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D E C I S I O N
of 7 August 1997

Case Number: T 0882/94 - 3.3.3

Application Number: 85305156.3

Publication Number: 0171941

IPC: C08K 5/34

Language of the proceedings: EN

Title of invention:

Weather resistant polyacetal resin composition

Patentee:

POLYPLASTICS CO. LTD.

Opponent:

Ciba Specialty Chemicals Holding Inc.
E.I. Du Pont de Nemours and Company

Headword:

-

Relevant legal provisions:

EPC Art. 56, 114(2), 123(2)

Keyword:

"Amendments - added subject-matter (no)"
"Late submitted material in support of an objection which was
not the basis of the decision under appeal - documents not
admitted"
"Inventive step - main request (no): obvious improvement -
auxiliary request: remittal (yes)"

Decisions cited:

T 0012/81, T 0551/89, T 0506/92, T 1002/92

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0882/94 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 7 August 1997

Appellant:
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 9 September 1994
revoking European patent No. 0 171 941 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: C. Gérardin
Members: P. Kitmantel
J. A. Stephens-Ofner

Summary of Facts and Submissions

I. European patent application No. 85 305 156.3 in the name of POLYPLASTICS CO. LTD. which had been filed on 19 July 1985, claiming priority from a JP application filed on 27 July 1984, resulted in the grant of European patent No. 171 941 on 21 March 1990, on the basis of five claims. Independent Claims 1 and 2 read as follows:

"1. A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of an aromatic benzoate compound as a stabilizer and (B) 0.01 to 2.0 percent by weight of a hindered amine compound."

"2. A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a stabilizer selected from a benzophenone compound and a benzotriazole compound and (B) 0.01 to 2.0 percent by weight of a hindered amine compound selected from bis(2,2,6,6-tetramethyl-4-piperidyl)sebacate, and dimethyl succinate 1-(2-hydroxyethyl)-4-hydroxy-2,2,6,6-tetramethyl piperidine polycondensate."

Claims 3 to 5 were dependent upon Claims 1 and 2.

II. Notice of Opposition requesting revocation of the patent in its entirety on the grounds of Article 100(a) EPC was filed by CIBA-GEIGY AG (Opponent I) on 18 December 1990, and by E.I. DU PONT DE NEMOURS AND COMPANY (Opponent II) on 21 December 1990.

Both Opponents contended that the claimed subject-matter lacked novelty and/or inventive step (Article 54 and 56 EPC) *inter alia* over the following documents:

D5: Gächter, Müller "Taschenbuch der Kunststoffadditive" C.Hanser-Verlag, 1983, pages 185 to 188;

D6: consisting of

- a Du Pont letter of 20 January 1984 from H. Moncure to R.A. Fleming;
- two sheets, both headed "CIBA-GEIGY Limited KA 7.513/MUT/ms", concerning Ciba-Geigy UV-absorber Tinuvin^(R) 328 and Ciba-Geigy HALS light stabilizers Tinuvin^(R) 770 and 622,
- one sheet headed "CIBA-GEIGY Dr. U. Kammer KA 7.5.13" and entitled "Lightstabilisers for POM";

D11: US-A-3 907 803; and

D13: "Wheathering of Polymers" by A. Davis/A. Sims, Applied Science Publishers, London and New York, 1983, pages 120 to 127 and 148 to 153.

III. By its decision issued in writing on 9 September 1994 the Opposition Division revoked the opposed patent.

That decision was based on a set of five claims comprising as sole independent claim the following amended Claim 1:

"A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a benzotriazole compound as a stabiliser, (B) 0.01 to 2.0 percent by weight of a hindered amine compound and (C) carbon black."

It was held in that decision that the subject-matter of Claim 1 was novel, because document D11 did not disclose in combination the components specified in that claim, and because the allegation of prior public use based on evidence D6 was not sufficiently substantiated.

However, according to that decision the subject-matter of Claim 1 lacked an inventive step, because it was considered obvious to add carbon black as an additional UV absorber/light stabilizer to the polyacetal compositions disclosed in document D5. On the one hand, this was already suggested in D5 and, on the other hand, the use of carbon black for improving the weather stability of hydroxybenzotriazole stabilized polyacetal resins was also disclosed in document D13.

IV. On 8 November 1994 the Patentee (Appellant) lodged an appeal against the decision of the Opposition Division and simultaneously paid the appeal fee. On 11 January 1995 he submitted the Statement of Grounds of Appeal.

IV.1 Together with that Statement he filed a new set of four claims comprising as sole independent claim the following amended Claim 1:

"A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a benzotriazole compound as a stabiliser, (B) 0.01 to 2.0 percent by weight of hindered amine compound bis(2,2,6,6-tetramethyl-4-piperidine)sebacate and (C) carbon black."

IV.2 With his letter dated 28 February 1996 the Appellant filed a set of "Supplementary" Claims 5 to 8, from which set Claim 5 was again deleted by letter dated 20 December 1996.

Independent Claims 6 and 7 of this set read as follows:

"6. A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a stabilizer selected from a benzophenone compound and a benzotriazole compound, (B) 0.01 to 2.0 percent by weight of a hindered amine compound selected from bis(2,2,6,6-tetramethyl-4-piperidine)sebacate, and dimethyl succinate 1-(2-hydroxyethyl)-4-hydroxy-2,2,6,6-tetramethylpiperidine polycondensate and (C) one or more dyes and pigments."

"7. A polyacetal resin composition, which comprises a polyacetal resin as the matrix, (A) 0.01 to 2.0 percent by weight of a benzotriazole compound as a stabiliser, (B) 0.01 to 2.0 percent by weight of a hindered amine compound bis(2,2,6,6-tetramethyl-4-piperidine)sebacate and (C) one or more dyes and pigments."

Claim 8 relates to a preferred embodiment of Claim 7.

IV.3 During oral proceedings (see point VI below) the Appellant split the previously submitted single set of Claims 1 to 4 and 6 to 8 into a Main Request comprising Claims 1 to 4 and an Auxiliary Request comprising Claims 6 to 8.

IV.4 The Appellant argued that the novelty objection against the subject-matter of Claim 1 brought forward by the Respondent I and based on the new evidence contained in page 1 of document

D6a: internal Ciba-Geigy report headed "Dr. U. Kammer KA 7.5.13", entitled "Xenotest 1200 and Weatherometer Exposure of 1 mm POM-Copolymer Pressed Plaques"

should not be admitted into the proceedings because it constituted a new ground of opposition (cf. point V.2 below).

IV.5 In the Appellant's opinion, Claim 1 complied with the requirement of Article 123(2) EPC, because the application as filed - in particular Claim 1, Example 5 in Table 1 and the last paragraph of page 6 - afforded sufficient support for the amendments.

IV.6 With respect to the issue of inventive step of Claim 1, the Appellant, in his written and oral submissions, relied mainly on conclusions to be drawn, on the one hand, from Examples 1 and 5 and Comparative Example 1, all comprised by Table 1 of the patent in suit, and, on the other hand, from Comparative Example 7 in Table 2 of the patent in suit.

According to these examples the addition of carbon black to polyacetal compositions comprising a benzotriazole stabilizer and the hindered amine light stabilizer (hereinafter "HALS") bis(2,2,6,6-tetramethyl-4-piperidine)sebacate led to a synergistically enhanced crack occurrence time. This effect could not be expected from the information contained in document D5, the closest prior art, which disclosed only that carbon black was a good stabilizer for polyacetal compositions but did not suggest a 3-component synergism between the three stabilizer components: benzotriazole, HALS and carbon black.

Moreover, the most relevant embodiments of D5 (last entries in Tables 37 and 38, respectively) disclosed polyacetal compositions comprising a benzotriazole stabilizer in combination with HALS-V, i.e. bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate, the latter HALS-compound being different by one extra methyl group from the HALS to be used according to

present Claim 1, i.e. bis(2,2,6,6-tetramethyl-4-piperidine)sebacate. In the Appellant's view one skilled in the art was aware of the tremendous influence such an albeit minor change in the structure of a stabilizer compound may have on its properties and he would not, therefore, consider the tetramethyl-substituted compound to be an obvious alternative for the pentamethyl-substituted compound.

V. The arguments of the Respondents I and II (Opponents I and II) advanced, respectively in their written and oral submissions, may be summarized as follows:

V.1 Claim 1 did not comply with the requirement of Article 123(2) EPC because the combination of any benzotriazole stabilizer with the specific HALS bis(2,2,6,6-tetramethyl-4-piperidine)sebacate and with carbon black amounted to a non-disclosed selection from three lists of ingredients (UV stabilizers, HALS and colorants).

V.2 Claim 1 was not novel over the disclosure on page 1 of document D6a, which mentioned a POM-copolymer composition comprising 2-(2'-hydroxy-3',5'-di-t-amyphenyl)benzotriazole (= Tinuvin^(R) 328), bis(2,2,6,6-tetramethyl-4-piperidine)sebacate (= Tinuvin^(R) 770) and carbon black (Printex^(R) 60).

According to Respondent I, the availability of page 1 of document D6a to the public was proved by documents D14 (CG-6 of Respondent I): a letter from T. Hanabusa dated 20 June 1994,
and

D15 (CG-7 of Respondent I), comprising

- declarations of, respectively, M. Hamada and T. Watanabe, both dated 23 May 1994 (= CG-7/1 and CG-7/2 of Respondent I),
- a letter of T. Watanabe to Mr. Hamada, Asahi Chemical Industry Co., Ltd (= CG-7/7 of Respondent I)
- technical information bulletins from Ciba-Geigy for Tinuvin^(R) 328, Tinuvin^(R) 770 and Irganox^(R) 259, and from Degussa for Printex^(R) carbon blacks (= CG-7/3 to CG-7/6 of Respondent I), all filed on 19 August 1996.

V.3 A synergistic effect on the properties of the compositions, caused by the additional presence of carbon black, could not be inferred from Example 5 of Table 1 of the patent in suit, because the total amount of stabilizers used according to this example was twice that used according to Example 1. Nor could a synergy be inferred from a comparison with Comparative Example 7 in Table 2 of the patent in suit. On the one hand, this comparative example used carbon black as the only stabilizer and did not, therefore, represent the closest prior art (D5), and, on the other hand, the less than 2-fold improvement of the crack occurrence time caused by the addition of 0.5% carbon black according to Example 5 to the compositions of Example 1, only confirmed the linear improvement of this property to be expected from the 4-fold improvement of the crack occurrence time brought about by the addition of 1% carbon black according to Comparative Example 7.

V.4 The substitution of bis(2,2,6,6-tetramethyl-4-piperidine)sebacate for bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate as HALS in the polyacetal compositions disclosed in document D5 (last entries in Tables 37 and 38 on pages 186 and 187) did not involve any inventive step, and it was obvious that the weather stability of such compositions could be further improved by addition of carbon black.

V.5 New Claims 6 to 8 were inadmissible, since by the replacement in the claimed compositions of "carbon black" by "dyes and pigments" entirely new subject-matter was created, different from that discussed during the whole opposition proceedings. Moreover, in the Respondents' view, the restriction of the claims in the first instance opposition proceedings to compositions comprising carbon black amounted to an unrenouncable waiver or estoppel.

V.6 Even if Claims 6 to 8 were admitted, their subject-matter would not be patentable over document

D16: EP-A-112 726,

because the polyacetal compositions disclosed therein differed from those according to these claims only by the obvious use of a different HALS: Tinuvin^(R) 144 in lieu of Tinuvin^(R) 770 or Tinuvin^(R) 622, which change was not proved to give rise to any unexpected effect.

The new experimental evidence submitted on 27 June 1997 in order to demonstrate such an unexpected effect was inadmissible because it had been filed too late.

But even if it were admitted, it was inconclusive, because the only synergistic effect shown was that according to sample 5 between a benzotriazole UV absorbant and a sterically hindered amine, a synergism well known for long time, e.g. from documents:

D2: US-A-4 110 304, and

D17: EP-A-16 723.

VI. Oral proceedings were held on 7 August 1997.

VI.1 During these proceedings doubts were raised concerning the compliance of, on the one hand Claims 1 to 4, and , on the other hand Claims 6 to 8, with the requirement of Article 82 EPC (unity of the invention), because the respective subject-matters appeared to be concerned with the solution of different problems, namely:

Claims 1 to 4: improved weather resistance in terms of crack occurrence time, tensile strength and surface condition (page 2, lines 34 to 35; page 4, lines 23 to 24 and page 5, lines 6 to 9 in combination with the results in Tables 1 and 2 of the patent in suit);

Claims 6 to 8: prevention of fading and discoloration (page 4, lines 19 to 21 of the patent in suit).

This was not disputed by the Appellant who decided thereafter to split the two subject-matters into different sets of claims corresponding to a main and an auxiliary request.

VI.2 The Board dismissed the novelty objection of Respondent I (see point V.2 supra), because it was filed late and was not sufficiently relevant to be admitted into the appeal proceedings at this stage. The documents D6a, D14, D15 were therefore not admitted for consideration.

VII. The Appellant requested (by way of Main Request) that the decision under appeal be set aside and the patent be maintained on the basis of Claims 1 to 4 submitted during oral proceedings, or that Claims 6 to 8, also submitted during oral proceedings as Auxiliary Request, be referred back to the Opposition Division for further prosecution.

The Respondents requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

Main Request

2. *Article 123(2) and (3) EPC*

2.1 Claim 1 differs from its version as filed (i) by the restriction of the stabilizer components (A) and (B), respectively, to benzotriazole compounds and to bis(2,2,6,6-tetramethyl-4-piperidine)sebacate, and (ii) by the addition of carbon black as further stabilizer component.

2.2 As a basis for this change, the original application comprises the following relevant information:

- 2.2.1 According to original Claim 1 the stabilizer component (A) comprised "a benzotriazole compound, a benzophenone compound and an aromatic benzoate compound".
- 2.2.2 Compounds which may be used as stabilizer component (B) are set out on page 3, line 29 to page 5, line 5 of the original application. Bis(2,2,6,6-tetramethyl-4-piperidine)sebacate is comprised by that list (page 4, line 6).
- 2.2.3 Carbon black is mentioned on page 7, lines 7 to 9 of the original application as a possible additive "effective in further enhancing the weathering (light) stability of the compound" when used "in combination with the weathering stabilizers". This statement amounts to the general teaching that carbon black may be used together with any combination of additives within the terms of the original application, thus in particular with any combination of (A) benzotriazole compound and (B) HALS.
- 2.2.4 Example 5 referred to in Table 1 (page 9) of the original application uses a combination of stabilizer components A-1 (2-[2'-hydroxy-3',5'-di-t-amyl phenyl]benzotriazole), B-1 (bis(2,2,6,6-tetramethyl-4-piperidine)sebacate) and carbon black.
- 2.2.5 According to Examples 6, 7 and 8 referred to in Table 2 (page 11) of the original application a combination of the stabilizer components A-3 (2-[2'-hydroxy-5'-methyl phenyl]benzotriazole) and B-1 is used (not comprising carbon black).
- 2.3 From the fact that the original application discloses stabilizer compositions comprising bis(2,2,6,6-tetramethyl-4-piperidine)sebacate in combination with two specific benzotriazole compounds (see points 2.2.4 and 2.2.5 supra) and from the absence of any

information in the original application militating against the use of other benzotriazole stabilizer compounds in combination with the same HALS, it results that the original application provides support for the use of stabilizer compositions in polyacetal which combine the class of benzotriazole stabilizers with the HALS bis(2,2,6,6-tetramethyl-4-piperidine)sebacate.

In view of the disclosure of Example 5 in Table 1 (see point 2.2.4 supra) and the statement on page 7, lines 7 to 9 (see point 2.2.3 supra), the same conclusion applies with respect to such stabilizer compositions which, in addition to a benzotriazole compound and bis(2,2,6,6-tetramethyl-4-piperidine)sebacate, comprise carbon black.

Consequently, the subject-matter of Claim 1, which relates to polyacetal compositions comprising such stabilizer compositions, is fairly based on the disclosure in the original application.

- 2.4 The opinion of the Respondents, namely that the subject-matter of Claim 1 would amount to an arbitrary combination of three components from three lists is not in agreement with the facts outlined above.

First, carbon black is disclosed in the original application as a general additive, secondly, the combination of benzotriazole stabilizers with HALS compounds is specially exemplified, disclosing thereby the combination of these two classes of compounds, and thirdly, the particular selected HALS compound bis(2,2,6,6-tetramethyl-4-piperidine)sebacate is exemplified in combination with benzotriazole stabilizers.

Thus, the combination of the class of benzotriazole stabilizers with the specific HALS bis(2,2,6,6-tetramethyl-4-piperidine)sebacate and with carbon black does not involve a new element and does not, therefore, infringe upon Article 123(2) EPC (cf. T 12/81 OJ EPO 1982, 296; penultimate sentence of Reasons 14.3).

- 2.5 The definition of the stabilizer combination in Claim 1 corresponds to that of granted independent Claim 2. It differs therefrom (i) by the restriction of the definition of the stabilizer components (A) and (B) and (ii) by the addition of carbon black as further stabilizer component.

Claim 1 is therefore narrower in scope than Claim 2 as granted and, thus, complies with the requirement of Article 123(3) EPC.

3. Novelty

- 3.1 In application of Article 114(2) EPC the novelty objection of Respondent I, which was based on documents 6a, D14 and D15, is not admitted into the appeal proceedings, because it was only submitted during the appeal stage and was *prima facie* not sufficiently relevant, i.e. relevant to the extent that its admission would be likely to prejudice the maintenance of the patent in suit. In the Board's judgment, the legal principles set out in T 1002/92 (OJ EPO 1995, 605; Reasons 3.4) are clearly applicable in this case.

- 3.2 Document D5 is a general textbook for plastics additives. Section 3.5.8 on pages 185 to 188 is concerned with the light stabilization of polyacetals. Tables 37 and 38 on pages 186 and 187 disclose some

examples of stabilized polyacetal compositions, among which one composition comprising 0.25% HALS-V and 0.25% UVA-V (Table 37, last entry), and another one comprising 0.25% HALS-V and 0.25% UVA-XV (Table 38, last entry).

HALS-V is bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate, UVA-V is 2-(2'-hydroxy-5'-methylphenyl)benzotriazole and UVA-XV is 2-(2'-hydroxy-3',5'-di-t-amyl-phenyl)benzotriazole (see definitions on top of page 186).

3.3 In the last paragraph on page 187 of D5 it is set out that carbon black in amounts of 0,5 to 0,3% is a good stabilizer and may be used if colour is of no concern. The effectiveness of carbon black as only light stabilizer in a polyacetal copolymer is illustrated by the results in Table 36.

3.4 Polyacetal compositions comprising as light stabilizer bis(2,2,6,6-tetramethyl-4-piperidine)sebacate are not disclosed, nor is there any disclosure in D5 of the joint use of carbon black, benzotriazole and HALS compounds.

3.5 The subject-matter of Claim 1 is therefore novel over document D5.

4. *Inventive step*

4.1 Closest prior art

There was agreement among the parties that D5 represents the closest state of the art. This is also the position of the Board.

From the most relevant embodiments disclosed in D5 (last entries in Tables 37 and 38; see point 3.2 supra) the subject-matter of Claim 1 of the patent in suit differs in that

- (i) the HALS (bis(2,2,6,6-tetramethyl-4-piperidine)sebacate) comprises one methyl group less than the HALS-V (bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate) used according to these embodiments, and in that
- (ii) the stabilizer compositions used according to present Claim 1 additionally comprise carbon black.

4.2 Problem to be solved

The problem to be solved by the patent in suit is the provision of polyacetal compositions having improved weathering stability in terms of crack occurrence time, tensile strength and surface condition (original application: page 2, lines 22 to 23; page 8, last paragraph; patent specification: page 2, lines 34 to 35; page 5, lines 6 to 9).

4.3 Solution of the problem

According to Claim 1 the afore-mentioned problem is solved by the provision of polyacetal compositions, which - as compared to the closest embodiments disclosed in D5 (see point 4.1 supra) - comprise a different HALS (bis(2,2,6,6-tetramethyl-4-piperidine)sebacate in lieu of bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate) and which as a further stabilizer component comprise carbon black.

The test results of Example 5 in Table 1 of the patent in suit show that by these measures the problem set out in the previous paragraph has effectively been solved.

This is particularly illustrated by the improvement of the desired properties in respect to the compositions according to Example 1, which contain the same stabilizers A-1 and B-1 in the same amounts as according to Example 5, but which compositions do not contain carbon black: according to Example 5 the crack occurrence time is enhanced from 420 to 720 hours, the tensile strength and the elongation after 1000 hours of irradiation are maintained at a higher level of, respectively, 640 kg/cm and 25% (as compared to 574 kg/cm and 18%), and the surface condition after 600 hours of irradiation is also improved (mark "1" as compared to mark "2").

4.4 Obviousness

4.4.1 The next issue to decide is whether it would have been obvious, when starting from the most relevant embodiments disclosed in D5, to solve the existing technical problem by the measures taken according to Claim 1, i.e. by the use of a different HALS and the addition of carbon black.

4.4.2 HALS

The substitution of bis(2,2,6,6-tetramethyl-4-piperidine)sebacate for the bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate used according to D5 amounts to the use only of a slightly different HALS, i.e. a compound having the same bis(-4-piperidine)sebacate skeleton, where the two piperidine rings are methyl-substituted in the 2,2,6,6-positions, the only difference being that the 1-methyl-substitution of the HALS-compound used according to D5 is omitted.

In the Board's judgment, one skilled in the art will not expect that this minor change in the structure of the HALS would have an important impact on the efficiency of the compound as light stabilizer in polyacetal compositions. Apparently this was also the opinion of the Appellant when he applied for the patent in suit, because in the original application he mentions both compounds, one directly after the other, in the list of appropriate HALS stabilizers (see page 3, line 29 to page 4, line 12 of the original application).

There is also no evidence available which could prove that the HALS bis(2,2,6,6-tetramethyl-4-piperidine)sebacate, when used in stabilized polyacetal compositions, is superior in any respect to the HALS bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate.

Since the restriction of Claim 1 to the use as HALS of bis(2,2,6,6-tetramethyl-4-piperidine)sebacate, which amounts to a selection, was made by the Appellant only during the appeal proceedings the burden was on the Appellant to provide evidence for any unexpected effect he claimed to exist, e.g. that this selection was not arbitrary.

As admitted by the Appellant, (bis(2,2,6,6-tetramethyl-4-piperidine)sebacate) was a well-known light stabilizer for plastics (cf. D13, page 126, compound VIII) and was even known for its synergism with benzotriazole stabilizers (cf. e.g D2: US-A-4 110 304 and D8: US-A-4 315 848).

In view of this situation, the replacement of the HALS bis(1,2,2,6,6-pentamethyl-4-piperidine)sebacate by the HALS bis(2,2,6,6-tetramethyl-4-piperidine)sebacate in the compositions disclosed in D5, Tables 37 and 38 (last entries, respectively) did not involve an inventive effort.

4.4.3 Carbon black

The sentence on page 187, last paragraph of D5 "If colour does not play a role, carbon black (0,5 to 3%) is a good stabilizer" ("Falls Farbe keine Rolle spielt, ist Ruß (0,5 bis 3%) ein guter Stabilisator") and the results for carbon black filled polyacetal compositions in Table 26 on page 186 (see especially the more than two-fold efficiency as stabilizer against deterioration of elongation at break ("Reißdehnung") of 0,5% carbon as compared to 1,0% 2-hydroxyphenyl benzotriazole in the weathering test ("Freibewitterung")) highlight the suitability of carbon black as light stabilizer in polyacetal compositions.

One skilled in the art would therefore have expected that by the admixture of carbon black to polyacetal compositions an improvement of the light stability would also be obtained when these compositions already contained other light stabilizers, like benzotriazole and HALS compounds.

The test results in Table 1, in particular the improvement of the crack occurrence time of the composition according to Example 5 over that of the composition according to Example 1, confirm this expectation. However, these results, cannot be considered as evidence for a synergistic improvement over and above the expectation.

In order to argue for the existence of such a synergistic effect the Appellant has, with his letter dated 5 December 1995, submitted a compilation of the crack occurrence time results of the compositions of Examples 1, 5 and Comparative Example 1 from Table 1, as well as of the composition of Comparative Example 7 from Table 2 of the patent in suit.

Example	weathering stabilizer (wt.-%)			crack occurrence time (hrs)
	A-1	B-1		
Example 1	A-1 0.25%	B-1 0.25%	-	420
Example 5	A-1 0.25%	B-1 0.25%	carbon black 0.5%	720
Comp.Ex. 1	-	-	-	48
Comp.Ex. 7	-	-	carbon black 1.0%	180

[A-1: 2-(2'-hydroxy-3',5'-di-t-amylphenyl)benzotriazole]
 [B-1: bis(2,2,6,6-tetramethyl-4-piperidine)sebacate]

The Appellant argued that the improvement of the crack occurrence time according to Example 5 over that according to Example 1 by 300 hrs (720 minus 420) was proof of a synergism between the three stabilizers A-1, B-1 and carbon black, because Comparative Example 7 showed that by using carbon black as the sole stabilizer in an amount equal to the total amount of stabilizers used according to Example 5 (i.e. 1%) the crack occurrence time could only be improved from 48 hrs (Comparative Example 1) to 180 hrs, i.e. by 132 hrs.

However, as pointed out by the Respondents, this reasoning is not conclusive, let alone convincing, because a more appropriate calculation of the results put together in the above table reveals that the nearly 2-fold improvement ($720/420 = 1.71$) of the crack occurrence time obtained according to Example 5 by

adding 0.5% carbon black to the composition of Example 1 is fully in line with the expectation to be drawn from Comparative Examples 1 and 7, according to which examples a 4-fold improvement ($180/48 = 3.75$) of the crack occurrence time is achieved by the use of 1% carbon black (i.e. the double amount as according to Example 5). Thus, when taking the amount of added carbon black, 0.5 or 1.0%, into account, the relative improvement of the crack occurrence time obtained according to Example 5 by addition of carbon black to the compositions of Example 1 is the same as that obtained by addition of carbon black to the compositions of Comparative Example 1.

Moreover, even if the Appellant would have been able to prove that by the addition of carbon black to benzotriazole/HALS stabilized polyacetal compositions the crack occurrence time could be improved in a synergistic fashion, this would not be considered as proof of an inventive step. In a case like the present, where it is obvious from the state of the art, here D5, that a certain measure, here the addition of carbon black, will bring about an improvement of a certain property, here weathering resistance, a surprising degree of this improvement cannot make this per se obvious measure non-obvious (cf. T 506/92 of 3 August 1995 and T 551/89 of 20 March 1990).

The addition of carbon black to the compositions disclosed in D5, Tables 37 and 38 (last entries, respectively) did not, therefore, involve an inventive effort.

- 4.4.4 Since neither of the features distinguishing the subject-matter of Claim 1 from the closest state of the art involves the exercise of inventive skill, this claim does not comply with the requirement of Article 56 EPC.

- 4.4.5 Claims 2 to 4, which are dependent upon Claim 1 must share the fate of this claim. Moreover, it appears that the features contained in these claims are the result of ordinary workmanship not requiring inventive effort.
5. In the circumstances, the Appellant's Main Request must fail.

Auxiliary Request

6. In view of the fact that the subject-matter of the auxiliary request cannot be regarded as a preferred embodiment of the main request, and because these claims have only been filed in the appeal stage, the Board refrains from a decision on this late filed subject-matter and, in application of its power under Article 111(1) EPC, remits the case to the first instance for further prosecution with respect to this Auxiliary Request.

Order

For these reasons it is decided that:

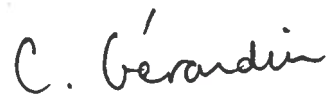
1. The decision under appeal is set aside.
2. The Appellant's Main Request is refused.
3. Claims 6 to 8, submitted as Auxiliary Request are remitted to the Opposition Division for further prosecution.

The Registrar:



P. Martorana

The Chairman:



C. Gérardin