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Datasheet for the decision of 26 October 2011

Case Number: T 1776/08 - 3.5.02

Application Number: 00201096.5

Publication Number: 1043733

IPC: H01B 7/29, H01B 3/44, C08K 3/22, C08L 23/08

Language of the proceedings: EN

Title of invention:
Self-extinguishing cable with low-level production of fumes, and flame-retardant composition used therein

Proprietor of the patent:
Prysmian S.p.A.

Opponent:
Basell Poliolefine Italia s.r.l.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56
RPBA Art. 13(1)(3)

Keyword:
"Novelty (no) - main request, second auxiliary request"
"Inventive step (no) - first and third auxiliary requests"
"Admissibility of late-filed request (no) - fourth auxiliary request"

Decisions cited:
-

Catchword:
see point 6 of the reasons

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Case Number: T 1776/08 **-** 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 26 October 2011

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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 10 July 2008 rejecting the opposition filed against European patent No. 1043733 pursuant to Article 102(2) EPC 1973.

Composition of the Board:

Chairman: M. Ruggiu
Members: R. Lord
P. Mühlens

Summary of Facts and Submissions

I. This is an appeal of the opponent against the decision of the opposition division to reject the opposition against European patent No. 1 043 733.

II. The following documents which played a role in the appeal proceedings are relevant for this decision:

D1: U. Zucchelli, "PP based cable grades from new polypropylene technology", Communications Cabling, A.L. Harmer (Ed.), IOS Press 1997, pages 49 to 56;

D2: EP 0 893 801 A;

D3: M.A. Hallam and A. Llewellyn, "Flame retardant, halogen free, polypropylene in wire and cable", Proceedings of Plastronics '93, 29 and 30 June 1993, Frankfurt;

D6: US 7 125 924 B;

Annex IIIbis: ASTM, "Standard Test Method for Tensile Properties of Plastics", Designation D638-91.

III. Oral proceedings before the board took place on 26 October 2011.

The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), or that the patent be maintained in amended form on the basis of one of the first, second or third auxiliary requests filed with letter of 26 September 2011 and that a fourth

auxiliary request filed at the oral proceedings of 26 October 2011 be admitted into the proceedings.

IV. Claim 1 of the patent in suit as granted reads as follows:

"Cable comprising at least one conductor (1) and at least one flame-retardant coating layer (3) based on a polymer material and a flame-retardant inorganic filler, characterized in that the said polymer material comprises a heterophase copolymer having an elastomeric phase based on ethylene copolymerized with an α-olefin and a thermoplastic phase based on propylene, the said elastomeric phase in the said heterophase copolymer being at least 45% by weight relative to the total weight of the heterophase copolymer, the said heterophase copolymer being substantially devoid of crystallinity deriving from polyethylene sequences."

Claim 14 of the patent in suit as granted reads as follows:

"Flame-retardant composition based on a polymer material and a flame-retardant inorganic filler, characterized in that the said polymer material comprises a heterophase copolymer having an elastomeric phase based on ethylene copolymerized with an α-olefin and a thermoplastic phase based on propylene, the said elastomeric phase in the said heterophase copolymer being at least 45% by weight relative to the total weight of the heterophase copolymer, the said heterophase copolymer being substantially devoid of crystallinity deriving from polyethylene sequences."

Claims 1 and 11 of the respondent's first auxiliary request differ from claims 1 and 14 of the patent in suit as granted in that the phrase ", and the said flame-retardant inorganic filler is natural magnesium hydroxide" is added at the end of each claim.

Claims 1 and 13 of the respondent's second auxiliary request differ from claims 1 and 14 of the patent in suit as granted in that the phrase "the said heterophase copolymer being substantially devoid of crystallinity deriving from polyethylene sequences" is replaced by the phrase "the said heterophase copolymer has a heat of fusion of peaks present below 130°C and attributable to polyethylene sequences of less than 3 J/g". Additionally, in claim 1, the word "and" is inserted before this replacement phrase.

Claims 1 and 10 of the respondent's third auxiliary request differ from claims 1 and 13 of his second auxiliary request by the addition of the same phrase cited above with reference to the first auxiliary request, and in that the additional word "and" mentioned with respect to claim 1 of the second auxiliary request does not appear in this request.

V. The appellant essentially argued as follows:

Each of the documents D1 (in particular section 3, first two paragraphs) and D3 (in particular sections 3.0, 3.1, 4.1 and 4.2) disclosed a flame-retardant composition having all of the technical features defined in claim 14 of the patent in suit as granted except for the feature "***said heterophase copolymer being substantially devoid of crystallinity deriving***

from polyethylene sequences", and implicitly disclosed a cable comprising a conductor and this composition, as defined in claim 1 of the patent in suit as granted. The polymer Hifax CA10A which was used in the preferred examples of D1 and D3 was the polymer which was used in examples 1 and 4 of the patent in suit (designated "*Cop. 2*" there). Since the polymer used in D1 and D3 was the same material as that used in the patent in suit, it inherently had the properties of that material as disclosed in the patent in suit, in particular the absence of crystallinity deriving from polyethylene sequences. Therefore the subject-matter of claims 1 and 14 of the patent in suit as granted lacked novelty with respect to D1 or D3.

Neither the cited prior art nor the patent in suit provided any reason to conclude that Hifax CA10A did not designate a single polymer grade. In particular, the patent in suit contained no suggestion that a selection among purchased batches of this polymer was required in order to provide the desired properties, but suggested rather that the polymer was used as purchased. The concept that a selection was required in order to carry out the invention was introduced by the respondent only during the opposition procedure. Moreover, the results for polypropylene in Table 6 of Annex IIIbis (the measurement standard for tensile properties specified in D1 and D3), when interpreted in the light of the footnote to that table and the definitions in the standard of the parameters in the table, indicated that the differences between the results for elongation at break and tensile strength at break in D1 and D3 were not large enough to be considered to be anything more than measurement

variation. The teaching of D6 was also consistent with this conclusion, firstly because its general teaching (e.g. column 2, lines 7 to 25) was to provide further improvement over the composition of the patent in suit, and secondly because the results in that document showing lower elongation at break were for a composition having a higher filler loading than the examples of D1, D3 and the patent in suit.

Magnesium hydroxide was used as the filler also in the preferred example of D1 (see section 4). The selection of the natural form of that material, as defined in claims 1 and 11 of the respondent's first auxiliary request, was an arbitrary selection of a type of magnesium hydroxide, the use of which in such compositions was known to the skilled person. This was illustrated by document D2, which concerned a similar flame-retardant composition to those of D1 and D3 (as shown for example at page 4, lines 34 to 37). The text at page 7, lines 11 and 12 of D2 indicated that the same form of magnesium hydroxide was used as in the examples of the patent in suit (Hydrofy GS1.5, as indicated there and in the footnote to Table 2 of the patent in suit). Moreover, the patent in suit could not have provided any suggestion of an advantage arising from this selection, because all of the examples and comparative examples used the same filler. Thus the selection of this filler material was obvious, so that the subject-matter of claims 1 and 11 of the first auxiliary request did not involve an inventive step.

The heat of fusion as defined in claims 1 and 13 of the respondent's second auxiliary request was an inherent feature of the Hifax CA10A polymer for the same reasons

as given with respect to the crystallinity feature in the patent in suit as granted. Therefore the subject-matter of these claims also lacked novelty.

The arguments presented with respect to the respondent's first and second auxiliary requests applied correspondingly to the third auxiliary request. Therefore the subject-matter of claims 1 and 10 of that request also did not involve an inventive step.

The respondent's fourth auxiliary request was filed very late in the procedure, and resulted in the need to consider issues not previously discussed. The respondent had not given any reason why the request could not have been filed much earlier in the procedure Therefore it should not be admitted into the proceedings.

VI. The arguments of the respondent which are relevant for this decision can be summarised as follows:

The feature of claims 1 and 14 of the patent in suit as granted of "***said heterophase copolymer being substantially devoid of crystallinity deriving from polyethylene sequences***" was not implicit in D1 or D3, because the designation Hifax CA10A referred to a range of polymer grades, or at least to a polymer grade in which this crystallinity was not controlled. According to the invention, a selection amongst received batches of the material was necessary to ensure that it was substantially devoid of this form of crystallinity, and thus to enable the advantages of the invention to be achieved.

That the designation Hifax CA10A covered different materials was apparent from the different results for elongation at break shown in documents D1 and D3, and was also supported by the different results cited in those documents for tensile strength at break and elongation at break of the related material Hifax CA12A. A further indication of this was to be found in the document D6, since it explicitly referred to the elongation at break of Hifax CA10A being "***evidently deteriorated***" by the incorporation of filler (paragraph spanning columns 12 and 13, referring to the results in Table 1), and thus clearly related to a different material from those of D1 and D3.

Claims 1 and 11 of the first auxiliary request defined a combination invention, since it required both a selection of the specific type of polymer (i.e. as in the patent as granted), and the selection of the specific filler material. The advantages of this combination were demonstrated by the examples and comparative examples of the patent, and could also be seen with respect to the comparative examples of D6.

The heat of fusion specified in claims 1 and 13 of the second auxiliary request was not implicit in D1 or D3, because, as discussed with respect to the patent as granted, a selection amongst batches of the Hifax CA10A material was necessary to ensure that it had this feature.

Claims 1 and 10 of the third auxiliary request required both the selection involved in the second auxiliary request and a combination invention corresponding to

that discussed with respect to the first auxiliary request.

The fourth auxiliary request should be admitted into the proceedings, because it served to emphasise the link between the specific composition specified in the third auxiliary request and the nature of the cable as such.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 The document D1 discloses the use of the Hifax range of polymers for wires and cables (see e.g. the first paragraph of section 3 on page 50). In particular, it describes that a filler such as magnesium hydroxide can be added as a flame retardant, and that for such uses Hifax CA10A is one of the two most common grades. This document thus explicitly discloses a flame-retardant composition based on Hifax CA10A and an inorganic filler, and implicitly discloses a cable comprising at least one conductor and at least one flame-retardant coating layer of that composition.

2.2 The document D3 contains similar explicit and implicit disclosure (see in particular sections 3.1, 4.1 and 4.2 of that document). The material EXP 1657 is explicitly disclosed in section 4.1 as being a composition comprising Hifax CA10A and a hydrated (i.e. inorganic) flame-retardant filler.

2.3 Additionally, as described in D1 (section 3, first and second paragraphs) and D3 (sections 3.0 and 3.1), the polymer Hifax CA10A is a heterophase copolymer having an elastomeric phase (EP rubber) based on ethylene copolymerised with an α-olefin (propylene), and a thermoplastic phase based on polypropylene ("*PP matrix*" in D1, "*PP alloy*" in D3). Both documents indicate that the polymer contains "as much as 65%" of the elastomeric phase. The polymer Hifax CA10A described in these documents thus explicitly includes all of the technical features of the heterophase copolymer defined in claims 1 and 14 of the patent in suit with the exception of the feature that it is "*substantially devoid of crystallinity deriving from polyethylene sequences*".

2.4 Moreover, the patent in suit makes use of the material Hifax CA10A in two examples of the claimed invention (examples 1 and 4 of Table 2 of the patent). This is apparent from the fact that Table 2 shows that these two examples use the material designated "*Cop. 2*" as the heterophase copolymer, which according to the notes below Table 1 is the polymer Hifax CA10A. Paragraph [0050] indicates explicitly that this heterophase copolymer is used according to the invention. It can thus be assumed that the polymer Hifax CA10A has the property of being substantially devoid of crystallinity deriving from polyethylene sequences, since this is a feature of the claimed invention, so that the compositions and cables of D1 and D3 discussed above also implicitly include this feature.

2.5 According to the arguments of the respondent, and according to the decision under appeal, the conclusion of paragraph 2.4 above concerning implicit disclosure was not valid, because the designation Hifax CA10A refers to a range of polymers (either as different grades, or a single grade in which the degree of crystallinity was not controlled), from which a selection had to be made in order to ensure that the properties required for the invention were present. The board does not find these arguments convincing, for the following reasons.

2.5.1 The central point of the respondent's argument in this respect was that the inventors had recognised that in order to achieve the desired improvements of the claimed invention, it was necessary to ensure that the heterophase copolymer was substantially devoid of crystallinity deriving from polyethylene sequences, and that the intrinsic variability of the polymer Hifax CA10A was such that it was necessary to test the different batches of that material as purchased, and to select only those which had this required property. The respondent argued in particular that since no value for this property was cited for the product in D1 and D3, it would not have been controlled during manufacture, so could have been highly variable. However, the board considers it to be highly significant that the patent in suit, and the application as originally filed, contain no suggestion that such testing and selection is necessary. To the contrary, the wording of the description of the embodiments in the patent, from paragraph [0050] onwards, strongly suggests that for examples 1 and 4 the polymer Hifax CA10A is used as received from the supplier.

2.5.2 In the decision under appeal the opposition division concluded that the difference between the measured results for elongation at break in D1 and D3 (800% in Table 1 of D1, 850% in Table 1 of D3) was sufficiently large as to indicate that the materials tested in these two cases were actually different, thus providing support for the argument of the respondent (patent proprietor). However, both of these documents indicate in the cited tables that this parameter is measured according to the method of ASTM D638, i.e. the standard for which the 1991 edition is on file as Annex IIIbis. The footnote to Table 6 of that standard, which concerns the measurement of elongation at break, indicates that for polypropylene this measurement is highly variable. Moreover, the values of the standard deviations, repeatability and reproducibility in the last line of that table, taken together with the explanations of those parameters in paragraphs 13.3.1 to 13.3.4, indicate that the difference between the results cited in D1 and D3 are well within the scope of measurement variation, and in no way imply that the materials under test were different. The same conclusion applies with respect to the cited measurements for tensile strength at break, and to the results for the polymer Hifax CA12A ("*Cop. 3*" in the patent in suit). The board therefore concludes that the variation in these different measurement results does not suggest any variability in the actual properties of Hifax CA10A.

2.5.3 The respondent has also argued that the teaching in the document D6 relating to Hifax CA10A, which is used in comparative example 1 as shown in Table 1 of that

document, implies that the material used there is also different from that used in D1, D3 and the patent in suit, in particular given that the composition (i.e. polymer with filler and other additives) is shown there as having a significantly lower elongation at break (223%) than the corresponding examples of D3 and the patent in suit (700% for EXP1657/3 in Table 7 of D3, 622% for example 1 in Table 2 of the patent in suit). The board notes, however, that D6 has a priority date approximately three years after the patent in suit, and refers to the application on which the patent in suit is based in the introductory part of the description (see column 2, lines 7 to 25), so that it can be understood as describing a further development from the composition of the patent in suit. On this basis, the fact that the measured elongation at break in D6 is lower than in D3 and the patent in suit can be understood as being merely a consequence of the fact that in D6 it is desired to incorporate still higher levels of filler in the composition. Specifically, in D6 all of the examples and comparative examples include filler at a level of 67% by weight (except comparative examples 2 to 4 which have no filler), whereas the examples and comparative examples of the patent in suit have only approximately 61% by weight, and the disclosure of D1 and D3 relating to Hifax CA10A contemplates filler levels only up to 60% (see D1, section 4, last paragraph and D3, section 4.2, first paragraph). The board is therefore of the opinion that the lower elongation cited in D6 can be understood as being a result of the increased filler content, so that this document provides no suggestion that the Hifax CA10A material used there is in any way different from that used in D1, D3 or the patent in suit.

2.5.4 The board thus concludes that the patent in suit teaches that the polymer Hifax CA10A inherently has the property of being substantially devoid of crystallinity deriving from polyethylene sequences, so that the documents D1 and D3 implicitly disclose this feature.

2.6 Therefore, when taking into account both their explicit teaching and their implicit teaching, each of the documents D1 and D3 discloses both a composition according to claim 14 and a cable according to claim 1 of the patent in suit as granted. The subject-matter of those claims therefore lacks novelty.

3. *First auxiliary request*

3.1 Claims 1 and 11 of this request differ from claims 1 and 14 of the patent in suit as granted in that they define additionally that the flame-retardant inorganic filler is natural magnesium hydroxide. In this context, the document D1 discloses (see section 4) that flame retardancy can be achieved with halogenated additives or magnesium hydroxide, but the specific disclosure relating to the Hifax CA10A polymer in the last paragraph of that section specifies a halogen-free flame retardant, thus implying the use of magnesium hydroxide. Hence, given the above conclusion concerning the disclosure of D1 with respect to the respondent's main request, the cable and composition of claims 1 and 11 of this request differ from those of D1 only in that the magnesium hydroxide is specified as being "*natural*".

3.2 It is apparent from document D2 that natural magnesium hydroxide is a known flame-retardant filler in this

type of composition, since the material used as a flame retardant there (see page 7, lines 11 and 12) is exactly the same material as that used in all of the examples of the patent in suit (Hydrofy GS1.5, see footnote to Table 2 of the patent in suit). Given this identity, the fact that D2 does not explicitly state that the material is natural is of no relevance. That the teaching of D2 is relevant to D1 is clear from the fact that D2 also concerns a heterogeneous copolymer of polypropylene and an elastomeric copolymer of ethylene and an α-olefin, and has the aim of incorporating fillers, such as flame retardants, without an unacceptable degradation of their mechanical and elastic properties (see page 4, lines 34 to 37).

3.3 Thus, and in the light of the fact that the patent in suit provides no indication of any technical advantage arising from the selection of natural magnesium hydroxide, the board considers the distinguishing features of claims 1 and 11 of this request with respect to D1 as representing merely an arbitrary selection from among the known types of magnesium hydroxide filler. Such an arbitrary selection cannot be considered to involve an inventive step.

3.4 The respondent has argued that an inventive step arises from the combination of the selected type of copolymer with the use of the natural form of magnesium hydroxide. This argument cannot however succeed, because the specific type of copolymer to which the respondent refers is already present in the composition disclosed in D1, so that the only technical difference between the claimed subject-matter and the composition and cable of D1 lies in the form of the magnesium hydroxide.

Since all of the examples and counter-examples in the patent in suit use the same form of that material, they cannot provide any teaching regarding the consequences of that difference. The same applies to the comparative examples of D6 in which Hifax CA10A is used.

3.5 The board therefore concludes that the subject-matter of claims 1 and 11 of the respondent's first auxiliary request does not involve an inventive step.

4. *Second auxiliary request*

4.1 Claims 1 and 13 of this request differ from claims 1 and 14 of the patent in suit as granted in that the definition that the heterophase copolymer is "*substantially devoid of crystallinity deriving from polyethylene sequences*" is replaced by a definition that this copolymer has "*a heat of fusion of peaks present below 130°C and attributable to polyethylene sequences of less than 3J/g*". This added feature is not explicitly disclosed in either of documents D1 and D3. However, both Table 1 and Fig. 4 of the patent in suit demonstrate that this is a property of the Hifax CA10A polymer used, under the designation "*Cop. 2*", in examples 1 and 4 of the invention. Thus for reasons corresponding to those discussed above with respect to the main request, the board considers this feature to be implicitly disclosed in each of D1 and D3. Therefore, the board concludes that the subject-matter of claims 1 and 13 of the respondent's second auxiliary request lacks novelty.

4.2 The respondent's arguments concerning this request related to the same issues of implicit disclosure and

variation of properties of Hifax CA10A as discussed with respect to the main request (see paragraph 2.5 and sub-paragraphs above). As indicated there, the board does not find these arguments convincing.

5. *Third auxiliary request*

Claims 1 and 10 of this request combine the amendments introduced in the first and second auxiliary requests. Since, for the reasons indicated in paragraph 3.4 above, there is no combination effect arising from the selection of the polymer and the selection of natural magnesium hydroxide which could form the basis of an inventive step, and since, for the reasons given in paragraphs 4.1 and 4.2 above, the feature added in the second auxiliary request is implicitly disclosed in D1, the subject-matter of these claims does not involve an inventive step for the same reasons as given above with respect to the first auxiliary request.

6. *Fourth auxiliary request*

6.1 Claim 1 according to this request is a combination of claim 1 according to the third auxiliary request with dependent claim 3 of that request (defining that the flame-retardant coating is placed directly on the conductor). The request was filed by the respondent during the oral proceedings before the board only after the completion of the discussion relating to the main request and the first to third auxiliary requests.

6.2 The respondent presented arguments as to why he had filed this request, i.e. in order to emphasise the link between the material aspects discussed with respect to

the previous requests and the cable itself. However, he presented no reasons why the request was presented only at this very late stage in the procedure.

6.3 The board notes that the amendment in this request raises issues not yet discussed during the appeal procedure, in that it would concern not just the nature of the coating composition, but also the structure of the cable, and also that the respondent has presented no reasons why the request could not have been filed earlier in the procedure. In the light of these facts, and exercising its discretion under Article 13(1) and (3) of the Rules of Procedure of the Boards of Appeal, the board decided not to admit this request into the proceedings.

7. In summary, claims 1 and 14 of the main request and claims 1 and 13 of the second auxiliary request define subject-matter which lacks novelty within the meaning of Article 54 EPC, and claims 1 and 11 of the first auxiliary request and claims 1 and 10 of the third auxiliary request define subject-matter which does not involve an inventive step according to Article 56 EPC. The opposition ground under Article 100(a) EPC thus prejudices the maintenance of the patent in suit as granted or as amended according to any of those auxiliary requests which have been admitted into the proceedings.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

C. Moser M. Ruggiu