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Bezeichnung der Erfindung: Cross-linked polyethylene insulated cables
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : H01B 3/44

ENTSCHEIDUNG / DECISION

vom / of / du 12 September 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet : SUMITOMO ELECTRIC INDUSTRIES LIMITED

Einsprechender / Opponent / Opposant : SIEMENS AG

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 54

Schlagwort / Keyword / Mot clé : "Novelty (denied)"
"Claim anticipated by comparative example in prior publication"

Leitsatz / Headnote / Sommaire

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Case Number : T 434/89 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 12 September 1990

Appellant : (Proprietor of the patent)
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Representative :

Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 10 May 1989 revoking European Patent No. 0 099 640 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : W.J.L. Wheeler
Members : A. Hagenbucher
M. Lewenton

Summary of Facts and Submissions

I. The grant of the Appellant's European patent No. 99 640 on European patent application No. 83 303 394.7, which was filed on 13 June 1983 claiming priority of 23 June 1982 from a previous application in Japan, was published on 3 September 1986. As granted, the patent had 4 claims, of which Claim 1 is worded as follows:
" A cross-linked polyethylene insulated cable which is prepared by extrusion coating a polyethylene composition on a conductor, the polyethylene composition comprising polyethylene, more than 10% to less than 30% by weight of an ethylene-vinyl acetate copolymer having a vinyl acetate (VA) content of more than 25% to less than 35% by weight, an organic peroxide and others, and thereafter cross-linking the thus coated polyethylene composition."
Claims 2 to 4 are dependent on Claim 1.

II. On 2 June 1987 the Respondent filed an opposition, requesting revocation of the patent on the grounds that its subject-matter did not involve an inventive step within the meaning of Article 56 EPC. The Respondent cited the following prior art documents:

JP-A-53-012 092 (which will be referred to as D1)
JP-A-52-150 458 (D2)
DE-A-2 507 289 (D3)
"Technische Mitteilungen", 1965, No. 5, page 227 (D4).

III. In a decision dispatched on 10 May 1989, the Opposition Division revoked the patent. The gist of the reasons for that decision was that the subject-matter of Claim 1 did not involve an inventive step, since the subject-matter of Claims 1 to 4 differed from the prior art according to D1 (interpreted on the basis of a very short abstract in German) only in that the cross-linking was done by an

organic peroxide instead of ionizing radiation, and it was known from D3 and D4 that blends of polyethylene (PE) and ethylene-vinyl acetate copolymer (EVA) could be cross-linked by an organic peroxide.

IV. On 6 July 1989 the Appellant filed a notice of appeal against that decision, and paid the appeal fee. A written statement setting out the grounds of appeal was filed on 11 September 1989, together with a conditional request for oral proceedings.

V. The Appellant argued in effect that at the time the present invention was made (1982) a person with ordinary skill in the art would have considered the teaching of D1 (1978) to be an advance over the earlier teaching of D4 (1965) and D3 (1975) and would therefore not have considered going back to peroxide cross-linking. The invention provided a surprising advantage, the breakdown time being more than doubled, as shown by Table 1 on page 4 of the patent.

VI. In a letter dated 2 November 1989, the Respondent argued that it was part of the skilled person's general knowledge, that copolymers suitable for use as insulation in electric cables could be cross-linked by peroxides or by ionizing radiation. The letter contained a conditional request for oral proceedings.

VII. In order to ascertain the teaching of D1, the Board obtained a translation of D1 into English and enclosed it with a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal, pointing out that it appeared from the translation that comparative example 1, described in D1, fell within the scope of Claims 1 to 4 of the opposed patent.

VIII. A letter dated 24 July 1990 was received from the Appellant's representative, saying that the Appellant would not be represented at the oral proceedings. In a further letter dated 8 August 1990, received 9 August 1990, the Appellant defended the opposed patent in writing and presented an auxiliary request in respect of an amended Claim 1.

IX. Claim 1 of the auxiliary request is worded as follows:

"A cross-linked polyethylene insulated cable which is prepared by extrusion coating a polyethylene composition on a conductor, the polyethylene composition comprising polyethylene, more than 10% to less than 30% by weight of an ethylene-vinyl acetate copolymer having a vinyl acetate (VA) content of more than 25% to less than 35% by weight, an organic peroxide and others, and thereafter chemically cross-linking the thus coated polyethylene composition by means of said organic peroxide."

X. The Appellant's further arguments were in effect that the compositions of the reference examples to be compared with embodiment example 1 were specified in the first seven lines on page 4 of the translation of D1, where EVA was not mentioned. On page 4, line 4, of the translation, the wording "In addition to the above-noted mixtures, compositions" should be corrected to "Besides the samples prepared above, composition". There was no indication that curve 1 in Fig. 1 of D1 related to the EVA/PE mixture of embodiment example 1 described at the bottom of page 3 of the translation, or that the coating was by extrusion in that example. Therefore Claims 1 to 4 did not lack novelty over D1. The auxiliary request was submitted to make it explicitly clear that the claims were limited to chemical cross-linking of the composition by means of the organic peroxide. The Appellant referred to the decisions in

cases T 247/84, T 256/84 and T 274/87 in support of the "could or would" argument already presented (see paragraph V above).

XI. The Appellant requested that the decision of the Opposition Division be set aside and that the patent be maintained unamended (main request), or in amended form, on the basis of the amended Claim 1 filed on 9 August 1990 (auxiliary request).

XII. Oral proceedings were held on 12 September 1990. Nobody appeared on behalf of the Appellant.

XIII. Contesting the Appellant's interpretation of D1, the Respondent pointed out that the central paragraph on page 3 of the translation said that the insulation material was covered on the wire by extrusion and added that this was the usual method. The four examples disclosed in the lower half of page 4 must correspond to the four wires described in the paragraph bridging pages 3 and 4, since Fig. 1 showed the results obtained from testing those wires. The first of those examples was obtained by chemical cross-linking of EVA/PE mixture, i.e. the EVA/PE mixture described at the bottom of page 3. Therefore the subject-matter of Claim 1 of the main and auxiliary requests was not novel over D1.

XIV. The Respondent requested dismissal of the appeal.

Reasons for the Decision

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

2. While the Board is prepared to accept the Appellant's correction of line 4 of page 4 of the translation of D1 (see paragraph X above), the Board nevertheless agrees with the Respondent's interpretation of that document.

2.1 The central paragraph on page 3 of the translation, to which the Respondent referred, is worded:

"This invention is intended to eliminate the above-noted deficiencies and proposes an insulated electric wire characterised in that a composition obtained by blending of ethylene-vinyl acetate copolymer with polyolefin materials is covered on a conductor by extrusion, and ionizing radiation is irradiated for cross-linking."

The Board notes that that paragraph is in agreement with the claim recited on page 2 of the translation, so that the D1 invention (and any embodiment thereof) is clearly limited to wires in which the coating has been done by extrusion.

2.2 Starting near the bottom of page 3 and continuing on page 4 of the translation is a paragraph headed "Embodiment example 1". After incorporation of the Appellant's correction, that paragraph is worded:

"A composition obtained by mixing of low-density polyethylene (Q= 0.92, MI = 1.0) and EVA with a VA content of 30% (MI = 30, Q = 0.96) at a ratio of 8:2 and by addition to this composition of 0.3 part by weight SWC (sanito white crystal) was covered on a 2.2 mm dia. copper conductor at 0.4 mm thickness, a 24 Mrad electron beam was irradiated, and the embodiment example was prepared. As a reference example, an electric wire obtained by the addition of 0.3 part by weight SWC to polyethylene and electron beam irradiation was simultaneously prepared.

Besides the samples prepared above, composition obtained by the addition of 0.5 [error] part by weight SWC and 2.5 parts by weight DCP (dicumyl peroxide) to polyethylene were also covered and then cross-linked by heating at 200°C x 3 min."

2.3 The Board shares the Respondent's view that, since embodiment example 1 is an embodiment of the D1 invention, it is unambiguously implicit that the covering was done by extrusion. Thus embodiment example 1 has all the features specified in Claim 1 of the opposed patent as granted, except for the organic peroxide. There is also a further implied difference (explicit in the Appellant's auxiliary request) that in the opposed patent cross-linking is done chemically by the organic peroxide whereas in D1's embodiment example 1 it was done by electron beam irradiation.

2.4 The Board agrees with the Appellant that the paragraph cited in 2.2 above does not mention that the reference examples contain EVA. However, the following paragraphs on page 4 of the translation of D1 explain that:

"Four electric wires with the same structure were thus prepared. ... The overvoltage in water was determined ... Fig. 1 shows the results obtained."

It follows from the words "were thus prepared" that the four wires were prepared in accordance with the preceding paragraph (recited in 2.2 above), and it follows from the words "with the same structure" that the covering was done by extrusion for all four of those wires. It is also clear that the four plots shown in Fig. 1 are for those four wires.

2.5 Fig. 1 of D1 is a Weibull plot of the initial breakdown value for four different specimens, numbered 1 to 4. The lower half of page 4 of the translation is worded:

"In Fig. 1:

1 ... that obtained by chemical cross-linking of EVA/PE mixture (containing SWC);
2 ... that obtained by irradiation cross-linking of EVA/PE mixture (containing SWC);
3 ... that obtained by chemical cross-linking of PE (containing SWC);
4 ... that obtained by irradiation cross-linking of PE (containing SWC).

In comparison with the other three electric wires, the electric wires of the embodiment example do not show a greater breakdown value, though Fig. 1 suggests they have extremely low scatter."

From this it is clear that plot 2 is for the embodiment example 1.

2.6 There is some inconsistency in D1 concerning plot 1: on the one hand, it must be for one of the other three wires mentioned in 2.4 above; on the other hand, it was obtained by chemical cross-linking of EVA/PE mixture.

2.7 In the opinion of the Board, the only reasonable way to resolve this inconsistency is to read the last sentence of the paragraph continuing on page 4 of the translation as if the reference to polyethylene were short for "polyethylene or EVA/polyethylene mixture" (grammatical ellipsis). With such an interpretation, each one of the compositions described in that paragraph tallies with a

respective one of the four plots in Fig. 1, as explained in the lower half of page 4 of the translation (and repeated on page 6 of the translation). The alternative interpretation suggested in the Appellant's letter dated 8 August 1990, namely that the further compositions are produced by adding 0.5 parts by weight SWC and 2.5 parts by weight DCP, respectively, appears to be inconsistent with the explanation of the plots in the lower half of page 4 of the translation.

2.8 In view of the above considerations, the Board agrees with the Respondent that a person skilled in the art would infer directly and unambiguously from D1 that plot 1 in Fig. 1 is for a wire covered by extrusion with insulation material obtained by chemically cross-linking by means of DCP (an organic peroxide) the EVA/PE mixture described at the bottom of page 3 of the translation, that being the only EVA/PE mixture described in connection with embodiment example 1 and its comparative examples. Such a wire falls within the scope of Claim 1 of the Appellant's main and auxiliary requests.

3. The fact that the anticipation is a comparative example and not an embodiment of the invention described in D1 is immaterial. It has been made available to the public by written description before the priority date of the opposed patent, and consequently forms part of the state of the art according to Article 54(2) EPC.

4. In the result, the Board agrees with the Respondent that the subject-matter of Claim 1 of the main and auxiliary requests is not new, so that ground (a) in Article 100 EPC prejudices maintenance of the patent in suit in either of the forms specified in the Appellant's requests.

5. The appeal must therefore be dismissed. There is no need to consider whether the auxiliary request complies with Article 123 EPC, or to consider the submissions in respect of inventive step.

Order

For these reasons, it is desided that:

The appeal is dismissed.

The Registrar

M. Kiehl

The Chairman

W.J.L. Wheeler