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D E C I S I O N
of 4 September 2000

Case Number: T 0815/97 - 3.3.3

Application Number: 90309759.0

Publication Number: 0421610

IPC: C08F 220/22

Language of the proceedings: EN

Title of invention:
Improved flame retardant compositions

Applicant:
Bromine Compounds Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84, 114(1), (2), 123(2)

Keyword:
"Amendments - added subject-matter - main and first to third
auxiliary requests (yes) - fourth auxiliary request (no)"
"Decision re appeals - remittal (yes)"

Decisions cited:
G 0001/93; G 0010/93; T 0153/85; T 0337/95

Catchword:
-



Case Number: T 0815/97 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 4 September 2000

Appellant:

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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office issued on 4 March 1997
refusing European patent application
No. 90 309 759.0 pursuant to Article 97(1) EPC.

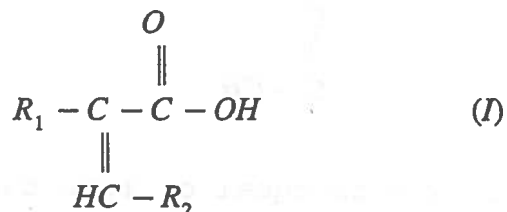
Composition of the Board:

Chairman: C. Gérardin
Members: R. Young
V. Di Cerbo

Summary of Facts and Submissions

I. European patent application No. 90 309 759.0, filed on 6 September 1990, claiming IL priorities of 28 September 1989 (IL 91820) and 14 August 1990 (IL 95382) and published under No. 0 421 610, was refused by a decision of the Examining Division issued on 4 March 1997. The decision was based on a set of claims made up of Claims 1 and 2 (page 19), 14 and 15, filed with letter of 12 June 1996 and Claims 2 (page 20) to 13, filed with letter of 6 November 1996, the claims reading as follows:

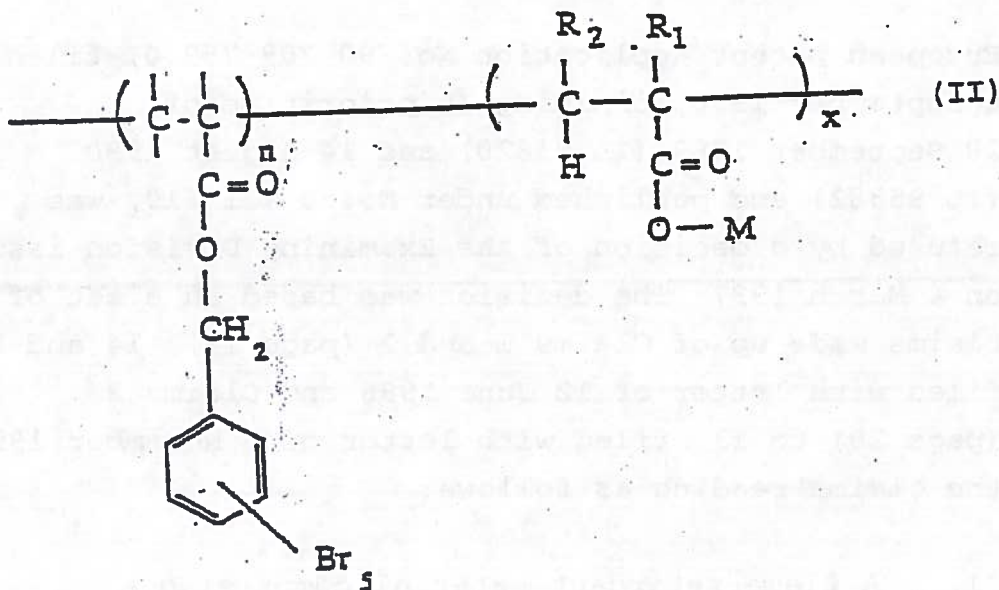
"1. A flame-retardant material comprising a copolymer of pentabromobenzyl-acrylate with a metal salt of a compound of Formula I:



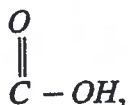
and wherein R₁ is H or CH₃, and R₂ is selected from H, CH₃ and



2. A copolymer comprising the repetitive units of the formula:



wherein M is a metal ion, R₁ is H or lower alkyl, R₂ is H, lower alkyl or



and the ratio x/n is equal or less than 1.

3. A flame-retardant material as claimed in claim 1 or 2, wherein the metal is selected from magnesium (Mg), zinc (Zn), sodium (Na), and potassium (K).

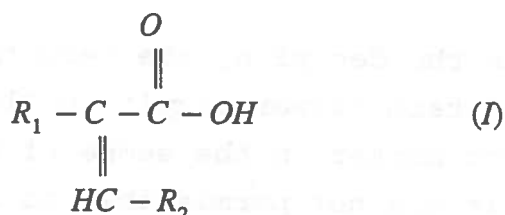
4. A flame-retardant material as claimed in claim 3, wherein the salt is selected from sodium acrylate, magnesium acrylate, zinc acrylate, potassium acrylate, bis-sodium-maleate, and their mixtures.

5. A method for imparting thermal stability to a poly-pentabromobenzyl acrylate (PBB-PA) based polymer, comprising copolymerizing (PBB-MA) with a compound of Formula I, as defined in claim 1.

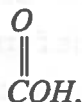
6. A method according to claim 5, wherein the compound of Formula I is added in an amount of up to 9 wt. %.

7. A method according to claim 6, wherein the compound of Formula I is added in an amount of 1.5 to 5 wt. %.

8. A flame-retarded plastics composition comprising a polymeric matrix and a copolymer of pentabromobenzyl-acrylate with a metal salt of a compound of Formula I:



and wherein R₁ is H or lower alkyl, and R₂ is selected from H, lower alkyl and



9. A flame-retarded composition according to claim 8, wherein the polymeric matrix is selected from engineering plastics and styrenic materials.

10. A flame-retarded composition according to claim 9, wherein the polymeric matrix is selected from high impact polystyrene (HIPS), acrylonitrile-butadiene-styrene terpolymer (ABS), polyethylene terephthalate (PET), polybutylene terephthalate (PBT), polyamides and blends thereof.

11. A flame-retarded composition according to any one of claims 8 to 10, wherein the polymeric matrix is reinforced.

12. A composition according to claim 11, wherein the polymeric matrix is glass fiber reinforced.

13. Flame-retarded synthetic articles containing a flame-retardant material as claimed in any one of claims 1 to 4.

14. A copolymer comprising pentabromyl acrylate units and units derived from a metal salt of an acrylic acid monomer that is copolymerizable therewith, and optionally units derived from at least one further copolymerizable monomer.

15. A copolymer according to claim 14 further comprising units derived from the acrylic acid monomer itself."

II. According to the decision, the term "methyl" replacing the original term "lower alkyl" in Claim 1 comprised added subject-matter in the sense of Article 123(2) EPC, since it was not permissible to replace a generic group by a specific group which had not originally been disclosed. Moreover, the term "lower alkyl" which had been retained in Claims 2 and 8 lacked clarity in the sense of Article 84 EPC, since there was no generally recognised definition of this term in respect of the number of carbon atoms which this group might contain.

III. On 13 May 1997, a Notice of Appeal against the above decision was filed, the prescribed fee being paid on the same day.

The Statement of Grounds of Appeal, filed on 7 July 1997, was accompanied by two new sets of Claims 1 to 15, forming a main and an auxiliary request respectively. The relevant definition of the original term "lower alkyl" had been amended to read "methyl, ethyl or propyl" in Claims 1, 2 and 8 of the main request, and "methyl" in the corresponding claims of the auxiliary request. The Appellant argued in substance as follows:

- (a) Whilst the term "lower alkyl" might be indefinite in respect of its upper limit, it was inconceivable that any other interpretation than "one" could be placed on the lower limit. Hence the amendment to "methyl" did not add subject-matter.
- (b) According to a statement in a decision of the Enlarged Board of Appeal G 1/93 (OJ EPO 1994, 541), if an added feature merely excluded protection for part of the subject-matter of the claimed invention, there could be no unwarranted advantage to the applicant in the adding of such a feature. Such an argument would apply with even greater relevance, in that whatever interpretation were applied to "lower alkyl" it would have to encompass at least "methyl", probably "methyl and ethyl" and possibly even "methyl, ethyl and propyl". Thus, the skilled person would necessarily understand that methyl, ethyl and propyl were intended.
- (c) Finally the precise meaning given to "lower alkyl" was not of substantial importance as regards the invention itself and in particular the patentability of the claimed invention. Hence, the amendments sought did not in essence supply the person skilled in the art with any new technical information.

IV. The Board expressed the preliminary, provisional view, in a communication issued on 14 June 2000, that neither the main nor the auxiliary request was allowable.

V. Oral proceedings were held before the Board on 4 September 2000. At the oral proceedings, the Appellant presented five further sets of Claims 1 to 15 forming a main request and a first, second, third and fourth auxiliary request respectively, to replace the requests accompanying the Statement of Grounds of Appeal, and furthermore referred, for the first time, to the document:

D2: International Union of Pure and Applied Chemistry, "Nomenclature of Organic Chemistry", prepared for publication by J. Rigaudy and S. P. Klesney, Pergamon Press, 1979, page 5.

The main request differed from the main request accompanying the Statement of Grounds of Appeal in that the phrase "methyl, ethyl or propyl" in Claims 1, 2 and 8 had been replaced by "methyl, ethyl, propyl or butyl" at each occurrence.

The first auxiliary request corresponded to the main request accompanying the Statement of Grounds of Appeal.

The second auxiliary request corresponded to the auxiliary request accompanying the Statement of Grounds of Appeal.

The third auxiliary request differed in that the term "lower alkyl" used in the application as originally filed had been replaced by "alkyl" in Claims 1, 2 and 8.

The fourth auxiliary request differed from the third auxiliary request in that the term "alkyl" had been deleted.

- VI. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, alternatively on the basis of any of the four auxiliary requests, all submitted during oral proceedings, or in the alternative, that the case be remitted to the first instance for further prosecution on the basis of the fourth auxiliary request.

Reasons for the Decision

1. The appeal is admissible.
2. *Late-filed requests*

Although all the requests under consideration are formally to be regarded as late-filed, to the extent that they were not submitted until the day of the oral proceedings, the Board saw no obstacle to considering on their merits the first three requests i.e. the main request and first and second auxiliary requests, for the following reason.

The main request differs from the main request already filed with the Statement of Grounds of Appeal only in the addition of a single further alkyl group (butyl) over and above the alternatives defined in the previous main request, and the first and second auxiliary requests correspond to the main and auxiliary requests, respectively, filed together with the Statement of Grounds of Appeal. Thus the relationship of the substance of the main request to that of the requests previously on file is immediately evident, and the issues arising in connection with it are analogous to those arising in relation to the main and auxiliary requests previously on file.

The claims of the third auxiliary request present a different picture, however, since the relevant amendment, i.e. the replacement of the original term "lower alkyl" by "alkyl" is not only not analogous to the amendments of the first three requests, but does not correspond to any request made during the proceedings before the Examining Division or up to now in the appeal proceedings. Such an amendment raises issues not previously considered in the appeal. According to the case law of the Boards of Appeal, such a late-filed request may be disregarded by the Board unless it is clearly allowable (T 153/85, OJ EPO 1988, 001).

Similar considerations apply to the fourth auxiliary request.

3. *Late-filed document*

The document presented by the Appellant for the first time at the oral proceedings (D2), although late-filed, consisted only of a single page, the contents of which were immediately evident to the Board. Consequently the Board saw no reason to exclude it from consideration in accordance with Article 114(2) EPC. Consequently, it was introduced into the proceedings in accordance with Article 114(1) EPC.

4. *Admissibility of amendments*

4.1 *Main request*

There is no explicit basis, in the documents of the application as originally filed for the reference, in Claims 1, 2 and 8 to any of the groups "methyl", "ethyl", "propyl", or "butyl", in the definition of the groups R_1 and/or R_2 , since none of these groups was

specifically referred to. Nor is there an implicit basis in the phrase "lower alkyl" appearing in the definitions of R_1 and R_2 as originally filed, since it is not permissible to replace a generic group by a specific group which has not originally been disclosed.

4.1.1 The argument of the Appellant at the oral proceedings, which relied upon the systematic naming of acyclic hydrocarbons in D2, is not convincing to the Board, for the following reasons.

4.1.1.1 According to D2, the first four saturated unbranched acyclic hydrocarbons are called "methane, ethane, propane and butane", whilst names of the "higher members of this series" consist of a numerical term, followed by "-ane" with elision of terminal "a" from the numerical term. The generic name of saturated acyclic hydrocarbons (branched or unbranched) is "alkane" (page 5, paragraph 1.1). Furthermore, univalent radicals derived from saturated unbranched acyclic hydrocarbons by removal of hydrogen from a terminal carbon atom are named by replacing the ending "-ane" of the name of the hydrocarbon by "-yl". As a class these radicals are called normal, or unbranched chain alkyls (page 5, paragraph 1.2).

4.1.1.2 It is thus evident that, although D2 refers to "higher members of this series", there is no reference to "higher alkyl" groups let alone to "lower alkyl" groups.

4.1.1.3 Even if the relevant term had not been absent from the document, it is evident that the cited passage, insofar as it refers to alkyl groups, defines them as being unbranched. This is, however, in contrast to the interpretation of the term "lower alkyl" in the application in suit as presented by the Appellant at

oral proceedings, which was intended to include all branched isomers. Consequently, the terms of the definition in D2 are not fully applicable to the species defined in the application in suit, being narrower in scope than the latter.

4.1.1.4 Finally, and notwithstanding the above, the significance of whether a trivial name or a systematic name is used according to an international standard has, in the Board's view, no relevance to the meaning to be applied to the term "lower alkyl" in the context of the subject-matter application in suit.

4.1.1.5 Consequently the disclosure of D2 does not provide the necessary support.

4.1.2 The further argument of the Appellant, on the basis of the decision T 337/95 (OJ EPO 1996, 628), that whereas the upper limit of the number of carbon atoms encompassed by the original term "lower alkyl" was indeterminate, nevertheless the lower limit was inescapably one, is not convincing to the Board, since the latter term refers only to a range or area and there was no emphasis in the application as originally filed on a lower or an upper limit. Consequently, it is not directly and unambiguously derivable that the lower limit intended was the lowest possible value that the term could cover. In other words, "methyl" is not directly and unambiguously derivable from the term "lower alkyl" in the present context.

4.1.3 The argument that the amendment should be allowed on the basis of the Enlarged Board of Appeal decision G 1/93 (supra), is not convincing either, since the permissibility of an added feature which excluded protection for part of the subject-matter of the claimed invention was only recognised, according to this decision, under the condition that the added

feature was not technically significant. In the present case, however, the insertion of references to specific groups such as "methyl" cannot be regarded as technically insignificant. On the contrary, the mention for the first time of a specific alkyl group represents, in the context of the formula given in Claim 1, the concrete disclosure of a new chemical substance. Thus the exception provided according to G 1/93 does not apply to the present amendment.

4.1.4 Finally, the argument that the amendment of the term "lower alkyl" is not significant for the patentability of the claimed subject-matter is irrelevant, since the question of whether an amendment is allowable in the sense of Article 123(2) EPC has to be considered separately from the question of whether the subject-matter before and after amendment is patentable.

4.1.5 In summary, the main request is not allowable under Article 123(2) EPC.

4.2 First auxiliary request

The claims of this request, which correspond to those of the main request filed with the Statement of Grounds of Appeal, differ from those of the present main request only in that "methyl, ethyl or propyl" groups are referred to instead of "methyl, ethyl, propyl or butyl" groups. This request is consequently not allowable for reasons analogous to those given in relation to the present main request.

4.3 Second auxiliary request

The claims of this request, which correspond to those of the auxiliary request filed with the Statement of Grounds of Appeal, differ from those of the present main request only in that, instead of referring to

"methyl, ethyl, propyl or butyl" groups, they refer only to a "methyl" group. Consequently this request is not allowable for reasons analogous to those given in relation to the present main request, in particular under section 4.1.2, above.

4.4 Third auxiliary request

The claims of this request, which are to be regarded as late-filed (section 2, above), differ from those of the main request in that the term "methyl, ethyl, propyl or butyl" in Claims 1, 2 and 8 has been replaced by "alkyl". This corresponds to a deletion of the word "lower" from the term "lower alkyl" used in the same context in the application as originally filed.

Whilst the term "lower alkyl" may not be precise as to the upper limit of the number of carbon atoms which it contains, it evidently refers to a region or area of alkyl groups which are not "higher" alkyl groups i.e. alkyl groups containing a very large number, say a two- or three- figure number, of carbon atoms. Consequently, the deletion of the restriction "lower" evidently results in the subject-matter of the claim being extended to refer to alkyl groups which originally were not made available to the skilled reader by the term "lower alkyl" groups.

- 4.4.1 The argument of the Appellant, at the oral proceedings, that the skilled person would know what this "alkyl" group was and would understand the term in a more limited way according to its necessary function in the context of a flame retardant species, was not supported by so much as a scrap of evidence. On the contrary, the complete absence, from the documents of the application as filed, of any example of what might be meant by such an "alkyl" group, apart

from the term "lower alkyl" previously objected to by the Examining Division, is, in the Board's view, an indication of the very lack of certainty surrounding the meaning of this term. Whatever selection of alkyl groups might have been understood by the skilled person as falling under the original term "lower alkyl", however, it is evident that a different population of such groups would be understood by the term "alkyl" without the qualification "lower".

4.4.2 Consequently, the amendment makes available alkyl groups which were not previously disclosed in the application as originally filed. Hence the amendment is not allowable under Article 123(2) EPC. The auxiliary request is thus not allowable, let alone clearly allowable within the meaning of the decision T 153/85 (cf. supra), and must be refused.

4.5 Fourth auxiliary request

The claims of this request differ from those of the present main request in that all reference to the offending methyl, ethyl, propyl or butyl groups has been deleted. The Board sees no objection to this amendment. On the contrary, it renders the request "clearly allowable" to the extent that it removes the ground for refusal of the application according to the decision under appeal.

5. There are, however, a number of points, unconnected with the ground for refusal, which arise in the claims of the present request and result in the Board refraining from directly issuing an order to grant a patent. These are as follows:

5.1 The phrase "units derived from a metal salt of an acrylic acid monomer" in Claim 14 is regarded as being extremely broad, both as to the expression "derived from" which apparently places no limitation upon the remoteness, from the origin of the derivation of the nature of the monomer, and as regards the term "acrylic acid monomer", which is indeterminate in scope.

In this connection, according to document D1: DE-A-2 527 802, previously cited in a communication of the Examining Division issued on 2 December 1993 (paragraph 1) there is disclosed *inter alia* a polymer of a pentabromobenzyl ester of acrylic acid (Claim 1). The pentabromobenzyl ester of acrylic acid is prepared by a reaction of an alkali metal salt of acrylic acid or methacrylic acid with the relevant brominated benzyl chloride, reference being made specifically in this connection to DE-A-2 508 468 (page 1, final paragraph). The latter document corresponds, however, to D4: FR-A-2 276 287, cited in the European Search Report, according to which the latter reaction is illustrated in detail in relation to sodium acrylate and pentabromobenzyl chloride (pages 1 and 2). Thus, the pentabromyl acrylate units referred to in Claim 14 of the application in suit may themselves be regarded as units derived from a metal salt of an acrylic acid monomer.

To this extent, the subject-matter of Claim 14 is not clearly distinguished from the disclosure of D1 read in the light of D4.

5.2 Claim 15 is open to objection in respect of the term "acrylic monomer" for reasons analogous to those given (section 5.1, above). Attention is furthermore directed to the reference, in D1, to the use of comonomers such as acrylic acid esters and methacrylic

acid esters, fumaric and maleic acid ester, and, in particular maleic anhydride, all of which would appear to fall within the scope of the term "acrylic acid monomer" (page 2, lines 42 to 45).

To this extent the subject-matter of Claim 15 is not clearly distinguished from the disclosure of D1 read in the light of D4.

- 5.3 Claim 1 is obscure in that, whilst being directed to "A flame-retardant material" it defines the latter as comprising only a single component, i.e. the defined copolymer. Although this obscurity does not arise in Claim 2, which is directed to a copolymer *per se*, the former obscurity is compounded in Claim 3, which refers to "A flame-retardant material" as claimed in Claim 1 or 2. Objection thus arises under Article 84 EPC with respect to Claims 1 and 3.

The above issues are introduced into the proceedings in accordance with the decision of the Enlarged Board G 10/93 (OJ EPO 1995, 172).


6. In view of the above, the Board has decided to make use of its discretionary powers under Article 111(1) EPC, in accordance with the request of the Appellant, to refer the case back to the first instance for further prosecution.

Order

For these reasons it is decided that:

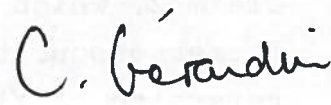
1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the fourth auxiliary request submitted at the oral proceedings.

The Registrar:



E. Görgmaier

The Chairman:



C. Gérardin