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D E C I S I O N
of 11 May 2004

Case Number: T 0326/02 - 3.3.3

Application Number: 90312751.2

Publication Number: 0429311

IPC: C08K 3/08

Language of the proceedings: EN

Title of invention:
Polyester bottles

Patentee:
E.I. DU PONT DE NEMOURS AND COMPANY

Opponents:
The Dow Chemical Company
EASTMAN CHEMICAL COMPANY
Shell Internationale Research Maatschappij B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 83, 84, 100(a), 100(b), 123(2), 123(3)

Keyword:
"Extension of scope of protection (main request) - yes"
"Clarity (auxiliary request) - yes"
"Sufficiency of disclosure - yes"
"Novelty - yes"

Decisions cited:
G 0002/88, G 0010/91, G 0001/92, T 0301/87, T 0572/88, T 0182/89, T 0279/93, T 0892/94, T 0190/99, T 0355/99, T 0943/00

Catchword:
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Case Number: T 0326/02 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 11 May 2204

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office dated 22 November 2001 and posted 18 December 2001 revoking European patent No. 0429311 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: R. Young
Members: C. Idez
E. Dufrasne

Summary of Facts and Submissions

I. The grant of the European patent No. 0 429 311 in the name of Imperial Chemical Industries PLC (later E. I Du Pont De Nemours and Company) in respect of European patent application No. 90 312 751.2, filed on 22 November 1990 and claiming priority of the GB patent application No 8926631 filed on 24 November 1989 was announced on 14 January 1998 (Bulletin 1998/03) on the basis of 41 claims.

Independent Claims 1, 5, 8, 12, 14, 16, 21, 23, 27, 29, 34, 39, and 40 read as follows:

"1. A bottle having walls which are made of a thermoplastic polymer which contains metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles.

5. A bottle having walls which are made of a polyethylene terephthalate polymer which contains particles of metallic antimony which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 100 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles.

8. A bottle preform having walls which are made of a thermoplastic polymer which contains metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles.

12. A bottle preform having walls which are made of a polyethylene terephthalate polymer which contains particles of metallic antimony which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 100 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles.

14. A method of making a bottle as claimed in claim 1 which method comprises (a) incorporating into a thermoplastic polymer fine particles of a reducible metal compound and a reducing agent capable of reducing the metal compound to the metal and reacting the metal compound with the reducing agent to generate the fine particles of metal and (b) forming a bottle from the resulting polymer.

16. A method of making a bottle preform as claimed in claim 8 which method comprises incorporating into a thermoplastic polymer fine particles of a reducible

metal compound and a reducing agent capable of reducing the metal compound to the metal and reacting the metal compound with the reducing agent to generate the fine particles of metal and forming a bottle preform from the resulting polymer.

21. A method of making a bottle preform from a polymer composition comprising a thermoplastic polymer which contains metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles, which method comprises the steps of (1) incorporating into a thermoplastic polymer fine particles of a reducible metal compound and a reducing agent capable of reducing the metal compound to the metal and reacting the metal compound with the reducing agent to generate the metal particles, and (2) injection moulding the bottle preform from the polymer composition.

23. A method of making a bottle preform from a polymer composition comprising a polyethylene terephthalate polymer which contains particles of metallic antimony which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles of metallic antimony being present in an amount of from 10 to 100 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the

particles, which method comprises the steps of (1) incorporating into a polyethylene terephthalate polymer fine particles of a reducible antimony compound and a reducing agent capable of reducing the antimony compound to antimony and reacting the antimony compound with the reducing agent to generate the particles of metallic antimony, and (2) injection moulding the bottle preform from the polymer composition.

27. A method of making a bottle from a polymer composition comprising a thermoplastic polymer which contains metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles, which method comprises the steps of (1) incorporating into a thermoplastic polymer fine particles of a reducible metal compound and a reducing agent capable of reducing the metal compound to the metal and reacting the metal compound with the reducing agent to generate the metal particles, (2) injection moulding a bottle preform from the polymer composition, and (3) subjecting the bottle preform to reheating and blow moulding a bottle from the reheated preform.

29. A method of making a bottle from a polymer composition comprising a polyethylene terephthalate polymer which contains particles of metallic antimony which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles

of metallic antimony being present in an amount of from 10 to 100 ppm based on the weight of the polymer such that the reheat time of the polymer is less than the reheat time of the polymer in the absence of the particles, which method comprises the steps of (1) incorporating into a polyethylene terephthalate polymer fine particles of a reducible antimony compound and a reducing agent capable of reducing the antimony compound to antimony and reacting the antimony compound with the reducing agent to generate the particles of metallic antimony, (2) injection moulding a bottle preform from the polymer composition, and (3) subjecting the bottle preform to reheating and blow moulding a bottle from the reheated preform.

34. A thermoplastic polyester suitable for the manufacture of blow moulded bottles which has been made by a process including a solid state polymerisation step said polyester containing metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polyester such that the reheat time of the polyester is less than the reheat time of the polyester in the absence of the particles.

39. The use of metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, in a thermoplastic polyester suitable for the manufacture of blow moulded bottles, the metal particles being present in an amount of from 10 to 300 ppm by weight based on the weight of the

polyester to reduce the reheat time of the polyester relative to that of a polyester not containing the metal particles.

40. A method of making a thermoplastic polyester containing metal particles as claimed in any one of claims 34 to 38 which method comprises (a) incorporating into a thermoplastic polyester fine particles of a reducible metal compound and a reducing agent capable of reducing the metal compound to the metal and reacting the metal compound with the reducing agent to generate the metal particles."

The remaining claims were dependent claims.

II. Four Notices of Opposition were filed against the patent, as follows:

(i) by The Dow Chemical Company (Opponent I), on 12 October 1998, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and of Article 100(b) EPC,

(ii) by Eastman Chemical Company (Opponent II), on 13 October 1998 on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and of Article 100(b) EPC,

(iii) by Hoechst Trevira GmbH & Co. KG (Opponent III), on 14 October 1998 on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and of Article 100(b) EPC, and

(iv) by Shell Internationale Research Maatschappij B.V. (Opponent IV), on 14 October 1998, on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC).

The objections were supported *inter alia* by the following documents:

E1: EP-B1-0 061 414;

E2: US-A-4 499 226;

E4: US-A-4 408 004;

E5: US-A-3 497 477;

E17: CLEARTUF® Polyester Resins, Price List, March 1 1989;

E18: CLEARTUF PET packaging Resins Technical Information;

E19: Letter of Mr D. D. Callander to Dr T. Tokuzumi of Mitsui Petrochemical Industries Ltd, dated June 3, 1977;

E20: Letter of Mr L. K. Hunt of the Goodyear Tire & Rubber Company to Mr R.L. Denick of Continental Plastics Containers, dated September 2, 1981;

E21: Advance Tech-Data Sheet concerning CLEARTUF 7202C PET Resin, dated 8/87; and

E22: Information concerning the synthesis of CLEARTUF 7202 and 8006.

III. By a decision announced orally on 21 November 2001, and issued in writing on 18 December 2001, the Opposition Division revoked the patent.

The decision was based on Claims 1 to 5 submitted as main request at the oral proceedings of 21 November 2001.

Independent Claim 1 read as follows:

"Use in a bottle preform having walls which are made of a thermoplastic polymer, of metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in an amount of from 10 to 300 ppm based on the weight of the polymer, to reduce the reheat time of the polymer relative to the reheat time of the polymer in the absence of the particles".

Claims 2 to 5 were dependent claims.

In its decision, the Opposition Division held that the patent in suit disclosed the invention in a manner sufficiently clear and complete for it to be carried out by the skilled person, but revoked the patent on the grounds that it did not meet the requirements of Article 54 EPC.

The decision stated that the claims were directed to the use of certain metal particles in a bottle preform

of a thermoplastic polymer in order to reduce the reheat time. Reference was thus made to the decisions G 2/88 (OJ EPO, 1990, 093) and T 279/93 of 12 December 1996 (not published in OJ EPO).

According to the decision it had been shown by the Opponents (cf. documents E17, E18, E19, E20, E21, and E22) that, before the priority date of the patent in suit, a commercially available polyester i.e. CLEARTUF 7202 which contained metal particles as required in Claim 1 of the patent in suit had been used in the manufacture of bottles by the preform process. According to the decision this had not been contested by the Patentee. It was further known from document E4 (cf. Table II) that a preform made of CLEARTUF 7202 had a shorter reheat time than a preform made of a "high clarity polyester" which apparently contained no or almost no metal particle. Thus, the claimed technical effect (i.e. a reduced reheat time) was not new. The decision stated that E4 did not disclose the cause of this effect. However, finding out the reason for said improvement could not establish the novelty since this effect was not linked with a new physical activity or type of use. Thus, the Opposition Division came to the conclusion that the subject-matter of Claims 1 to 5 was not new in view of E4 and the commercially available product CLEARTUF 7202.

IV. A Notice of Appeal was filed on 21 February 2002 by the Appellant (Patent Proprietor) with simultaneous payment of the prescribed fee. With the Statement of Grounds of Appeal filed on 26 April 2002, the Appellant submitted a set of 5 claims as main request. This set of claims

corresponded to the set of claims on which the decision of the Opposition Division has been based.

The Appellant also argued essentially as follows:

(i) There was no prior art which taught the use of metal particles to reduce the reheat time of a bottle preform. Furthermore, the prior art taught that the presence of metal particles should be avoided (cf. document E5).

(ii) It had not been demonstrated that there was any publicly available document disclosing the antimony content of CLEARTUF 7202. The public availability of document E22 had not been substantiated. Furthermore, there was no explicit reference in E4 to the antimony content of the high clarity polyester.

(iii) The Opposition Division had misconstrued the principles of decision G 2/88.

(iv) In the present case the new use was the use of metal particles to attain the technical effect of the reduction of reheat time.

(v) Thus, the functional technical feature was the attaining of such a technical effect and not merely the technical effect.

(vi) Since there was no reference in document E4 to the use of metal particles, there was no disclosure in E4 that the attainment of the

technical effect of a reduction of reheat time could be achieved by the use of metal particles.

(vii) Thus, the functional technical feature of Claim 1 had not been previously disclosed.

(viii) Even if it might be true that the skilled person could have ascertained the antimony level in CLEARTUF 7202 and in the high clarity polymer, there was no disclosure in E4 which attributed the difference in "80-second Heat-up temperatures" to the presence or absence of metal particles.

(ix) Furthermore, there was no evidence that the only difference between the two polyester compositions of Table II of E4 was the amount of metal particles.

(x) The Opposition Division had reached its conclusion by interpreting the results of E4 with the benefit of the knowledge disclosed in the patent in suit.

(xi) Furthermore decision G 2/88 was concerned with the novelty of a "second" use of compound which had already be proposed for a first use. It was however clear that the prior art did not disclose any use of the metal particles.

(xii) Independently of the fact that the reference to the decision T 279/93 in the decision announced by the Opposition Division at the oral proceedings might amount to a procedural irregularity, since it was not discussed during

the oral proceedings, this decision was not relevant in the present case. In T 279/93 the new use was the same as the old use.

(xiii) In contrast, the invention of the patent in suit was not concerned with a mere discovery associated with the simple repetition of a use disclosed in the prior art since there was no such use disclosed in the prior art.

(xiv) Furthermore, the Opposition Division had overlooked the fact that factors other than the difference in the content of antimony, might be responsible for the difference in 80-second Heat-up temperature. Factors such as the haze of the preform, the amount of colorant, and the amount of sodium or sodium acetate in the polyesters might influence the reheat time.

V. The arguments presented by the Respondents (Opponents I, III, and IV) in the written procedure may be summarized as follows:

(i) Claim 1 of the main request did not meet the requirements of Article 123(2) EPC since the original application did not disclose bottle preforms having walls made of a thermoplastic polymer.

(ii) The claims did not meet the requirements of Article 84 EPC for the following reasons:

(ii.1) The features "sufficiently fine for them not to be visible to the eye", and "intrinsically absorbed radiation" were unclear.

(ii.2) The feature "reheat time" was not associated with any precise meaning. This rendered the claims unclear.

(ii.3) Polyesters absolutely free of metal particles were not available, so that the comparison addressed in Claim 1 could not be effected. Furthermore, the reheat time might be influenced by other factors. Thus, the comparison would be meaningless unless all other factors were not specified.

(iii) Concerning novelty:

(iii.1) CLEARTUF 7202 was clearly publicly available before the priority date. Its composition formed therefore part of the state of the art (cf. decision G 1/92, OJ EPO, 1993, 277)). It was further known to use resins containing reduced antimony for making bottles by using a reheat preform process (cf. E4).

(iii.2) The use of the metal particles according to Claim 1 related to a specific aspect of the use of antimony particles in a bottle preform but did not differ from the known use.

(iii.3) E4 disclosed the technical effect of a reduced reheat time linked with the use of CLEARTUF 7202 in a bottle preform. Consequently the

technical effect was not new. Discovering the cause of a known effect was merely a discovery, in particular if it was not linked with any new physical activity resulting from this discovery.

(iii.4) The data points in Table II of E4 concerning CLEARTUF 7202 and the high clarity polyester could only be interpreted such that there was a link between the reheat time and the presence of antimony particles. In that respect it was evident that the antimony catalyst used in the manufacture of the high clarity polyester had been converted to antimony glycolate, so that no metal particles were present.

(iii.5) Contrary to the submissions of the Appellant, decision T 279/93 was relevant, since the physical activity of metal particles to reduce the reheat time was an old known use. In that respect, the claimed use merely provided an explanation for an old use or effect.

(iii.6) The Appellant had speculated that the shorter reheat time of CLEARTUF 7202 might be related to other factors (e.g. haze, colorant) than the presence of antimony particles. In that respect the improved reheat time of the inventive example submitted with letter of 17 October 2000 could also be based on the greyer and hazier resin.

(iii.7) E4 clearly taught to use infrared absorbent materials to reduce the reheat time. It was

also evident that the absorbent material of CLEARTUF 7202 was the antimony particles.

(iii.8) Documents E1 and E2 would also be novelty destroying.

VI. With its letter dated 2 February 2004, Opponent III withdrew its opposition. With its letter dated 8 March 2004 Opponent I (Respondent I) informed the Board that it would not attend the oral proceedings scheduled on 11 May 2004.

VII. Oral proceedings were held on 11 May 2004 in the absence of Respondent I.

At the oral proceedings the Respondents while maintaining their objections concerning the formal allowability of the main request filed by the Appellant with the Statement of Grounds of Appeal (cf. points V(i) to V(ii.3) above), further submitted that Claim 1 extended beyond the scope of granted Claim 8, since the language of Claim 1 encompassed now the possibility of the metal particles to be present, for example, in a coating layer of the preform, while Claim 8 required that the particles be comprised in the thermoplastic polymer.

In that respect, the Appellant argued that Claim 1 was based on Claim 8 as granted. The language of Claim 1, which related to the use of metal particles in a bottle preform made of thermoplastic polymer could only be interpreted as implying that the particles were in the polymer. Reference was also made to the decision T 190/99 of 6 March 2001 (not published in OJ EPO). In

view of the objection under Article 123(2) EPC raised by the Respondent concerning the feature "having walls", the Appellant argued that this feature was present in the granted claims and indicated that it would not give its consent to the introduction of this new ground of opposition into the proceedings.

Following preliminary observations of the Board concerning the allowability of Claim 1 of the main request under Article 123 EPC, the Appellant submitted an auxiliary request referred to as auxiliary request I.

Claim 1 of the auxiliary request reads as follows:

"Use in a bottle preform having walls which are made of a thermoplastic polymer, of metal particles which are sufficiently fine for them not to be visible to the eye and which intrinsically absorb radiation in the wavelength region 500 nm to 2000 nm, the particles being present in the thermoplastic polymer in an amount of from 10 to 300 ppm based on the weight of the polymer, to reduce the reheat time of the polymer relative to the reheat time of the polymer in the absence of the particles".

Claims 2 to 5 are dependent claims.

The Respondents having stated that they no longer had objections under Article 123 EPC in view of the auxiliary request, the discussion essentially concentrated on issues concerning (i) the allowability of the claims of the first auxiliary request under Article 84 EPC, (ii) the sufficiency of disclosure of the patent in suit, and (iii) the assessment of novelty

of the subject-matter of the first auxiliary request in view of documents E4, E1 and E2.

(i) Concerning point (i)

(i.1) The Appellant essentially argued that the wordings objected to (cf. point V(ii.1) to V(ii.3)) above) were present in granted Claim 8. Thus, the alleged lack of clarity did not arise from the amendments made in the course of the opposition and appeal procedure.

(i.2) The Respondents, on the contrary, argued that the change of category of claims from a product claim (granted Claim 8) to a use claim amounted to a totally newly formulated claim which should be checked as such for its compliance with Article 84 EPC.

(ii) Concerning point (ii):

Although the objection of lack of sufficiency of disclosure had not further been mentioned by the Respondents in the written appeal procedure, they submitted that this ground of opposition was present at the beginning of the opposition procedure and that the objections mentioned under Article 84 EPC (cf. points V(ii.1) to V(ii.3) gave rise to corresponding objections of insufficient disclosure under Art. 83 EPC.

The arguments presented by the Respondents may be summarized as follows:

(a) There was no standard method for determining as to whether the particles were visible to the eye or not. Furthermore, it was not indicated whether the particles should not visible as such, in the preform or in the moulded bottle. Thus, the skilled person would not know whether he was working inside or outside the scope of the claims.

(b) This deficiency was further aggravated by the fact that the size range of the particles was linked to their intrinsic infrared absorption (cf. patent in suit, page 3, lines 19 to 21).

(c) The patent in suit (cf. page 2, lines 13 to 14) only gave vague indications concerning the reheat time. The method indicated on page 4 lines 8 to 13 did not allow to determine this essential feature, since, according to this test, the reheat time was set up at 45 seconds.

(d) As acknowledged in the patent (cf. page 3, lines 42 to 43) polyesters inevitably contained residual amounts of metal particles. This implied that there was no polyester totally free of metal particles. Thus, the comparison mentioned in Claim 1 could not be effected.

(e) As shown by the Examples 1 and 2 of Table 1 of the patent in suit, there was no linear relation between the metal particles content and the reheat time. Thus, an extrapolation to a polyester having a metal particle content of zero was not possible.

(f) The reheat time could be influenced by other factors such as the haze or the crystallization state of the polyester. The comparison would be meaningless unless these other factors were maintained the same. In that respect, it was evident from Table I of the patent in suit, that not only the metal particles content had been changed but also the haze and the content of phosphite which might influence the nucleation and thus the crystallization state of the polyester.

The arguments presented by the Appellant in response to the submissions of the Respondents concerning the objection of insufficiency of disclosure may be summarized as follows:

(1) The skilled person would have no difficulty, using the resolving power of the human eye, to determine whether the particles were visible to the eye in situ (i.e. in the preform) or not.

(2) The same was true for the upper limit of the range of the particle size, i.e. the upper limit at which the particles were still not visible to the eye. The skilled person would also know how to determine whether the metal particles intrinsically absorbed in the wavelength region of 500 to 2000 nm.

(3) The reheat time was a well known feature in the blow moulding of preforms. Precise indications of the starting temperature and the end-temperature were not necessary, since it was the relative

values of the reheat time under the same conditions which were essential.

(4) Even if the patent in suit did not expressly refer to an extrapolation method for assessing the reheat time of the polymer totally free of metal particles, such extrapolation method belonged to the normal practice of the skilled artisan.

(5) The examples of Table I of the patent in suit had been carried out using polyesters made under the same manufacturing conditions. The phosphorus compound had a marginal contribution to the reheat time. Thus, the variation of the reheat time was directly linked to the content of metal particles.

(iii) Concerning novelty:

Following preliminary considerations of the Board concerning the passage of the decision under appeal according to which the Patentee had not contested that CLEARTUF 7202 was available prior to the priority date and contained metal particles within the requirements of Claim 1, the Appellant indicated that it did not contest either the availability of CLEARTUF 7202 prior to the priority date or the fact that this polyester might contain antimony particles in the amount required by Claim 1, but it submitted, firstly, that document E22 was not publicly available before the priority date, and, secondly, that there was no analytical method at the disposal of the skilled person in order to allow him to determine as to whether the antimony particles in the polyester CLEARTUF 7202 were indeed in the oxidation state 0, i.e. in the metallic state.

In that respect the Respondents argued that the composition of the polyester CLEARTUF 7202 formed part of the prior art, since this product was publicly available before the priority date of the patent in suit. Reference was made to the decision G 1/92 of the Enlarged Board of Appeal. Furthermore, the oxidation state of the antimony might be determined by analytical method such as X-ray crystallography. The Respondents submitted that, if, at such a late stage of the proceedings, the Appellant intended to challenge the analyzability of CLEARTUF 7202, and if the Board would be inclined to consider this argument, they would request an adjournment of the oral proceedings and the continuation in writing of the procedure in order to give them the opportunity to present counter-arguments on that point.

The Parties were informed that the Board considered, in absence of any evidence of the contrary from side of the Appellant, that the composition of CLEARTUF 7202 formed part of the part of the prior art.

The arguments presented by the Parties concerning the novelty of the claimed subject-matter may be summarized as follows:

(iii.1) By the Appellant:

(a) It was true that Table II of document E4 showed that CLEARTUF 7202 had a shorter reheat time than the high clarity polyester.

(b) Even if it could have been known that there was a difference in the content of metal particles between CLEARTUF 7202 and the high clarity polyester, it could not be ascertained that the metal particle content was the only difference between the CLEARTUF 7202 and the high clarity polyester, since neither the exact preparation conditions of the CLEARTUF 7202 used in Table I nor those of the high clarity polyester were known.

(c) There were other possible explanations for the difference in reheat time between these two polyester samples.

(d) This would imply that it could not be directly and unambiguously derived from document E4 that the reduction of the reheat time was attributable to the difference in metal particle content.

(e) Following the principles set out in decision G 2/88 the reducing of the reheat time by the use of the metal particles represented a technical feature of the claimed invention.

(f) Since this technical feature was not disclosed in E4, the subject-matter of Claim 1 was novel over E4.

(g) Documents E1 and E2 could not challenge the novelty of the claimed subject-matter, since they did not refer to the reheat time of the polyesters disclosed therein.

(iii.2) By the Respondents:

(a) The aim of E4 was to obtain polyester preforms having a high clarity and a short reheat time. According to E4, this problem could be solved by adding an infra-red absorbent such as carbon black into a high clarity polyester. The high clarity polyester did not contain metal particles since as indicated in Table I of E4 the antimony trioxide had been converted into antimony glycolate.

(b) Table II of E4 showed that the reheat time of the carbon black modified high clarity polyester was comparable to that of CLEARTUF 7202, which was known, not to have a high clarity due to the presence of metal particles.

(c) Thus, it could be implicitly inferred from E4 that the metal particles gave the same effect on the reheat time as carbon black. Reference was also made to the decision T 892/94 (OJ EPO, 2000, 001).

(d) Determining the reheat time of preform was a necessity in the blow moulding process. Thus, the skilled person would inevitably have seen that the reheat time of CLEARTUF 7202 was shorter.

(e) There was no new utility of the metal particles according to Claim 1 of the patent in suit since the technical effect relied on by the Appellant was inevitably attained when using CLEARTUF 7202 in a blow moulding process.

(f) The only difference with E4 resided in the mere explanation of the shorter reheat time.

(g) Documents E1 and E2 disclosed in their Table III of (cf. Sample 1 thereof)) a polyester comprising antimony metal particles as required in Claim 1 of the patent in suit.

(h) This polyester was used for making bottles by blow moulding using the preform process (cf. Table III of E1 and E2). Thus, the skilled would have inevitably observed that this specific polyester had a shorter reheat time than the other polyesters used in Table III and not containing metal particles.

VIII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 5 of the main request filed on April 26, 2002 or, in the alternative on the basis of the Claims 1 to 5 of auxiliary request I, filed at the oral proceedings, or that the case be remitted to the first instance for the examination of the inventive step.

The Respondents requested that the appeal be dismissed or that the case be remitted to the first instance for the examination of the inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural matters:*

As mentioned above in paragraph VI, Respondent I indicated with its letter dated 8 March 2004 that it would not be represented at the oral proceedings. In accordance with Rule 71(2)EPC, the proceedings continued without Respondent I.

Main request

3. Article 123(3) EPC

3.1 While the Appellant has argued that Claim 1 is based on a reformulation of granted product Claim 8 in a use claim, it is true as submitted by the Respondents (cf. point VII above), that Claim 1 further differs from granted Claim 8 by the feature that it relates to the **use of metal particles in a bottle preform** having walls made of a thermoplastic polymer, while Claim 8 as granted is directed to a **bottle preform** having walls which are made of a **thermoplastic polymer which contains the metal particles**.

3.2 It thus follows that the language of Claim 1 could be interpreted as implying that the particles are no longer restricted to be present in the thermoplastic polymer used for making the walls of the preform as required by granted Claim 8, but may be incorporated in other parts of the preform e.g. in a coating layer.

3.3 In the Board's view, such interpretation is not an interpretation that the skilled person would rule out, since it clearly makes technical sense (cf. T 190/99 mentioned above). Thus, the Board comes to the conclusion that the language of Claim 1 leads to an

extension of the protection conferred by the claims as granted, contrary to Article 123(3) EPC.

3.4 Consequently, the main request must be refused.

Auxiliary request I

4. Article 123(2) EPC

4.1 It is noted by the Board that an objection under Article 100(c) EPC has neither been raised against the granted patent by the Opponents, nor dealt with in the appealed decision.

4.2 Furthermore, as indicated above in paragraph VII, the Patentee (Appellant) has not given its approval for the introduction of this new ground of opposition.

4.3 This has as a consequence that the assessment of the allowability of Claim 1 under Article 123(2) must be limited to that of the amendments made during the opposition and/or opposition appeal proceedings (G 10/91 OJ EPO, 1993, 420).

4.4 In that context, it is evident that granted Claim 8 inherently related to the use of metal particles present in a thermoplastic polymer in an amount of from 10 to 300 ppm such that the reheat time is less than the reheat time of the polymer in the absence of the particles. Thus, Claim 1 of the auxiliary request results from a mere reformulation of product Claim 8 as granted in a use claim. Thus, Claim 1 is not open to objections under Article 123(2) EPC.

4.5 It further follows that no objection under Article 123(2) EPC can arise against dependent Claims 2 to 4 which derive from the reformulation in use claims of granted dependent Claims 9, 10, 11 respectively. Claim 5 is based on the reformulation of granted Claim 13, as use claim and further limited by the incorporation of the features set out on page 2, lines 34 to 36 of the published patent application.

5. *Article 123(3) EPC*

5.1 As indicated above, Claims 1 to 5 result from the reformulation of granted products Claims 8, 9, 10, 11 and 13, respectively, as use claims.

5.2 Following the principles set out in decision G 2/88 (cf. Headnote 2), the Board comes therefore to the conclusion that Claims 1 to 5 are not open to objectionunder Article 123(3) EPC.

6. *Article 84 EPC*

6.1 The Respondents have argued that, due to the amendments made in Claim 1, the clarity of this claim must be re-examined, and they have thus raised objections under Article 84 concerning several features in Claim 1 (cf. points V(ii.1) to V(ii.3), above).

6.2 When amendments are made to a patent during an opposition, Article 102(3) EPC requires consideration as to whether the amendments introduce any contravention of any requirement of the Convention, including Article 84 EPC. Article 102(3) EPC, however, does not allow objections to be based upon Article 84

EPC, if such objections do not arise out of the amendments made (cf. also decision T 301/87; OJ EPO, 1990, 335; Headnote 1).

6.3 In the present case, the Board notes that the features of Claim 1 to which objection has been raised under Article 84 EPC by the Respondents (cf. points V(ii.1) to V(ii.3), above) were already present in granted Claim 8.

6.4 In this connection, it is further evident that the mere reformulation of granted product Claim 8 into a use claim cannot generate a lack of clarity of these features in the context of Claim 1.

6.5 It thus follows that the raising of these objections under Article 84 EPC by the Respondents against Claim 1 cannot be allowed.

6.6 Since, in the Board's view, no objection under Article 84 EPC arises from the change of category *per se* of granted Claims 8, 9, 10, 11 and 13 into use Claims 1 to 5, the Board comes to the conclusion that the requirements of Article 84 EPC read in connection with Article 102(3) EPC are met by all the claims.

7. *Sufficiency of disclosure*

7.1 Claim 1 is to be construed as implying that is essential for the claimed use (i) that the metal particles should be sufficiently fine for them not be visible to the eye, (ii) that they intrinsically absorb radiation in the wavelength region of 500 to 2000 nm, and (iii) that a comparison between the reheat time of

the thermoplastic polymer containing the metal particles and that of the polymer in the absence of particles can be effected.

7.2 On that basis, it remains thus to be decided whether the patent specification provides sufficient information on these essential features in order to enable a person skilled in the art to carry out the invention.

7.2.1 Concerning feature (i):

(a) In that respect, the Respondents have argued that without the indication of a standard method for determining this essential feature, the skilled person would not know whether he is working according to Claim 1. This argument, however, is, in the Board's view, rather associated with the scope of the claim, i.e. Article 84 EPC, than with sufficiency of disclosure (cf. also T 943/00 of 31 July 2003, not published in OJ EPO, Reasons for the Decision, point 10.5.1).

(b) Furthermore, there can be no doubt that it will be immediately apparent to the skilled person whether or not the particles are visible to its eye in the preform, so that no lack of sufficiency in the sense of Article 83 EPC can arise in respect of this feature.

7.2.2 Concerning feature (ii):

(a) According to the patent in suit (cf. page 2, lines 17 to 19), the absorption in the polymer is

a combination of light scattering by suspended matter in the material and any intrinsic absorption of the suspended matter.

(b) This implies, in the Board's view, that the absorption relies on two different aspects of the particles, i.e. their size (scattering) and the material they are made of (intrinsic absorption).

(c) It thus follows, independently of the fact that the patent in suit gives several examples of suitable metals (cf. page 3, lines 14 to 16) to be used as a material for the particles, that the skilled person would have no difficulty in selecting an appropriate metal in view of its infrared absorption spectrum.

(d) It further follows in view of page 3, lines 19 to 21, read in combination with page 2, lines 17 to 19, that the skilled person would, without undue burden, select the appropriate particle size fulfilling both the criterion of not being visible to the eye and that of exhibiting the desired large absorption range due to light scattering.

7.2.3 Concerning feature (iii)

(a) Firstly, it cannot be contested that the person skilled in the art of manufacturing bottles by the preform process would know to what the reheat time in this technology refers, i.e. the time necessary to reheat the preform in order to attain the temperature at which it could be blow moulded.

(b) Secondly, while it is correct, as submitted by the Respondents, that the patent in suit does not precisely define the starting temperature ("usually at ambient temperature") or the temperature to be reached at the end of the reheat time ("about 100°C"), it should be kept in mind that it is not the duration of the reheat time as such which is at stake but that a meaningful comparison of the reheat times between a polymer comprising metal particles and the same polymer free of metal particles could be carried out.

(c) Consequently, the indication of the exact conditions of the determination of the reheat time is not the deciding factor for the issue of sufficiency, since the skilled person only needs to maintain the same conditions for the reheating of the preform in order to obtain a meaningful comparison.

(d) Thus, the question of sufficiency of disclosure in view of feature (iii) boils down to the question as to whether the skilled person could have had access to the reference used as basis in the comparison addressed in Claim 1, i.e. the polymer free of metallic particles.

(i) In this connection, it is clear from the description of the patent in suit (cf. page 3, lines 40 to 44) that polymers, e.g. polyesters, generally contain residual amounts of metal particles.

(ii) Nevertheless, even if a polymer totally free of metal particles could not be obtained, it would not represent an undue burden for the skilled person to prepare a series of polymers under the same conditions but differing essentially in their metal particles amount and exhibiting decreasing amounts thereof, to determine their reheat time under the same conditions, to quote the reheat time in relation to the metal content and then to extrapolate the reheat time at zero metal particles, in as much that such a method can be inferred from the patent in suit (cf. Examples 1 to 7, Table I).

(iii) In that respect the Respondents have questioned the validity of the relation between metal content and reheat time in view of the data in Table I of the patent in suit arguing that other factors, such the haze or the phosphorous content of the polymer have not been kept the same.

(iv) However, the Board observes that the Examples 1 to 7 have been prepared under the same conditions, and that, according to the Patentee the role of the phosphite component is marginal in the reheat process, so that a direct relation between metal particles content and reheat time can be derived. In any case, the issue raised by the Respondents, is an issue which would normally be decided in the light of relevant experimental evidence. No such evidence was

provided by the Respondents, however, which have the onus of the proof (cf. T 182/89, OJ EPO, 1991, 391).

7.3 Thus, for the reasons mentioned above in Section 7.2, the Board comes to the conclusion that it has not been shown to its satisfaction that there is a deficiency in the patent in suit contrary to Article 83 EPC. Consequently the ground of opposition under Article 100(b) EPC cannot succeed.

8. *Novelty*

8.1 Lack of novelty of the claimed subject-matter has been alleged by the Respondents in view of documents E4, E1 and E2.

8.1.1 Document E4 relates to a polyester composition which has high clarity, neutral hue and low haze values and contains very small amounts of an infrared absorbing material. According to E4, high clarity polyesters when subjected to a heating step in a light emitting oven (e.g. infrared radiation), exhibit excessive heating times. Thus, document E4 teaches to use specific types of materials in order to improve the heat-up rate of high clarity polyester resins utilized in light-emitting ovens. A preferred material is carbon black. Polyesters containing small amounts of carbon black therein can be utilized in any situation wherein the reheat or the heat-up time is desired to be shortened with regard to light from heat-emitting and infrared lighting sources. Specific areas of use of the polyester include situations wherein preforms exist

which then are heated to form a final product, for example, as in the use of parisons which are blow-moulded to form a bottle (column 3, line 22 to column 4, line 10).

8.1.2 A preferred high clarity polyester is made utilizing an antimony catalyst, a phosphorus compound, and a bluing agent. The antimony catalyst utilized in such a high clarity resin can be generally any trivalent organic antimony compound known to the art. The high clarity polyester is also made using relatively low amounts of a phosphorus compound, for example a phosphate or phosphoric acid, and a bluing agent (e.g. cobalt compounds). If a bluing agent is not utilized, the resulting polymer produced would generally not have the neutral hue in that it would have an undesirable yellowish tinge or colour. Since cobalt compounds have been shown to increase the acetaldehyde level in a container, an amount of a phosphate compound (including phosphoric acid) is utilized to suppress the catalytic activity of the cobalt compound. Should a greater amount be utilized, free phosphate will generally exist which will react with the antimony to produce an antimony phosphate type compound and, if sufficient amounts exist in excess of the solubility limit of such a compound, will form particles and/or nucleation of crystallinity upon formation of the polyester and results in a hazed article (column 4, line 51 to column 5, line 59).

8.1.3 In a specific example, document E4 (Table I) discloses the preparation of a high clarity poly(ethylene terephthalate) resin modified by the addition of finely divided carbon black. According to E4 polyesters having

different amounts of carbon black were prepared in a similar manner, including a high clarity control which had no carbon black therein at all. The polyesters were then made into preforms in a conventional manner. The preforms were heated in a quartz infrared heated oven for 80 seconds. Furthermore, a conventional polyester i.e. CLEARTUF 7202, made by Goodyear was utilized as a control (column 7, lines 45 to 55).

8.1.4 In that respect, it has been indicated in the decision under appeal, by reference to the documents E17 to E22, that the Opponents (Respondents) have demonstrated that CLEARTUF 7202 was commercially available before the priority date of the patent in suit and that this polyester contained metal particles within the requirements of Claim 1 of the patent in suit. Furthermore, the decision stated that this had not been contested by the Patentee (Appellant).

8.1.5 However, as mentioned above in point VII(iii), the Appellant, although indicating that it did not contest that the polyester CLEARTUF 7202 would have been available to the public before the priority date and that it contained antimony particles in the amount required by Claim 1, has questioned the public availability of E22 and the technical possibility of determining the oxidation state of the antimony particles in CLEARUF 7202.

8.1.6 In this connection, the Board is firstly of the opinion that it is not necessary for it to decide on the public availability of document E22, since all the Parties have agreed that CLEARTUF 7202 was commercially available before the priority date. Secondly, taking

into consideration that the late submission of the Appellant that the oxidation state of the antimony in CLEARTUF 7202 could not have been determined, has not been supported by any relevant evidence, the Board, having further regard to the fact that the Appellant has nevertheless conceded that CLEARTUF 7202 contained antimony in the required amount, can only consider, in accordance with the principles set out in decision G 1/92, that the composition of CLEARTUF 7202 and thus the oxidation state of the antimony therein were available to the public before the priority date of the patent in suit. While this consideration corresponds to the most favourable starting point for the Respondents for the assessment of novelty, this does not preclude, in the Board's view, the Parties from submitting during the further prosecution of the case (cf. point 9, below) evidence in order to show whether the oxidation state of the antimony in CLEARTUF 7202 could not (Appellant) or could (Respondents) have been determined.

8.1.7 In this context, it can be seen from Table II of E4 that CLEARTUF 7202 achieved a temperature of about 210.5°F after 80 second heat-up and that the high clarity polyester not containing carbon black only achieved 201°F, i.e. in other words that CLEARTUF 7202 exhibited a shorter reheat time than the high clarity polyester not containing carbon black. It is also apparent from Table II that small amounts of carbon black increased the temperature at the 80 second heat-up to that of the prior art non-high clarity preform (i.e. CLEARTUF 7202) and even above it, i.e. that the reheat time was reduced and, hence improved.

8.1.8 While it can therefore be concluded that document E4 discloses that CLEARTUF 7202, which on this basis (section 8.1.6,above) is regarded as containing metal antimony particles within the requirements of Claim 1, exhibits a reduced reheat time in comparison to the high clarity polyester of Table II, it has to be established in order to assess the novelty of the claimed subject matter over document E4:

(a) whether this high clarity polyester is free of metal particles or at least contains a lesser amount of metal particles than CLEARTUF 7202, and if so,

(b) whether there is a clear and unambiguous disclosure in document E4 according to which the reported reduction of the reheat time is linked to the difference in metal content.

8.1.9 Concerning the first question, it is evident that E4 is totally silent on the amount of metallic particles in the high clarity polyester. Furthermore, since the exact conditions of the preparation of the high clarity polyester are not disclosed in E4, it cannot be ascertained how much, if any, metal particles would be present in the high clarity polyester, so that it is highly questionable as to whether a valid comparison can be made.

8.1.10 Even if, for the sake of argument, one would consider that the high clarity polyester was substantially free of metal particles, it is noted by the Board, firstly, that there are several differences between the manufacture of the high clarity polyester and that of

CLEARTUF 7202, namely *inter alia* the presence of a cobalt compound and that of phosphoric acid (cf. also point 8.1.2 above), secondly, that E4 does not give any indication on the respective crystallinity, nucleation, and haze of either the high clarity polyester or the sample of CLEARTUF 7202 used in the example, and thirdly that any or all these different factors might have an influence on the reheat time of the respective preforms.

8.1.11 Consequently, document E4 does not disclose clearly and unambiguously that the shorter reheat time of CLEARTUF 7202 is due to the difference in metal particle content between CLEARTUF 7202 and the high clarity polyester, or, therefore, that there is a link between the metal particle content of the polyesters and their reheat time.

8.1.12 On this basis, and following the principles set out in decision G 2/88 (Reasons, point 9), the attaining of a reduction of the reheat time which underlies the use of the metal particles constitutes a technical feature of the claimed invention according to the patent in suit.

8.1.13 Since, as shown above, there is no clear and unmistakable teaching in E4 of this technical feature of the claimed invention, the subject-matter of Claim 1 and by the same token that of dependent Claims 2 to 5 must be considered as novel over E4 (cf. also T 355/99 of 30 July 2002; not published in OJ EPO, Reasons point 2.2.4).

8.1.14 This conclusion cannot be altered by the further arguments of the Respondents, in view of the decisions

T 892/94 and T 279/93, that the claimed use of the metal particles would represent at most a mere theory explaining the reduction of reheat time, since the circumstances of the present case totally differ from those underlying these decisions for the following reasons:

(a) In the decision T 892/94, the Board stated that the use of aromatic esters as active ingredients in a deodorant composition was already known in a prior art document. Thus, it considered that the ex post facto discovery that the deodorising effect of the aromatic esters when used as active ingredients in deodorant compositions might result from their capability of inhibiting esterase producing micro-organisms could not confer novelty over the cited prior art.

(b) These considerations were, however, based on the fact that there was already in the prior art a disclosure of the deodorant activity of the aromatic esters. Here by contrast, document E4 is totally silent on any activity associated with the presence of the metal particles in CLEARTUF 7202. In that respect, the argument of the Respondents that metal particles would have the same effect as carbon black (cf. point VII(iii.2.c) above) relies on inventive step considerations, which should be strictly distinguished from those of novelty (cf. T 572/88 of 27 February 1991 (not published in OJ EPO, Reasons point 4).

(c) In the decision T 279/93, the Board considered that the use of a known starting material in a known process for making a known end product in order to reduce the formation of specific impurities, did not require any new physical activity not already required by the old

use of the known starting material in the known process to make the desired end product, and that noticing that the end product has less impurities was a mere discovery.

(d) While in the case under consideration in T 279/93, there was in the prior art a direct link between the known starting material and the known end product by way of the known process (i.e. there was no new physical activity in relation of the starting component in the process), in the present case, however, as mentioned above, there is no indication in E4 of any physical activity of the metallic particles in the polyester, let alone of a link between metal particles content and reheat time. Furthermore, the attaining of a reduction of the reheat time by the use of the metal particles in respect of the same polymer not containing the metal particles could not have been noticed from E4, since there was no adequate basis for comparison in E4.

8.1.15 Concerning documents E1 and E2, the Board observes that these documents have a very similar content, since document E2 is a continuation in part of the US patent application No. 245838 of 20 March 1981, of which document E1 claims the priority.

8.1.16 As disclosed in these documents (cf. E1, page 2, lines 9 to 14; cf. E2, column 1, lines 15 to 25), some amount of metallic antimony is formed when an antimony catalyst is used in combination with a phosphite compound in the manufacture of polyester resins.

8.1.17 In this context, while it can be considered that the polyester referred to as a Sample 1 in Table III of both E1 and E2 would probably contain a certain amount of metallic antimony since a phosphite compound has been used in combination with an antimony catalyst for its preparation, neither E1 nor E2 mentions the amount of metallic antimony in that polyester.

8.1.18 Furthermore, neither E1 nor E2 discloses the reheat time of the respective bottle preforms made from the various polyesters exemplified in Table III thereof.

8.1.19 Thus, at least for these reasons E1 and E2 cannot be considered as prejudicing the novelty of the subject-matter of Claims 1 to 5.

8.2 Consequently, the Board comes to the conclusion that the subject-matter of Claims 1 to 5 is novel over the prior art referred to by the Respondents and that the decision under appeal must be set aside.

9. *Remittal*

9.1 The Opposition Division revoked the patent on the ground of lack of novelty, and as a consequence did not express its opinion regarding the ground of lack of inventive step.

9.2 Having regard to the requests of all the Parties for remittal to the first instance and in order not to deprive them of the possibility to be heard by two instances, the Board considers it appropriate to make use of its discretionary power under Article 111(1) EPC

and to remit the case to the first instance for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The main request of the Appellant is refused.

3. The case is remitted back to the first instance for further prosecution on the basis of Auxiliary Request I, filed at the oral proceedings.

The Registrar: The Chairman:

E. Görgmaier R. Young