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D E C I S I O N
of 18 March 1999

Case Number: T 0073/95 - 3.3.3

Application Number: 88200234.8

Publication Number: 0278579

IPC: C08K 5/00

Language of the proceedings: EN

Title of invention:

Solid stabilizer composition for organic polymers, and process
for preparing it

Patentee:

Enichem Synthesis S.p.A.

Opponent:

Ciba Spezialitätenchemie Holding AG
Sandoz Ltd.

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step - non-obvious combination of known features -
secondary indicia"

Decisions cited:

T 0079/82, T 0109/82, T 0219/83, T 0106/84, T 0229/85,
T 0009/86, T 0606/89, T 0295/94

Catchword:

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Case Number: T 0073/95 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 18 March 1999

Appellant: Ciba Spezialitätenchemie Holding AG
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Respondent: Enichem Synthesis S.p.A.
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Representative: Weinhold, Peter, Dr.
Winter, Brand, Fürniss, Hübner, Röss,
Kaiser, Polte, Kindermann
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 1 December 1994
rejecting the opposition filed against European
patent No. 0 278 579 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: C. Gérardin
Members: A. Däweritz
A. Lindqvist

Summary of Facts and Submissions

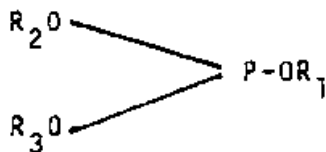
I. The mention of the grant of European patent No. 0 278 579 in respect of European patent application No. 88 200 234.8 filed on 9 February 1988 and claiming priority of 13 February 1987 of two earlier applications in Italy (1936687 and 1936887), was announced on 25 November 1992 (Bulletin 92/48) on the basis of two sets of claims.

(i) The first set contains 11 claims for the following Contracting States: AT, BE, CH, DE, FR, GB, GR, LI, LU, NL, SE.

Claim 1 reads as follows:

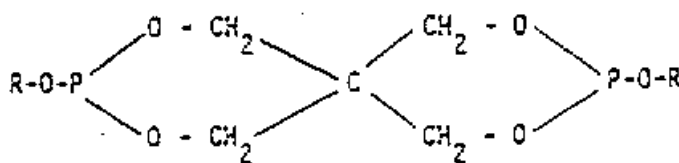
"1. A stabilizing composition for organic polymers, composed of a solid continuous dispersant phase and a dispersed solid phase, characterized in that said continuous dispersant phase consists of amorphous tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane, and the dispersed phase is selected from:

(a) an either amorphous or crystalline organic phosphite, in the form of particles having a particle size of from 10 Fm to 2 mm, said organic phosphite having a melting point higher than that of said amorphous tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane, and being selected from those having the general formula:

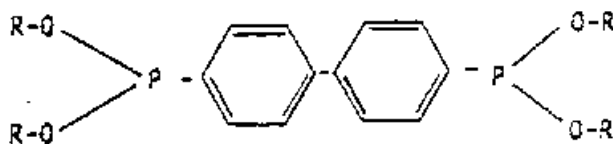


wherein R_1 , R_2 and R_3 are equal or different hydrocarbyl radicals, selected from substituted or unsubstituted alkyl, cycloalkyls, aryls, alkaryl or aralkyls, the weight ratio of said dispersant phase to said dispersed phase being from 9:1 to 1:9, or

(b) an either amorphous or crystalline organic phosphite, or phosphonite, in the form of particles having a particle size of from 50 Fm to 2 mm, said organic phosphite or phosphonite having a melting point above 100EC, and being selected from those having the general formulas:



phosonite



phosphonite

wherein R independently represents a substituted- or unsubstituted alkyl, cycloalkyl, aryl, alkaryl or aralkyl, the weight ratio of the dispersant

phase to the dispersed phase being from 9:1 to 1:9."

Claims 2 to 7 are directed to preferred embodiments of the composition of Claim 1.

Claims 8 to 11 read as follows:

"8. Process for preparing the composition of Claim 1, wherein the organic phosphite is amorphous, the powdered organic phosphite and the powdered tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane are admixed to one another, and the resultant mixture is heated to a temperature of from 160EC to 170EC, homogenized, and suddenly cooled to a temperature of from 20EC to 25EC.

9. Process for preparing the composition of Claim 1, wherein the organic phosphite is crystalline, the powdered organic phosphite and the powdered tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane are admixed to one another, and the resultant mixture is heated to a temperature of from 160EC to 170EC, homogenized, and slowly cooled to a temperature of from 80EC to 100EC, to cause the organic phosphite to crystallize, the mixture being subsequently suddenly cooled to a temperature of from 20EC to 25EC, to cause tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane to solidify in amorphous form.

10. Process for preparing the composition

according to Claim 1, wherein the organic phosphite is crystalline and that amorphous tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane is molten at a temperature of from 80EC to 100EC, the crystalline organic phosphite is dispersed within the molten mass and homogenized, the homogenized mass being then suddenly cooled to a temperature of from 20EC to 25EC.

11. Use of the compositions according to Claims 1 to stabilize organic polymers."

(ii) The second set contains four claims for the Contracting State: ES.

Claim 1 is drafted as a process claim directed to the preparation of a stabilizing composition as defined in the first set of claims and Claims 2 to 4 are identical to Claims 8 to 10 of the first set of claims.

For the sake of simplification, tetrakis[3, -(3,5-di-tert.butyl-4-hydroxyphenyl)-propionyl-oxy-methyl]methane will be referred to as "TPM" hereinafter. Similarly the term "phosph(on)ites" will encompass the various phosphorus-containing compounds according to the formulae defined in Claim 1.

II. On 24 August 1993 and 25 August 1993, Notices of Opposition were filed by two Opponents in which revocation of the patent in its entirety was requested

on the grounds of lack of novelty within the meaning of Article 54(1) and (2) EPC and inventive step within the meaning of Article 56 EPC as well as insufficiency of disclosure under Article 100(b) EPC. The objection under Article 100(b) EPC was withdrawn in the course of the opposition proceedings.

The objections were supported essentially by the following documents:

D1: GB-A-2 025 980,

D5: C. C. Swasey, "The Influence of Antioxidant Dispersion on Polymer Stability", Second International Conference on Advances in the Stabilization and Controlled Degradation of Polymers, Lucerne (CH), 2 to 4 June 1980, and

D8: US-A-4 187 212.

In the course of the opposition proceedings both the Proprietor and Opponent I submitted experimental test reports shortly before the oral proceedings.

III. By decision announced orally on 24 November 1994 and issued in writing on 1 December 1994, the Opposition Division rejected the oppositions.

(i) Regarding the late submission of experimental test reports by both parties, the Opposition Division took the view that the results thereof were not conclusive and, accordingly, decided to disregard them pursuant to Article 114(2) EPC.

(ii) In substance, the Opposition Division first held that the subject-matter of the patent in suit was novel over the cited prior art. Then, starting from D8 regarded as the closest state of the art, the Opposition Division found that it was not obvious to provide a stabilizer composition which was more resistant to hydrolysis than the known compositions. Based on this finding the Opposition Division concluded that the subject-matter claimed in the patent in suit involved an inventive step as well.

IV. On 24 January 1995 a Notice of Appeal was lodged by Opponent I (Appellant) against this decision with simultaneous payment of the prescribed fee.

In the Statement of Grounds of Appeal filed on 29 March 1995, the Appellant disputed the findings of the Opposition Division only as regards inventive step by (i) relying on four additional documents D10 to D13, in particular

D10: EP-A-0 143 464,

(ii) adopting a different problem and solution approach which was now based on D1, and (iii) submitting an additional test report.

These views and arguments were emphasized in a later submission filed on 12 January 1999 which additionally contained further experimental data. Colour pictures showing the distribution of one stabilizer in the other were submitted on 16 January 1999 and 2 February 1999.

V. On 7 February 1995 an appeal was also lodged by Opponent II which, however, was withdrawn by letter of 3 April 1995. In this letter the Board was also informed that Opponent II would take no further part in the proceedings.

VI. In its counterstatements of 22 December 1995 and 18 February 1999, the Respondent (Proprietor) relied on the same line of arguments as the Opposition Division to support inventive step. Both submissions contained further experimental evidence.

The first counterstatement additionally contained two auxiliary requests, each containing two sets of claims for the same combination of Contracting States as the granted patent.

VII. During oral proceedings held on 18 March 1999, both parties maintained their opposite views concerning (i) the document representing the closest state of the art, i.e. D1 or D8, (ii) the interpretation of the numerous experimental evidence on file, and (iii) the obviousness of the claimed subject-matter in the light of the disclosure of D1, D5, D8 and D10.

VIII. The Appellant requested that the decision under appeal be set aside and that the patent in suit be revoked in its entirety.

The Respondent requested that the appeal be dismissed or, alternatively, that the patent be maintained on the basis of one of the auxiliary requests.

Reasons for the Decision

1. The appeal is admissible.
2. In its reply of 18 February 1999, point 4, the Respondent objected to the new documents D10 to D13 being considered in the appeal proceedings in view of their late submission and their lack of relevance. Regarding D10, since the Respondent (i) had dealt in substance with this citation in its two counterstatements, and (ii) during oral proceedings no longer objected to its admission into the proceedings, the Board decided not to raise this procedural issue.

As far as the other late-filed documents D11 to D13 are concerned, in view of their lack of relevance confirmed by the absence of reference to any of them during oral proceedings the Board has decided to disregard them pursuant to Article 114(2) EPC.

3. Although the issue of novelty is no longer raised, a preliminary discussion of the two relevant documents, D1 and D8, is appropriate in order to decide which disclosure qualifies as the closest state of the art.
 - 3.1 As it appears from the introduction of the patent specification, the patent in suit is concerned with the tendency of organic phosphites to hydrolyse, in particular during the storage in a warm and moist environment, with the consequent loss of stabilizer activity, and danger of corrosion of the equipment used for processing the organic polymers when incorporating said hydrolysed phosphites (page 2, lines 17 to 20). It was not disputed between the parties that phosphonites

exhibit a similar tendency to hydrolysis. The above passage is followed by a summary of various attempts made in the prior art to overcome that specific drawback, without however providing a really satisfactory solution to it (page 2, lines 21 to 31).

3.2 D1 is directed to a process for the production of a thermoplastic organic polymer containing an additive capable of improving its properties, comprising the steps of incorporating into the thermoplastic organic polymer a composition comprising a uniform blend of the additive and an indicator substance which gives a detectable response to irradiation, subjecting at least part of the product to the irradiation to which said indicator substance is responsive and determining from the degree of response the amount of the additive in that part of the product (Claim 1). For the purposes of that invention, the particular chemical identity of the additive is not important (page 1, lines 37 and 38). This method ensures a more homogeneous distribution of the additive and, thereby, an optimal effect of the additive, e.g. an optimal stabilization of the polymer (page 1, lines 9 to 34). It is particularly suitable for the stabilization of polyolefins, especially polyethylene and polypropylene (page 3, lines 8 to 13; Examples 1 to 3 and 8).

3.3 D8 describes a stabilized polymer composition comprising a polymer, in particular a polyolefin, and a mixture of a triaryl phosphite and a hindered phenolic antioxidant (Claim 1 in conjunction with column 1, lines 7 to 10). The phosphites defined as suitable for such applications are said to be usually crystallized solids and particular stable against hydrolysis

(column 2, lines 9 to 15). The importance of the latter property for storage stability and stabilization effectiveness also appears in the passage column 1, lines 22 to 30.

- 3.4 During the oral proceedings the Appellant, relying on T 606/89 of 29 January 1993 (not published in OJ EPO), argued that D1 required the minimum of structural and functional modifications and should, therefore, be regarded as the closest state of the art.

The Board cannot follow that reasoning. The normal practice of the problem and solution approach requires, first, to consider whether a given teaching is directed to the same purpose or effect as the invention, and only subsequently to examine the compositional differences. It is sufficient to refer to the Case Law of the Boards of Appeal of the European Patent Office, Third Edition 1998, page 111 (English version; chapter D. Inventive step, 3.1 Determination of closest prior art - general), where numerous decisions are quoted which all specify that a document cannot qualify as the closest prior art to an invention merely because of similarity in the composition of the products, but that a prerequisite therefor is that its suitability for the desired purpose has also been described.

4. The patent in suit concerns a solid stabilizer composition for organic polymers, and process for preparing it.
- 4.1 From the above considerations and in accordance with the approach followed in the decision under appeal, D8 is to be regarded as representing the closest state of

the art. In view of the shortcomings of the known phosphite stabilizer compositions reported in the introduction of the patent specification, the technical problem underlying the patent in suit may be seen in the provision of a stabilizer composition less susceptible to hydrolysis.

4.2 According to the patent in suit this problem is to be solved by a stabilizing composition comprising a continuous dispersant phase consisting of amorphous TPM and a dispersed solid phase consisting of a specific phosphite or phosphonite, as indicated in Claim 1.

4.3 The question whether this particular physical state provides an effective solution of the technical problem gave rise to lengthy discussions during oral proceedings.

4.3.1 As the arguments of the parties made clear, in spite of numerous experimental reports there is no test on file which can be regarded as a fair comparison between a known composition and a claimed composition, because of differences in the compositions and/or the methods of measurement, so that no conclusion can be drawn. Although in such situations, where the parties make contrary assertions regarding specific aspects essential for the issue of patentability and the European Patent Office is unable to establish the facts on its own motion, the patent proprietor is given the benefit of the doubt following the principle laid down in the decision T 219/83 (OJ EPO 7/1986, 211-226), in the present case another consideration should also be made.

The question whether the technical problem is effectively solved boils down to the question whether phosph(on)ites dispersed as a solid phase in a continuous phase of a particular phenol are more resistant to hydrolysis than phosph(on)ites simply admixed to the same phenol. In the Board's view, such encapsulation is most likely to have a beneficial effect on hydrolysis stability and, accordingly, the Respondent's argument must be regarded as more plausible than the Appellant's assertion.

- 4.3.2 The question of the improved resistance to hydrolysis was also raised in connection with the process claims, which according to the Appellant did not correspond to the method described in the examples and for which, consequently, there was no evidence that the desired improvement was actually obtained.

As explained by the Respondent, which did not dispute that there is a discrepancy in the temperatures between the examples and the process claims, even if the examples should be regarded as illustrating the optimal embodiment, the somewhat lower range of temperatures required in the process claims is adequate to achieve satisfactory results in terms of resistance to hydrolysis.

4.3.3 A further point discussed was whether the class of phosph(on)ites defined by the radicals R, R₁, R₂ and R₃ corresponded to compounds which would all be suitable for the purpose of an improved resistance to hydrolysis.

From the wording of the claims it is self-evident that these general formulae should be considered in combination with the requirement concerning the melting points. Thus, should a particular phosph(on)ite fall under the general formulae without satisfying the melting point condition, it would be unsuitable for the achievement of the desired effect, thus outside the scope of the claims. This correlation between technical effect and interpretation of general formulae corresponds to a functional definition of the stabilizer which ensures that in any case the technical problem is effectively solved.

4.3.4 For these reasons the Board concludes that the combination of features required in the composition claims as well as in the process claims provides an effective solution of the above defined technical problem.

5. It remains to be decided whether this solution was obvious to a person skilled in the art having regard to the state of the art relied upon by the Appellant.

5.1 As indicated above (point 3.3), D8 relates, first, to stabilization systems based on triaryl phosphites, which comply with the first of the three general structural formulae in Claim 1 of the patent in suit (column 2, lines 28 to 37), in combination with phenols

such as TPM (Claim 12) and, secondly, to the importance of the stability of the phenol against hydrolysis with respect to storage stability and stabilization effectiveness. The document does not, however, disclose a solid dispersion of dispersed amorphous or crystalline phosphite in a continuous phase of the amorphous phenol component. On the contrary, the methods described as suitable to incorporate the additives into the polymers (column 4, lines 1 to 8), either by dry mixing of the polymer with the phosphite stabilizer and a phenolic antioxidant, and subsequently processing in an appropriate mixing device, or by applying a solution or a dispersion of the additives to the polymer, with the solvent being subsequently evaporated off, would not provide an incentive to consider a stabilizing composition comprising a continuous phase of one stabilizer and a dispersed phase of the other. For this reason, D8 cannot by itself render obvious the technical concept underlying the claimed stabilizing composition.

- 5.2 D1 (see point 3.2) deals with the problem of continuously determining by simple and reliable means the uniform distribution of additives in the desired, usually low amounts in a polymer. Both insufficient and excessive amounts of the additives adversely affect the polymer qualities (page 1, lines 15 to 28). This problem is solved by preparing a cohesive blend of at least one additive with an optical indicator (page 3, lines 5 to 7). In order to obtain a uniform mixture of the two components two different processes are disclosed: either melt-blending or dissolving one or more of the components in a solvent and removing the solvent by evaporation after thorough mixing of the

dissolved components and any undissolved component (page 2, lines 19 to 62). The question of hydrolysis of the phosph(on)ites is not addressed in the document at all.

Example 1, wherein a specific phosphonite is melt-blended with TPM and an optical brightener, was specifically referred to by the Appellant. The formula of the phosphonite corresponds to tetrakis(2,4-di-tert.-butylphenyl)-4,4-biphenylene di-phosphonite, mentioned at line 14 on page 7 of the patent in suit.

During oral proceedings, it was not disputed by the parties that the melting point of tetrakis(2,4-di-tert.-butylphenyl)-4,4-biphenylene di-phosphonite *per se* is at least about 180°C. This being in clear contradiction to the melting point of 82 to 87°C disclosed in Example 1 (page 4, line 5), the Respondent assumed that the phosphonite used in the example was a commercial mixture containing the above substance amongst other components. This assumption would find some support in the fact that not a specific temperature is mentioned, but a relatively broad range of temperature. In any case, the melting point of the component of the example is below 100°C, as required in Claim 1.

Moreover, in Example 1 the phosphonite was melted in a first step before TPM was added, and the resulting mixture was heated to 117 to 125°C to melt TPM. After addition and homogeneous dispersion of the indicator component, the melt was allowed to cool down to 85°C before it was poured into a shallow pan and allowed to solidify. This temperature profile does not comply with

the requirements in the process claims of the patent in suit either.

As noted by the Respondent (Counterstatement of Appeal, page 6, paragraphs 2 to 5), this specific embodiment differs from the method used in the patent in suit not only in the additional presence of an optical brightener, but also in the phosphonite used and in the structure of the resulting blend. In view of the relative values of the melting points of the phosphonite stabilizer and the phenolic antioxidant, it is the molten phosphonite component which forms the continuous phase, not the phenolic compound as required in the patent in suit. Thus, even if the skilled person were to consider a dispersion as a suitable structure for a combination of phosphonite and phenolic compound, there would be no incentive to consider the reverse dispersion or a phase inversion for the solution of the above defined problem.

5.3 D5 addresses the problem of finding easy, reliable and fast quality control methods which allows to obtain a good picture of uniformity of quality of the polymer purchased. These analytical methods should be fast enough to allow the level of stabilizer actually getting into the polymer to be corrected during the production run (page 1 to page 2, paragraph 1).

5.3.1 The disclosure of this document goes beyond the teaching of D1 in that it mentions, besides the equipment and the human factor, both the flow properties and distributive properties of an additive as having an influence on its uniform distribution in the polymer. The flow properties of an additive are

affected by bulk density, particle size and shape, hygroscopic nature and hydrolytic stability. The additive's melting point is mentioned as a factor affecting the distributive properties (page 4, paragraph 2 to page 5, paragraph 1).

In order to achieve that all the additives be admixed to the polymer in the desired ratios and, thereby, to overcome the above problems related to the flow properties, it is suggested to control the uniformity of the stabilizer distribution in the formulation by incorporating a brightener in the form of a stabilizer/brightener (indicator) blend, the latter being a free-flowing powder generated by a melt mixing process (page 5, paragraph 2 to page 7, paragraph 1).

- 5.3.2 Experiments are disclosed on pages 7 to 9 wherein Irganox 1010 (TPM, not disputed by the parties), Sandostab P-EPQ and a fluorescent brightener ("quantitative tracer of the antioxidants", i.e. an indicator) were blended into a polymer according to three different methods: (a) dissolving the additives in a solvent, slurring the solutions into the polymer and evaporating the solvent; (b) tumble-blending the additives to form a masterbatch which was then homogeneously mixed into the polymer; or (c) melt-mixing the three additives, followed by cooling and grinding, then tumble-blending this homogeneous blend of the additives with the polymer. The results show that "as the method of dispersing the antioxidants changed from the 'ideal' solvent slurry to a melt mixed blend, to a tumble blend of additives, the uniformity of dispersion decreased and the variation in melt flow rate increased, as demonstrated by the increasing

relative standard deviations.". Similar results were found when the effect of uniformity of antioxidant dispersion on polymer stability was tested in multiple extrusion stability tests.

It was not disputed by the parties that Sandostab P-EPQ, the composition of which is not identified in D5, is a mixture of four different compounds including the phosphonite according to the formula disclosed in D1. According to page 4 of the letter of opposition of Opponent II (23 August 1993), this mixture has a melt range of 85 to 110°C.

- 5.3.3 In the absence of further information the physical state of the additive blend cannot be inferred from any of the methods used; thus, even if the additional presence of the optical brightener is left out of account, there is no reason to assume that the phenolic antioxidant is present as the continuous phase and the phosphonite stabilizer as discrete particles.
- 5.3.4 Hence, this citation cannot provide any incentive to consider a composition within the terms of Claim 1 of the patent in suit to improve the stability against hydrolysis.
- 5.4 D10 discloses pentaerythrol-spiro-bis-phosphite compositions having improved hydrolytic stability. These phosphites show a high intrinsic tendency to hydrolyse (page 3, lines 1 to 8). Attempts had therefore been made to reduce this tendency by admixing thereto heterocyclic alkyl nitrogen compounds, aromatic heterocyclic nitrogen compounds, di- and trialkanol amines, ammonia and alkyl amines, but the properties of

resulting compositions were not entirely satisfactory (page 3, line 9 to page 5, line 9). It has then been found that long-chain aliphatic amines do not only improve the resistance of the phosphites against hydrolysis, but are also readily formulated therewith to form non-sticky solid particulate compositions which can be readily blended with polymers (page 5, lines 10 to 17). The compositions thus obtained can be used as sole stabilizer or in multicomponent stabilizer systems including e.g. phenolic antioxidants (Claim 8) e.g. for polyolefins (Claim 10).

These stabilizing compositions can be prepared by blending the phosphite and the amine in any convenient manner. When the phosphite has a relatively low melting point, the amine is suitably mixed into the melt before allowing the composition to solidify; when the phosphite has a higher melting point, it is blended with the amine by means of a mutual solvent. Alternatively, the particulate phosphite can be tumbled or agitated with the amine in molten or particulate form (page 8, line 17 to page 9, line 3). Complete homogenization of the phosphite and amine composition is not essential, but concentration of the amine at or near the surface of the phosphite particles, as in coating or encapsulation, is desirable because it maximizes the effectiveness of the amine when used in relatively low amounts (page 9, lines 4 to 9).

This teaching cannot lead to the claimed subject-matter for two reasons. The first is that encapsulation is regarded as an advantageous method only when the relative amount of the amine is low and that there is no disclosure of the physical features of a dispersion

as defined in the patent in suit, wherein the two components must satisfy specific conditions in terms of melting points. The second reason is, as explained in the introduction of the patent specification (page 2, lines 21 to 23), that the amines act by buffering the acidity which is released during the hydrolysis, which is a chemical mechanism; in the patent in suit, by contrast, stabilization is achieved by a different concept.

5.5 Even a combination of these various teachings would not provide an incentive to consider a dispersion as defined in the patent in suit for the solution of the technical problem. The main reason is that the authors of the various documents failed to recognize the advantages of encapsulation in general and, consequently, to identify the relative melting points of its components as critical parameters of the dispersion.

5.6 It follows that the documents relied upon by the Appellant, whether considered in isolation or in combination, do not render obvious the stabilizing composition according to Claim 1 which, therefore, involves an inventive step.

6. The secondary indicia considered in conclusion of the discussion of inventive step during oral proceedings, namely satisfaction of a long-felt need, time factor and simplicity of the solution, support the above finding.

6.1 As explained by the Respondent, the use of phosph(on)ites as stabilizers in polyolefin

compositions was known long before the priority date of the patent in suit and so was their susceptibility to hydrolysis. The numerous attempts to deal with this deficiency reported in the patent in suit and in the prior art relied upon by the Appellant show that many solutions involving phosphites had been envisaged - use of organic bases which buffer the acidity released during hydrolysis, use of specific stabilizer combinations, use of phosphites symmetrically substituted, optimized distribution of the additives in the polyolefins - but none of them could be regarded as really satisfactory. Given the many applications and the industrial importance of the polymers, it is thus legitimate to regard the question of the stabilization of phosphites against hydrolysis as a long-felt need (cf. T 109/82, OJ EPO 1984, 473).

- 6.2 The seven years which elapsed between the date of publication of the most relevant documents (D1: 30 January 1980; D8: 5 February 1980) and the priority date of the patent in suit (13 February 1987) are thus, in the Board's view, highly significant and must be considered as an indication in support of inventive step (cf. T 79/82 of 6 October 1983 and T 295/94 of 26 July 1994, both unpublished in OJ EPO).

The opposite argument presented by the Appellant, that the necessity to stabilize phosphites against hydrolysis did only arise shortly before the priority date of the patent in suit and that the solution as claimed was self-evident as soon as the necessity arose, is not acceptable because it contradicts the evidence on file.

- 6.3 The solution in the patent in suit is based on the encapsulation of one stabilizer by the other stabilizer. Even if encapsulation is a well known method to prevent the reactivity of a chemical compound and, thereby, to ensure its integrity, the Appellant has not provided any evidence that at the priority date a skilled person would have extended such a simple concept to a known combination of stabilizers. In the Board's view, this simplicity also speaks in favour of an inventive step (cf. T 106/84, OJ EPO 1985, 132; T 229/85, OJ EPO 1987, 237; and T 9/86, OJ EPO 1988, 12).
- 6.4 Claim 1 of the first set of claims being allowable, the same applies to Claims 2 to 7 of this set, which relate to preferred embodiments of the composition according to Claim 1, to the use Claim 11 of the first set and to the process Claims of both sets, whose patentability is supported by that of the main composition claim.
7. As the Respondent's main request is successful, its auxiliary requests need not be considered.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

C. Gérardin