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D E C I S I O N
of 26 May 1999

Case Number: T 0477/97 - 3.3.3

Application Number: 90116512.6

Publication Number: 0415371

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Language of the proceedings: EN

Title of invention:
Self-extinguishing polymeric compositions

Applicant:
Ministero Dell' Universita' E Della Ricerca Scientifica E
Tecnologica

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - prior disclosure - implicit features (no)"

Decisions cited:
T 0234/93

Catchword:
-



Case Number: T 0477/97 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 26 May 1999

Appellant:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 12 December 1996
refusing European patent application
No. 90 116 512.6 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. Gérardin
Members: P. Kitzmantel
A. Lindqvist

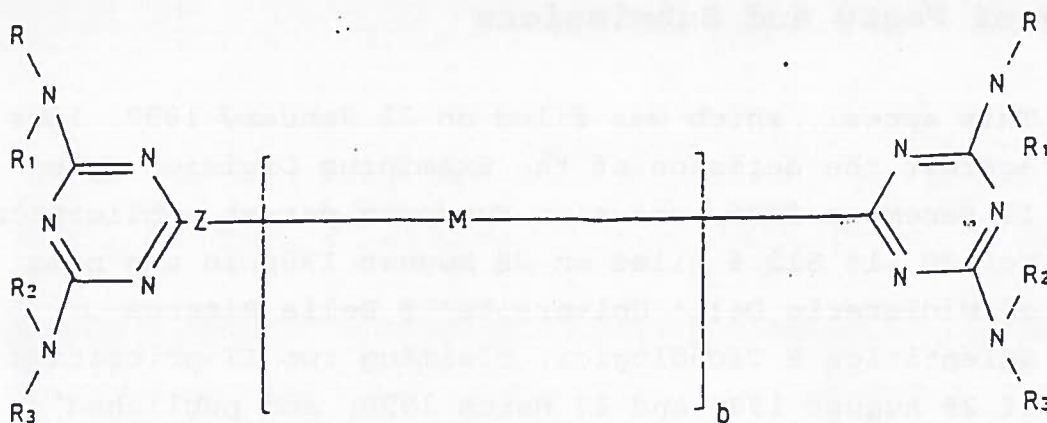
Summary of Facts and Submissions

I. This appeal, which was filed on 22 January 1997, lies against the decision of the Examining Division dated 12 December 1996, refusing European patent application No. 90 116 512.6 filed on 28 August 1990 in the name of Ministero Dell' Universita' E Della Ricerca Scientifica E Tecnologica, claiming two IT priorities of 28 August 1989 and 27 March 1990, and published under No. 0 415 371. The appeal fee was paid together with the Notice of Appeal and the Statement of Grounds of Appeal was filed on 15 April 1997.

II. The decision under appeal was based on a set of nine claims submitted with letter of 19 April 1995, independent Claims 1 and 9 reading as follows:

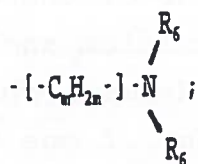
"1. Polymeric self-extinguishing compositions comprising:

- (a) from 89 to 45 parts by weight of thermoplastic polymer and/or of polymer endowed with elastomeric properties;
- (b) from 8 to 30 parts by weight of one or more compounds selected from ammonium and amine phosphates and ammonium and amine phosphonates;
- (c) from 3 to 25 parts by weight of one or more 2,4,6-triamino-1,3,5-triazine derivatives of general formula (I):



(I)

wherein the radicals R, R₁, R₂ and R₃, equal to or different from one another and having the same or different meanings in each triazine ring, are selected from H; (C₁-C₁₈)-alkyl; (C₂-C₈)-alkenyl; (C₆-C₁₆)-cycloalkyl and (C₆-C₁₆)-alkylcycloalkyl, optionally substituted with one or more hydroxy and/or (C₁-C₄)-hydroxyalkyl groups; -[C_nH_{2n}]-O-R₅; and



wherein:

n = an integer of from 2 to 8;

m = an integer of from 2 to 6;

R₅ = (C₁-C₈)-alkyl; (C₂-C₆)-alkenyl; -[C_pH_{2p}]-O-R₇,

wherein p is an integer of from 1 to 4 and R₇ is H or a (C₁-C₄)-alkyl group; (C₆-C₁₂)-cycloalkyl; or (C₆-C₁₂)-alkylcycloalkyl;

the radicals R₆, equal to or different from one another, are selected from

H; (C₁-C₈)-alkyl; (C₂-C₆)-alkenyl; (C₆-C₁₂)-cycloalkyl or (C₆-C₁₂)-alkylcycloalkyl; and (C₁-C₄)-hydroxyalkyl;

or the moiety $N(R_6)_2$
 is replaced by an N-heterocyclic radical
 selected from aziridinyl, pyrrolidinyl, piperidinyl,
 morpholinyl, thiomorpholinyl, piperazinyl, 4-
 methylpiperazinyl, and 4-ethylpiperazinyl, which is
 linked to the alkyl chain through the nitrogen atom;
 or in general formula (I) at least one of the moieties



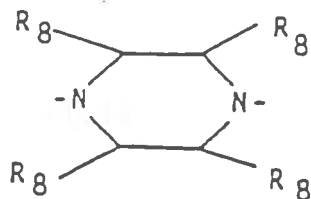
is replaced by an N-heterocyclic radical
 selected from aziridinyl, pyrrolidinyl, piperidinyl,
 morpholinyl, thiomorpholinyl, piperazinyl, 4-
 methylpiperazinyl, and 4-ethylpiperazinyl, 2-
 methylpiperazinyl, 2,5-dimethylpiperazinyl, 2,3,5,6-
 tetramethylpiperazinyl, 2,2,5,5-
 tetramethylpiperazinyl, 2-ethylpiperazinyl and 2,5-
 diethylpiperazinyl, which is linked to the triazine
 ring through the nitrogen atom;

a is 0 or 1;

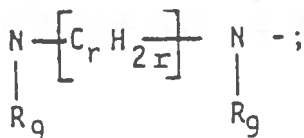
b is 0 or 1;

when b is zero:

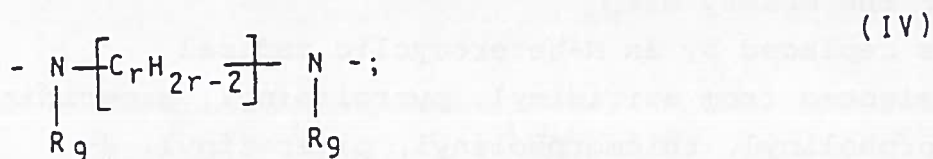
Z is selected from radicals of the following formulae:



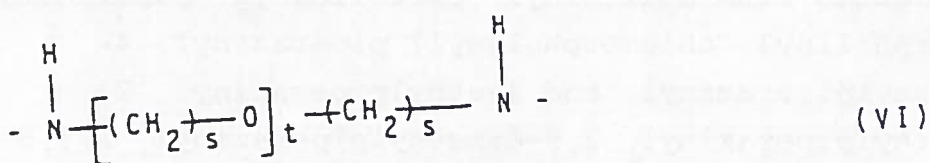
where the groups R_8 , the same or different from one
 another, represent hydrogen or (C_1-C_4) -alkyl;



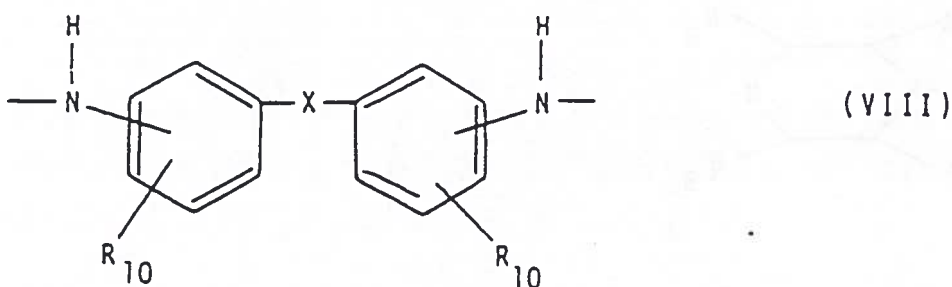
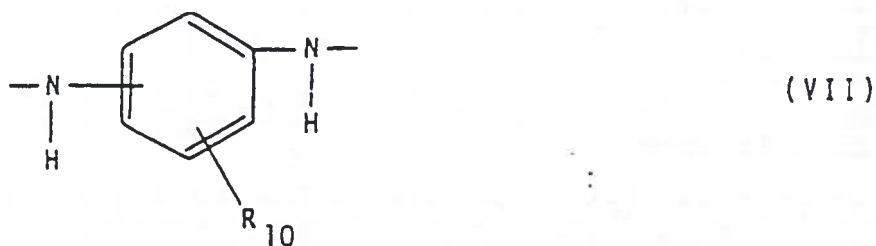
(III)



where r is an integer of from 2 to 14 and R₉ is hydrogen; (C₁-C₄)-alkyl; (C₂-C₆)-alkenyl; or (C₁-C₄)-hydroxyalkyl;



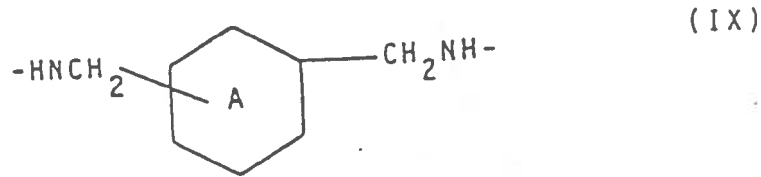
where s is an integer of from 2 to 5 and t is an integer of from 1 to 3;



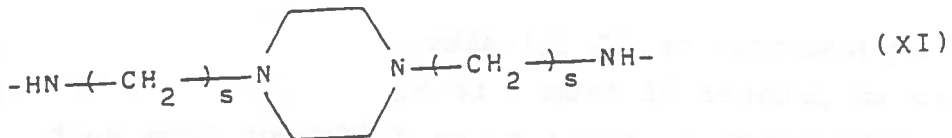
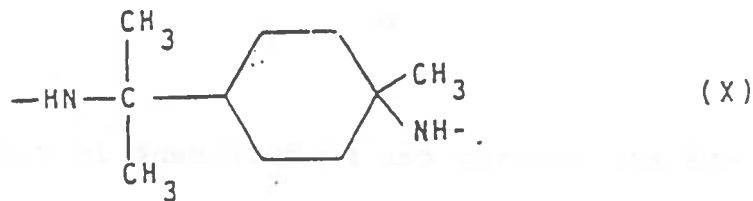
where:

X represents a direct bond; O; S; S-S; SO; SO₂; NH; NHSO₂; NHCO; N=N; and CH₂;

R₁₀ is hydrogen; hydroxy; (C₁-C₄)-alkyl; or (C₁-C₄)-alkoxy;



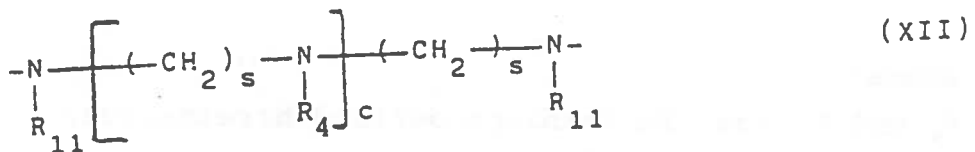
where A is a saturated or unsaturated ring;



where s has the meaning defined hereinabove;

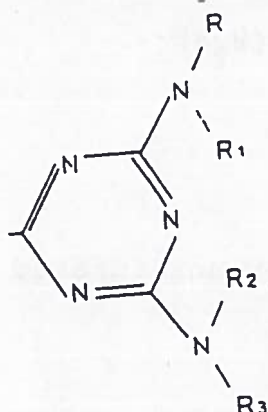
when b is 1:

-Z-M- is a radical represented by one of the following formulae:



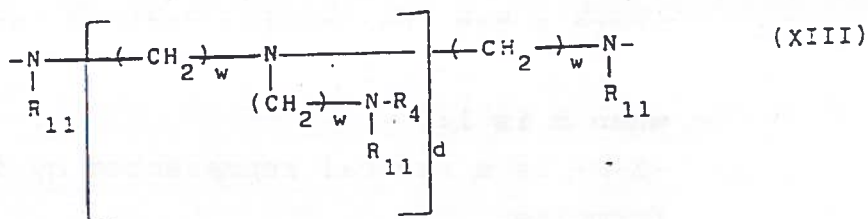
where:

R₄ is hydrogen or a group of the general formula



and its meaning can be different in each repeating unit;

R₁₁ is hydrogen or (C₁-C₄)-alkyl;
 c is an integer of from 1 to 5;
 the subscripts s, equal to or different from each other, have the meaning defined hereinabove; and



where:

R₄ and R₁₁ has the meanings defined hereinabove;
 w is an integer of from 2 to 4; and
 d is either 1 or 2."

"9. Moulded articles obtained from the compositions according to any of the preceding claims."

Claims 2 to 8 were dependent on Claim 1.

III. The decision under appeal held that the subject-matter of the application in suit was not novel over document

D1: EP-A-0 115 871,

because that disclosure encompassed self-extinguishing moulding compositions comprising a thermoplastic polymer, ammonium or amine phosphates and dimers of 2,4,6-triamino-1,3,5-triazine derivatives comprising terminal groups $-R_2H$ (cf. point 3.2 below). This nature of the terminal groups resulted from the fact that the skilled person, for the purpose of synthesizing dimers, would necessarily have reacted 2 moles of 2,6-dichlorotriazine with 3 moles of a diamine $H-R_2-H$.

As far as the application in suit comprised novel subject-matter, this was devoid of inventivity, because any variation of the substituents of the triazine derivatives was obvious and did not give rise to an unexpected technical effect.

IV. In his Statement of Grounds of Appeal the Appellant contended that the claimed subject-matter was novel over D1, because this document (i) did not allow to unambiguously identify the terminal groups of the 1,3,5-triazine oligomers, and (ii) stated clearly that the molar ratio of the reaction between the triazine derivative and the amine/piperazine was equal to 1:1 and not $n:(n+1)$ as alleged by the Examining Division.

Furthermore, even in the event that a molar ratio of 2:3 was within the disclosure of D1, the resulting oligomers would not meet the definition of formula (I) of the application in suit, because in that case the degree of polymerization would exceed the value of $n = 2$.

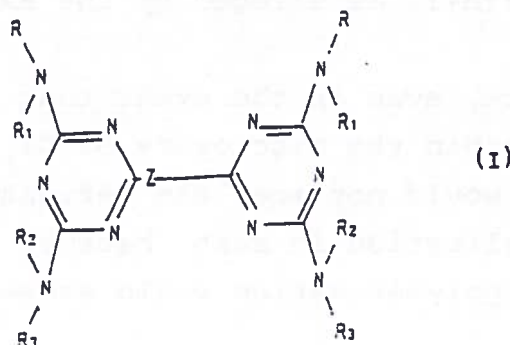
Moreover, the Appellant argued, the unpredictable superiority of the oxygen indices disclosed in Table 2 of the application in suit over those set out in the table on page 14 of D1 showed that the subject-matter of the application in suit was not only novel but did also involve an inventive step.

V. With his submission dated 6 April 1999 the Appellant filed an amended set of nine claims as well as revised pages 3 to 15 and 42 to 46 of the description.

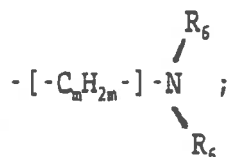
Claim 1 of this set as further amended by the Board in accordance with a telephone conversation with the Appellant on 16 April 1999 reads as follows:

"1. Polymeric self-extinguishing compositions comprising:

- (a) from 89 to 45 parts by weight of thermoplastic polymer and/or of polymer endowed with elastomeric properties;
- (b) from 8 to 30 parts by weight of one or more compounds selected from ammonium and amine phosphates and ammonium and amine phosphonates;
- (c) from 3 to 25 parts by weight of one or more 2,4,6-triamino-1,3,5-triazine derivatives of one of the formulae (I), (XII) or (XIII)



wherein the radicals R, R₁, R₂ and R₃, equal to or different from one another and having the same or different meanings in each triazine ring, are selected from H; (C₁-C₁₈)-alkyl; (C₂-C₈)-alkenyl; (C₆-C₁₆)-cycloalkyl and (C₆-C₁₆)-alkylcycloalkyl, optionally substituted with one or more hydroxy and/or (C₁-C₄)-hydroxyalkyl groups; -[-C_nH_{2n}-]-O-R₅; and



wherein:

n = an integer of from 2 to 8;

m = an integer of from 2 to 6;

R₅ = H; (C₁-C₈)-alkyl; (C₂-C₆)-alkenyl; -[-C_pH_{2p}-]-O-R₇, herein p is an integer of from 1 to 4 and R₇ is H or a (C₁-C₄)-alkyl group; (C₆-C₁₂)-cycloalkyl; or (C₆-C₁₂)-alkylcycloalkyl;

the radicals R₆, equal to or different from one another, are selected from

H; (C₁-C₈)-alkyl; (C₂-C₆)-alkenyl; (C₆-C₁₂)-cycloalkyl or (C₆-C₁₂)-alkylcycloalkyl; and (C₁-C₄)-hydroxyalkyl; or the moiety N(R₆)₂

is replaced by an N-heterocyclic radical selected from aziridinyl, pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl, piperazinyl, 4-methylpiperazinyl, and 4-ethylpiperazinyl, which is linked to the alkyl chain through the nitrogen atom;

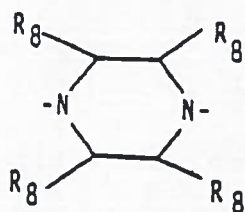
or in general formulae (I), (XII) below and (XIII) below respectively at least one of the moieties



is replaced by an N-heterocyclic radical selected from aziridinyl, pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl, piperazinyl, 4-methylpiperazinyl, and 4-ethylpiperazinyl, 2-

methylpiperazinyl, 2,5-dimethylpiperazinyl, 2,3,5,6-tetramethylpiperazinyl, 2,2,5,5-tetramethylpiperazinyl, 2-ethylpiperazinyl and 2,5-diethylpiperazinyl, which is linked to the triazine ring through the nitrogen atom;

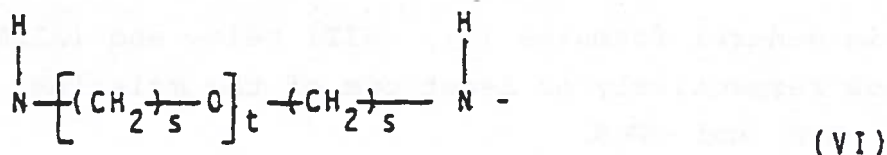
Z is selected from radicals of the following formulae:



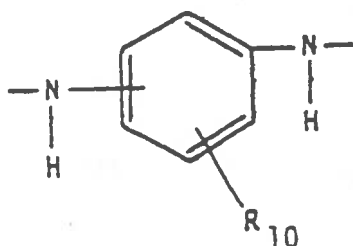
where the groups R_8 , the same or different from one another, represent hydrogen or (C_1-C_4) -alkyl;



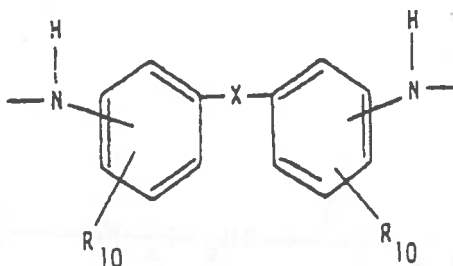
where r is an integer of from 2 to 14 and R_9 is hydrogen; (C_1-C_4) -alkyl; (C_2-C_6) -alkenyl; or (C_1-C_4) -hydroxyalkyl;



where s is an integer of from 2 to 5 and t is an integer of from 1 to 3;



(VII)

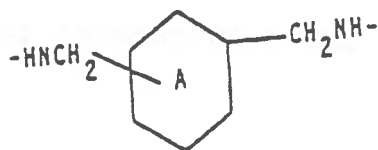


(VIII)

where:

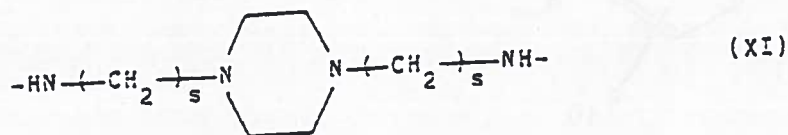
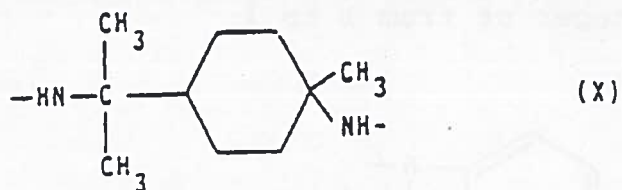
X represents a direct bond; O; S; S-S; SO; SO₂; NH; NHSO₂; NHCO; N=N; and CH₂;

R₁₀ is hydrogen; hydroxy; (C₁-C₄)-alkyl; or (C₁-C₄)-alkoxy;

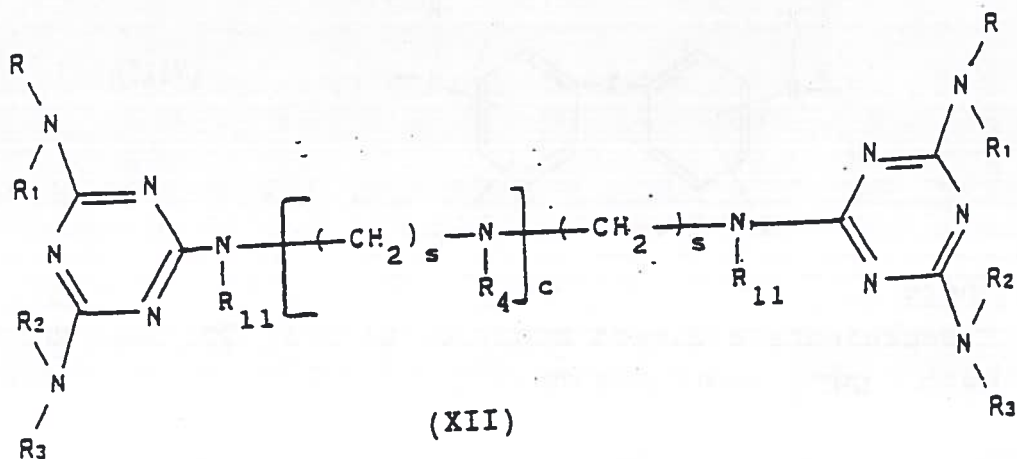


(IX)

where A is a saturated or unsaturated ring;

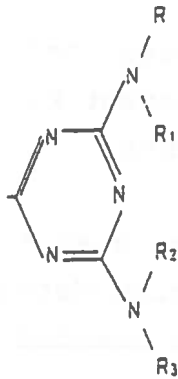


where s has the meaning defined hereinabove;
or:



where R, R₁, R₂, R₃ and s have the meanings defined hereinabove,

R₄ is hydrogen or a group of general formula

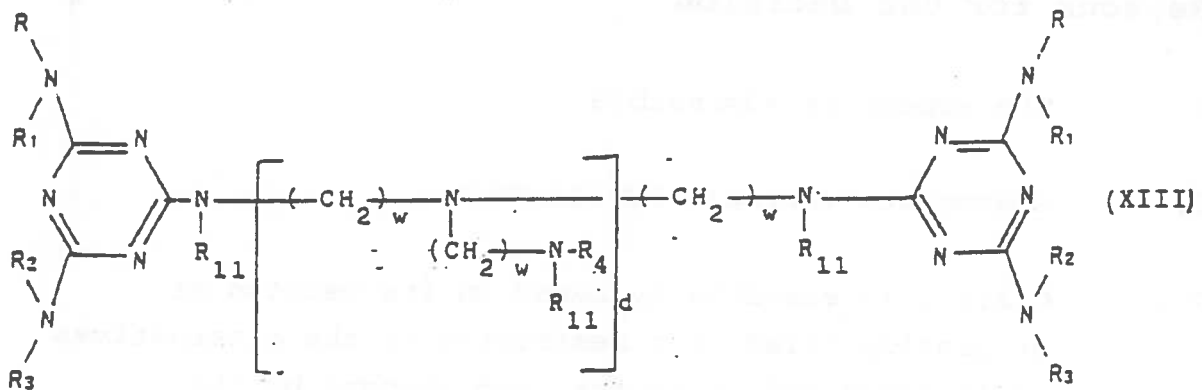


and its meaning can be different in each repeating unit;

R₁₁ is hydrogen or (C₁-C₄)-alkyl;

c is an integer of from 1 to 5;

or:



where:

R, R₁, R₂, R₃, R₄ and R₁₁ have the meanings defined hereinabove;

w is an integer of from 2 to 4; and

d is either 1 or 2."

Claims 2 to 8 are dependent on Claim 1, Claim 9 relates to moulded articles obtained from the compositions according to any of the preceding claims.

VI. The Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following documents:

Claims: No. 1 to 9 as filed with the Appellant's submission dated 6 April 1999 and as further amended by the Board on 16 April 1999,

Description: pages 1, 2, 16 to 41 and 47 to 52 as originally filed;
pages 3 to 15 and 42 to 46 as filed with the Appellant's submission dated 6 April 1999 and as further amended by the Board on 16 April 1999.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments (Article 123(2) EPC)*

2.1 Claim 1 is essentially based on its version as originally filed, but restricted to the alternatives "b is zero" and "b is one" and amended by the following remodelling of the definitions of formulae (I), (XII) and (XIII):

- formula (I) of present Claim 1 corresponds to formula (I) of original Claim 1 with "b" being zero;
- formula (XII) of present Claim 1 corresponds to formula (I) of original Claim 1 with "b" being one and the unit $-Z-[-N\{[-Z_2-]_a\}-Z_1-]$ corresponding to formula (XII) of original Claim 1;

- formula (XIII) of present Claim 1 corresponds to formula (I) of original Claim 1 with "b" being one and the unit $-Z-[-N-{\{Z_2\}_a}-Z_1-]$ corresponding to formula (XIII) of original Claim 1.

2.2 Furthermore, Claim 1 has been amended over its version as filed by the introduction of the definitions of original Claims 2 and 5 of the N-heterocyclic radicals replacing the moieties and $-NRR_1/-NR_2R_3$ and $-N(R_6)_2$.

2.3 Claims 2 to 6 and 9 correspond, in this order, to original Claims 3, 4, 6 to 8 and 10; original Claim 9 has been split into amended Claims 7 and 8.

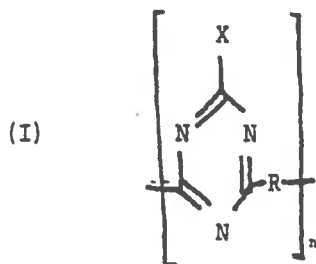
2.4 The requirement of Article 123(2) EPC is therefore complied with by all claims.

3. Novelty (Article 54 EPC)

3.1 Document D1

This document (cf. Claims 1 and 3) relates to self-extinguishing polymeric compositions based on thermoplastic polymers, e.g. polypropylene, comprising for 100 parts by weight of total compositions:

- (1) from 10 to 20 parts by weight of an ammonium phosphate or an amine phosphate,
- (2) from 5 to 8 parts by weight of a nitrogenous water-insoluble compound, consisting of an oligomer or a polymer of a 1,3,5-triazine derivative, and having the general formula



wherein:

X is a group of the formula R_1 -NH- or a heterocyclic group containing at least a nitrogen atom in the ring and linked to the triazinic ring through one of such nitrogen atoms,

R_1 is an alkyl group containing from 1 to 20 carbon atoms or a cycloalkyl group containing from 6 to 20 carbon atoms,

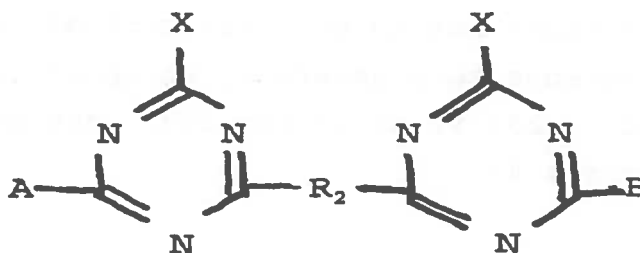
R_2 is a divalent radical of 1,4-piperazine or a divalent radical of the type $\text{-NH-(CH}_2\text{)}_m\text{-NH-}$,

n is an integer from 2 to 50, extremes included, and m is an integer from 2 to 6, extremes included.

D1 is silent on the terminal groups of the oligomers according to the afore-mentioned formula (I).

According to page 5, lines 13 to 27 the compounds of formula (I) are prepared by first reacting cyanuric acid chloride with an amine of the formula $R_1\text{NH}_2$ or with a N-heterocyclic compound in a molar ratio of 1:1, thus obtaining the 4-amino derivative of 2,6-dichloro-1,3,5-triazine, which compound is further reacted with an amine of the formula $\text{H}_2\text{N-(CH}_2\text{)}_m\text{-NH}_2$ or with piperazine or an alkyl-substituted derivative thereof, or with a mixture of such compounds, "employing a molar ratio between triazine derivative and amine and/or piperazine equal to 1:1".

- 3.2 It was argued in the appealed decision that, for $n = 2$, the definition of compound (I) of D1 encompassed dimers of the formula



where $A = B = R_2H$, this being a compound falling under the definition of formula (I) of present Claim 1.

In the Examining Division's opinion that meaning of the radicals A and B followed from the fact that the skilled person wishing to produce dimers would react two moles of 2,6-dichlorotriazine with three moles of diamine HR_2H ; he would do so, because it would be within the ambit of his general common knowledge that, in order to get a polycondensation degree of n, one had to use n moles of the first monomer and (n+1) moles of the second monomer.

3.3 For the following reasons, the disclosure of D1 does not comprise an unambiguous teaching of a dimer of the afore-mentioned formula (I) having terminal groups $A = B = R_2H$.

3.3.1 Firstly, the Examining Division's reliance on the skilled person's knowledge that, in order to get a polycondensation degree of n, one has to react n moles of the first monomer with (n+1) moles of the second monomer, is a mere allegation not supported by any document or other evidence. Such a practice is not in accordance with the principle governing the procedures before the EPO, namely that an objection of this kind, when it is contested (and it was contested: see i.a. point 5 of the Facts and Submissions of the appealed

decision) has to be substantiated, e.g. by way of reference to a generally accepted textbook (cf. T 234/93 of 15 May 1997, not published in OJ EPO, Reasons 4).

3.3.2 Secondly, the assumption that the skilled person aiming at dimers would react two moles of 2,6-dichlorotriazine with three moles of diamine HR₂H is at variance with the statement on page 5, lines 22 to 27 of D1 that the dichlorotriazine is reacted with the diamine/piperazine at a molar ratio equal to 1:1.

3.3.3 This statement in D1 is furthermore corroborated by the molar ratios used according to Examples 1 to 4 of D1, which show an amine excess of at most about 5% (cf. Example 4, ratio = 20:21,04):

	Example 1	Example 2	Example 3	Example 4
2,6-dichloro-4-piperidine-1,3,5-triazine	42,2p MW: 233 = 0,181 m			58,3p MW: 233 = 0,250 m
2,6-dichloro-4-t-octylamine 1,3,5-triazine		69,3p MW: 277 = 0,250 m		
2,6-dichloro-4-morpholine-1,3,5-triazine			40p MW: 235 = 0,170 m	
piperazine MW: 86	16,3p = 0,1895m	22,2p = 0,258 m	15,5p = 0,180 m	
hexamethylene diamine MW:116				30,5p = 0,263 m
molar ratio triazine/amine	12:12,56	15:15,48	15:15,88	20:21,04
degree n of polycondens.	12	15	15	20

While at first sight the molar ratio of 20:21 according to Example 4 - cited by the Examining Division in order to support its point of view that the skilled person setting out to achieve a degree of polycondensation of n would use n parts of triazine and $(n+1)$ parts of amine - seems to confirm the Examining Division's view, this conclusion is not in line with the totality of the information arising from these examples, because the molar ratio triazine/amine used according to Examples 1 to 3 is in all these case below a ratio $n/(n+1)$. The deviation from the Examining Division's hypothesis is particularly conspicuous with respect to Examples 2 and 3, which have the same degree of polycondensation $n = 15$, but quite different molar ratios of, respectively, 15:15,48 and 15:15,88. As a consequence of these molar ratios, according to the Examining Division's hypothesis Examples 2 and 3 should not have a degree of polymerization of 15, but Example 2 should have one of of about 30 ($=15 \times 2$) [$n=30$, $(n+1)=31$] and Example 3 should have one of of about 17 ($=15 \times 1,13$) [$n=17$, $(n+1)=18$].

Thus, these data confirm that the molar ratio dichlorotriazine/amine to be employed according to D1 is about 1:1 (with some excess of amine) and thus essentially different from a molar ratio of 2:3 = 1:1,5 as assumed by the Examining Division.

- 3.4 In view of this molar ratio of about 1:1 it is highly unlikely that dimers are formed, in which, due to the stoichiometric excess of amine, both terminal groups A and B are $-R_2H$. Conversely, it is much more likely that the group A, which in the starting triazine compound is a chlorine atom, if not remaining unchanged, will - under the influence of the large quantities of caustic soda present in the reaction mixture - be converted into an $-OH$ group.

3.5 The criterion of unambiguous anticipation to be met by a disclosure on which the denial of novelty of a claimed subject-matter hinges is thus clearly not met by the dimeric triazine derivatives encompassed by the definition of formula (I) in Claim 1 of D1.

3.6 The subject-matter of present Claim 1 is thus novel over document D1.

4. *Inventive step (Article 56 EPC)*

4.1 Problem and solution

4.1.1 It was argued in point 4 of the decision under appeal that there was no evidence on file that "these novel triazine derivatives give rise to any technical effect other than those of D1" and that the "objective technical problem underlying any novel subject-matter ... was to provide further suitable triazine derivatives."

4.1.2 In the light of the evidence contained in the application and in D1, it can, however, be recognized that the objective technical problem underlying the subject-matter of the application in suit is the provision of polymeric compositions having **improved** self-extinguishing properties.

4.1.3 This conclusion results from a comparison of the oxygen indices achieved according to Example No. 77 (Table 2, page 48) of the application in suit and according to Example 6 (Table, page 14) of D1 (cf. application in suit: pages 47 to 49 and Table 1 on page 42 [product Example No. 21 used according to Example No. 77]; document D1: page 10, line 1 to

page 11, line 9, especially Example 3, formula (VI) and page 11, line 27 to page 13, line 6 [preparation of the test samples]).

4.1.3.1 A comparison of these data is meaningful because the compositions tested according to these examples contain essentially the same ingredients in very similar amounts and have been tested according to the same method:

Both compositions comprise

- (1) isotactic polypropylene (PP) having a melt index of 12,
- (2) ammonium polyphosphate (APP),
- (3) antioxidant (AO) mixture comprising dilauryl thiopropionate and pentaerythritol tetra[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] (albeit in different weight ratios, namely 2:1 according to the application and 3:2 according to D1); and
- (4) in both cases the oxygen index has been determined according to ASTM D-2863 in a Stanton Redcroft instrument on 3 mm thick samples, which have been prepared in a plate press at a pressure of 40 kg/cm².

Example	product formula I			parts by weight				L.O.I. ASTM D-2863
	NR ₁	NR ₂ R ₃	Z-M	pro- duct	PP	AO	APP	
"inven- tion" Ex.No.77	morpho- line*	NH ₂ *	pipe- razine*	7.5*	76	1	15.5	31.7
D1 Ex.No.6	morpho- line*	term. group*	pipe- razine*	6*	78	1	15	28.0

* product according to the application in suit, Product Example No. 21

* product according to D1, Example 3, formula (VI)

This comparison shows an increase of the oxygen index by a value of 3.7 when the dimeric triazine derivative according to Example No. 77 of the present application is used in lieu of the oligomer (compound of formula VI, polycondensation degree of 15) according to Example No. 3 of D1.

4.1.3.2 This enhancement of the oxygen index is to be attributed mainly to the use of the different triazine derivative (i.e the dimer), because it can be deduced from a comparison of the otherwise identical Examples 2 and 4 of D1 that the small differences of the amounts of the respective ingredients according to Examples No. 77 of the application and No. 6 of D1 do not have an important influence on the change of the oxygen index:

Example	product formula I			parts by weight				L.O.I. ASTM D-2863
	NR ₁ R ₁	NR ₂ R ₃	Z-M	pro- duct*	PP	AO	APP	
D1 Ex.No.2	pipe- ridine*	term. group*	pipe- razine*	6	78	1	15	29.5
D1 Ex.No.4	pipe- ridine*	term. group*	pipe- razine*	6*	75	1	18	30.0

* product according to D1, Example 1, formula (II)

The above comparison shows that the oxygen index is enhanced by a value of 0.5 when the amount of PP is reduced by 3 parts and the amount of APP is increased by 3 parts. This enhancement of the oxygen index is far less important than that of 3.7 obtained when the compositions according to Example No. 77 of the application and according to D1, Example 6 are compared, in which case the amount of PP was reduced by 2 parts, the amount of APP was increased by 0.5

parts and the amount of triazine product was increased by 1.5 parts (i.e. increase of total amount of flame retardant APP + triazine product = 2 parts).

4.1.3.3 The conclusion that the self-extinguishing properties of the compositions according to the application in suit are superior to those according to D1 is also supported by the fact that the oxygen indices of several compositions referred to in Table 2 of the application, which are similar to Example No. 77, are consistently above 31, while the mean value of the oxygen index of the seven compositions referred to in the table on page 14 of D1 is (only) 28.2:

Ex. Nr.	product formula I			parts by weight				L.O.I. ASTM D2863
	NRR ₁	NR ₂ R ₃	Z-M	product	PP	AO	APP	
61	thio-morpholine	OH-ethyl-amine	ethylene-diamine	6.0	78	1	15.0	31.8
79	OH-ethyl-amine	NH ₂	pipe-razine	7.0	78	1	14.0	33.1
80	OH-ethyl-amine	OH-ethyl-amine	phenylene-diamine	7.5	77	1	14.5	34.5
91	HN-et-O-et-OH	NH ₂	pipe-razine	8.0	75	1	16.0	32.9
96	HN-et-O-vinyl	NH ₂	pipe-razine	8.0	75	1	16.0	32.9

4.1.4 The evidence discussed in the previous Section shows that the existing technical problem has effectively been solved.

4.2 Obviousness

While according to the wording of Claim 1 document D1 encompasses the use of dimers of triazine derivatives of formula (I), this document does not suggest that the choice of dimers would be able to solve the existing technical problem, i.e. to provide **improved** self-extinguishing properties (cf. point 4.1.2 supra).

Thus, the subject-matter of present Claim 1 is not obvious in the light of document D1.


The same conclusion applies *a fortiori* to the subject-matter of independent Claim 9 relating to moulded articles from the compositions according to Claim 1 and to Claims 2 to 8 which are dependent on Claim 1.

Since D1 is the only document cited in the European Search Report, it can be acknowledged that the subject-matter of the application in suit complies with the requirement of Article 56 EPC.

Order**For these reasons it is decided that:**


1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of the documents as specified in point VI supra.

The Registrar



E. Görgmayer

The Chairman:



C. Gérardin

For these reasons it is hereby stated:

The decision under appeal is set aside.

The case is referred to the Standing Committee with the order to grant a review on the basis of the documents as specified in the order of appeal.

The Chairman

The Registrar

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[Handwritten signature]

The Registrar