 as granted and originally filed. Similarly, amendment (iv), i.e. the selection of vinyl acetate, ethyl acrylate or butyl acrylate as comonomer in the plastomer, is the subject-matter of Claim 3 as granted and originally filed. It is evident that all these amendments result in a narrower definition of the claimed subject-matter.

As far as dependent Claims 2 to 7 are concerned, they correspond to Claims 4 to 9 as granted with their numbers and appendancies adjusted.

4. The Appellant has raised an objection of lack of novelty on the basis of the teaching of document (2).
- 4.1 This citation describes a resin composition containing (a) 5 to 75 parts by weight of an ethylene-propylene copolymer in the weight ratio 70:30 to 90:10, (b) 5 to 90 parts by weight of an ethylene-vinyl acetate copolymer with a monomer weight ratio 70:30 to 85:15, (c) 5 to 75 parts of an ethylene-vinyl acetate copolymer with a monomer weight ratio 50:50 to 70:30, the total resin weight corresponding to 100 parts, and (d) 50 to 500 parts by weight of a water-containing filler, in which the bound water content per mole is at least 10% by weight and the bound water decomposition temperature is 175 to 800°C (claim and page 5, paragraph 4). In the

above definition of component (b) the upper limit of vinyl acetate content has been amended from 80, the value actually disclosed, into 30; this correction is obvious in view of other passages in this citation (page 4, paragraph 3; page 6, paragraph 3 and page 7, paragraph 1) as well as the corresponding abstract originally cited, and is not a matter of dispute between the parties. The most suitable filler (d) is said to be aluminium hydroxide (page 7, paragraph 3 to page 8, paragraph 1), which corresponds to the compound used in all the examples of the patent in suit.

- 4.2 The first point to be examined is whether component (c) can be regarded as an elastomer within the meaning of the patent in suit.

Component (c) is further defined as having preferably a melt index of 50 to 100 (page 6, paragraph 3). As correctly pointed out by the Respondent (Counterstatement of Appeal, points 2.2 to 2.4), such high values are indicative of low molecular weights, which in view of the teaching of documents (6) and (7) excludes elastomer properties. This is confirmed by the fact that component (c) is said to act as a plasticizer, whereas components (a) and (b) are the essential ingredients of the resin composition (page 6, paragraph 4). It follows that the ethylene copolymer with a relatively high amount of vinyl acetate comonomer in the patent in suit can be distinguished from the corresponding component in document (2), i.e. component (c), on the basis of its elastomer properties.

- 4.3 A further difference is the compulsory presence of three polymer components in the prior art composition.

From the general definition thereof it appears that the first component is an ethylene-propylene copolymer with

a monomer weight ratio 70:30 to 90:10, which, as noted above, is in fact an essential ingredient of this composition (page 6, paragraph 2). It is not only important in terms of quantity, since it can represent up to 75% by weight of the total resin, but above all for the general properties and, thereby, for the application of this resin, as will appear hereinbelow in connection with the issue of inventive step.

It is not disputed that further polymers referred to as "additional polymers" may be incorporated as well in the compositions according to the patent in suit (column 5, lines 6 to 9). These polymers are generally defined as additives, which means that they must be regarded as minor ingredients of the claimed compositions; this is best illustrated in Example 3, wherein 2 parts of polycarbodiimide are added together with one part of an antioxidant and one part of pigment to the basic thermoplastic composition containing 60 parts of elastomer, 40 parts of plastomer and 200 parts of aluminium hydroxide. Such minor amounts of optional polymer additives can obviously not be equated with the mandatory component (a) in document (2).

4.4 To sum up, in contradistinction to the known compositions, which are ternary polymer mixtures wherein the ethylene-vinyl acetate copolymer having the higher amount of vinyl acetate comonomer acts as a low molecular weight plasticizer, the claimed compositions are basically binary polymer mixtures wherein the ethylene-vinyl acetate copolymer having the higher amount of vinyl acetate comonomer is present as a high molecular weight elastomer. Novelty of the claimed subject-matter can thus be acknowledged on the basis of each of these two differences.

5. It remains to be decided whether the claimed subject-matter involves an inventive step with regard to document (2).

The compositions as defined in the patent in suit are mainly suitable for jacketing and sheathing of cables (column 2, lines 20 to 22; column 5, lines 19 to 28). By contrast, the compositions according to the citation are used exclusively for manufacturing artificial leather sheet material. As correctly pointed out by the Respondent in its reply filed on 11 February 1988 and in the Counterstatement of Appeal, the prior art component (c) is in fact the kind of ethylene-vinyl acetate copolymer which is normally used in the formulation of hot melt adhesives. It ensures that the composition is sufficiently adhesive for bonding strongly to a fibre substrate, even without the presence of an adhesive layer, as specified in document (2) (page 9, paragraph 4). Such a composition would be expected to soften appreciably when heated to moderate temperatures, as encountered on energy or power cables, and thereby to be unsuitable for cable sheathing or insulation applications. This argument, from which it follows that compositions for leather-like material and compositions for cable sheathing or insulation must satisfy totally different criteria, has been left unanswered by the Appellant.

In the absence of any document or argument showing how a composition known to be suitable for leather-like material should be modified to make it suitable according to amendment (i) for the applications envisaged in the patent in suit, the differences noted above when dealing with the issue of novelty must be regarded as non-obvious. Nor is there any pointer in that direction in any of the other citations. It follows that the claimed subject-matter involves an inventive step.

6. Claim 1 being hence allowable, the same applies to dependent Claim 2, which is directed to a preferred composition according to Claim 1, as well as to Claims 3 to 7, which concern products obtained by using these compositions, and whose inventiveness is supported by that of the main claim.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar:



E. Gorgmaier

The Chairman:



F. Antony