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D E C I S I O N
of 3 February 2005

Case Number: T 0006/02 - 3.3.7

Application Number: 96103843.7

Publication Number: 0732432

IPC: D01F 2/28

Language of the proceedings: EN

Title of invention:
Photodegradable cellulose ester tow

Patentee:
Celanese Acetate, LLC.

Opponent:
Rhodia Acetow GmbH

Headword:

-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - (yes)"
"Inventive step (no) - problem and solution"

Decisions cited:
T 0079/82, T 0651/91, T 0295/94

Catchword:

-



Case Number: T 0006/02 - 3.3.7

D E C I S I O N
of the Technical Board of Appeal 3.3.7
of 3 February 2005

Appellant:
(Opponent)

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
8 October 2001 concerning maintenance of
European patent No. 0732432 in amended form.

Composition of the Board:

Chairman: R. E. Teschemacher
Members: B. J. M. Struif
G. Santavicca

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 732 432 with respect to European patent application No. 96 103 843.7 filed on 12 March 1996 was published on 11 November 1998. The granted patent comprised five claims, the independent claims reading as follows:

"1. A man-made fiber comprising:

a cellulose ester; and

0.05 to 5.0% by weight of titanium dioxide having an average particle size of less than 100 nanometers."

"2. A man-made fiber comprising:

a cellulose acetate having a degree of substitution per anhydroglucose unit of 1.5 to 2.7;

0.05 to 5.0% by weight of titanium dioxide having an average particle size of less than 100 nanometers; and being adapted to be substantially degraded, as measured by AATCC TEST METHOD 169-1990, in 300 hours or less."

"5. A cigarette comprising:

a tobacco column; and

a filter comprising the fibers set forth in claim 1-4."

II. On 28 July 1999 a notice of opposition was filed, in which the revocation of the patent in its entirety was requested on the grounds of Article 100(a) EPC with respect to lack of novelty and lack of an inventive

step. During the first instance proceedings the following documents were cited:

- D1: EP-A-0 597 478;
- D2: DE-B-24 36 260;
- D6: WO-A-93/24 685;
- D7: CA-A-1 073 581;
- D9: Römpps Chemie Lexikon, 9th ed., Georg Thieme Verlag, Stuttgart, 2398-2403, (1990);
- D10: Römpps Chemie Lexikon, 9th ed., Georg Thieme Verlag, Stuttgart, 616, (1989);
- D12: Appendix to the proprietor's letter dated 11 April 2000; Figure 1, showing a relationship between specific surface area and particle size of TiO₂ (number D12 has been added by the board to more clearly identify Figure 1 cited below).

III. In a decision notified in writing on 8 October 2001, the opposition division held that the patent as amended on the basis of a set of claims 1 to 5 received on 12 April 2000 as the sole request fulfilled the requirements of the EPC.

Claims 1 and 2 differed from granted claims 1 and 2 by the addition of the feature "and a specific surface area of greater than 50 m²/g" after the term "100 nanometer".

According to the decision:

- (a) The amended claims complied with the requirements of Article 123, paragraphs (2) and (3), EPC.

- (b) As to novelty, D2 generically disclosed only the terms "synthetic polymer materials" and "plastic materials" ("Kunststoffe") but did not mention any "cellulose ester" material. Since it was an accepted general principle that a generic disclosure did not take away the novelty of a specific example, D2 was not novelty destroying. As regards D1, this document did not disclose the claimed specific surface area greater than 50 m²/g. It was true that Figure 1 (D12) showed a plot of specific surface area versus nominal particle size established from three different particle sizes of TiO₂ from a single individual supplier (anatase, uncoated). However, the relation between the two properties depended on the way how TiO₂ was prepared, isolated and further (surface) treated, which resulted in a different structure of pores, surface and sphere form. Contrary to the presentation in Figure 1, a general invariable relationship between said properties did not exist. Hence, the specific surface area of D1 could not be deduced from Figure 1 so that D1 could not be considered as novelty destroying either. Thus, the claimed subject-matter was novel over D1 and D2.
- (c) As regards inventive step, D2, which generally related to the photo-chemical degradation of polymers, was the closest state of the art. The claimed subject-matter differed from D2 in that a cellulose ester was the material to be degraded. The problem to be solved was to provide a material combination which underwent faster photodegradation. The experimental evidence showed an unexpected increase in photodegradability.

Neither D2 nor any of the further cited pieces of prior art offered any suggestion that a cellulose ester might result in a faster photodegradation. Starting from D2 the skilled person was not confronted with a so-called one-way-street situation, in which the technical effect could be considered as a mere "bonus-effect". As to D1 or any of the further cited prior art documents, they did not suggest the material combination for providing the specific technical effect. Similar arguments applied if D7 was considered as the closest state of the art. Hence, the claimed subject-matter involved an inventive step.

- IV. On 18 December 2001, the opponent (appellant) lodged an appeal against the above decision, the prescribed fee being paid on the same day. The statement setting out the grounds of appeal was received on 18 February 2002.
- V. In a communication dated 10 November 2004, the board addressed the points to be discussed during the oral proceedings, in particular novelty and inventive step.
- VI. Oral proceedings were held on 3 February 2005.
- VII. The arguments of the appellant given in writing and at the oral proceedings can be summarized as follows:
 - (a) As to novelty, D2 disclosed the features of claim 1 except for the feature "cellulose ester". Since according to D2 fine particle size titanium oxide could be used to photodegrade any plastic material, i.e. including any non-specified cellulose esters, no purposive selection was made. Furthermore, the

teaching of D1 must be seen in the context of Figure 1 (D12), according to which the particle size of TiO_2 decreased with increasing specific surface area in a predictable manner. Since D1 disclosed a particle size of 10 nm, this corresponded to a specific surface area of ca. $150 \text{ m}^2/\text{g}$, exceeding the claimed lower limit of $50 \text{ m}^2/\text{g}$ considerably. Hence, D1 was novelty destroying for the subject-matter of claim 1. Since cellulose acetate was known from D10 and the fibres were produced in a conventional manner, the subject-matter of claim 2 was anticipated by D1 and D2 as well.

- (b) As regards inventive step, D1 was considered to represent the closest state of the art, since it related to fibres made of biodegradable cellulose ester composition containing titanium dioxide as a photodegradation accelerator, having particle sizes within the claimed range. The only difference over D1 was the specific surface area as claimed. The patent in suit did not show that this distinction led to any improved technical effect. Thus, if the problem to be solved was to provide a further biodegradable cellulose ester fibre, the provision of a different surface area was obvious. However, even if an improved technical effect was achieved such that the problem could be formulated more ambitiously, the claimed subject-matter was made obvious from D1 and D2. D2 already disclosed that fine particle grade titanium dioxide was a suitable photodegradation accelerator, in particular one having the claimed combination of particle size

and surface area. According to D2, a high specific surface area of TiO_2 was required for achieving a high degradability of the polymers. Since it was general technical knowledge that cellulose esters were thermoplastics, and since according to D1 cellulose fibres were considerably photodegraded by the addition of TiO_2 , they could be degraded in the same way as other thermoplastics mentioned in D2. Hence, the claimed subject-matter did not involve an inventive step.

VIII. The arguments of the respondent (proprietor) given in writing and in the oral proceedings can be summarized as follows:

- (a) As regards novelty, D2 did not disclose cellulose esters. The generic disclosure of "plastics" encompassed many thousands of materials and did not take away the novelty of a specific example, in line with a generally accepted principle in the patent practice. The claimed subject-matter differed from D1 in its specific surface area. The plot shown in Figure 1 (D12) did not represent any prior art and referred to a specific TiO_2 . The particular correlation derived from D12 could not provide information lacking in D1.
- (b) As to inventive step, the closest state of the art was D1, example 6, which had also been used as starting point in the patent in suit. Although the experimental conditions were not 100% identical with each other, the examples of the patent in suit showed a surprisingly improved degradation effect over example 6 of D1. The appellant had

nothing shown to the contrary. The problem to be solved was to provide a fibre which could be faster photodegraded. This problem had been solved. D2 did not concern cellulose ester fibres and was published almost 20 years before the claimed priority date. D2 had not been acknowledged in D1 nor had it been cited in the search report of the patent in suit. Therefore, the skilled person, when looking for solving the problem posed, got no incentive with a reasonable expectation of success from D2, that specific titanium dioxide particles would lead to an improved degradation when used in cellulose fibres. The skilled person had no motivation to look back to D2 without hindsight, since he was taught by D1 and D6, both published shortly before the priority date of the patent in suit, that the solution to a faster degradability of polymers went into a direction different from the invention. Therefore, the subject-matter of the claims involved an inventive step.

- IX. The appellant requested that the decision under appeal be set aside and that the European patent be revoked.
- X. The respondent requested that the appeal be dismissed and that the patent be maintained in the version underlying the decision under appeal.

Reasons for the Decision

- 1. The appeal is admissible.

Novelty

2. According to the appellant, the claimed subject-matter lacks novelty over D1 and D2.
- 2.1 D1 discloses a biodegradable cellulose ester composition comprising a cellulose ester having an average degree of substitution not exceeding 2.15 and showing a 4-week decomposition rate of not less than 60 weight percent as determined using the amount of evolved carbon dioxide as an indicator in accordance with ASTM 125209-91 (claim 1). That composition can further comprise at least one ingredient selected from the group consisting of a plasticizer, an aliphatic polyester, a photolysis accelerator and a biodegradation accelerator (claim 9). A preferred photolysis accelerator is an anatase type titanium dioxide (claim 14). That cellulose ester composition can comprise 0.1 to 5 parts by weight of photolysis accelerator based on 100 parts by weight of cellulose ester (Claim 21). The biodegradable cellulose ester composition can be formed to a fibre or fibrous article, which is used as a tow or a cigarette filter (Claims 28 and 29). The particle size of the titanium dioxide may for example be about 0.01 to 1 μm (10 to 1 000 nm) and is preferably about 0.05 to 0.5 μm . The specific surface area of titanium dioxide is generally about 3 to 30 m^2/g and preferably about 5 to 20 m^2/g (page 6, lines 27 to 30). Example 6 discloses cellulose acetate fibres comprising 0.5 parts by weight of anatase titanium dioxide having an average particle diameter of 300 nm but does not mention any specific surface area. In fact, a specific surface area of more than 50 m^2/g is not

directly mentioned in D1 nor is any specific "average" particle size mentioned.

The appellant argued that the teaching of D1 must be seen in the context of Figure 1 (D12) submitted by the respondent according to which an average particle size of 10 nm mentioned in D1 corresponded to a specific surface area of ca. 150 m²/g.

First of all, the particle size of 10 to 1000 nm mentioned in D1 is a particle size distribution (see patent in suit, page 2, line 22), which is not identical with an "average" particle size as claimed. Whether or not for certain ranges of particle sizes of D1 an average particle size within the claimed range can be calculated, the only specific average particle size disclosed in example 6 of D1 (300 nm) is outside the claimed range. Thus, the lowest value of the particle size distribution of 10 nm in D1 does not amount to an average particle size of 10 nm and thus cannot be used as starting point for any calculation.

Secondly, the plot of Figure 1 (D12) is no prior art document. It merely shows a relation between surface area and nominal particle size which is based on a specific anatase type TiO₂. Although it is uncontested that the particle size and surface area as shown in Figure 1 are to a certain degree related to each other, it has also been plausibly argued that any specific relation depends on the way how the TiO₂ is prepared, isolated and further (surface) treated, which can result in a different structure of pores, surface and spherical form (see also appendix A1 to A23, in particular A9, submitted with the respondent's letter

dated 11 April 2000). The appellant has not shown that a specific "average" particle size of 10 nm is automatically connected to a specific surface area within the claimed range.

In view of the above, the skilled person has no reason, when reproducing D1, to consider a surface area other than 5 to 30 g/cm² specifically disclosed in D1. Consequently, an average particle size of less than 100 nm in combination with an average surface area of more than 50 g/cm² has not been disclosed directly and unambiguously nor implicitly in D1.

2.2 D2 discloses the use of fine grade titanium dioxide having a specific surface area of more than 20 m²/g for the preparation of plastics which are readily degradable under the conditions of weather and/or light (claim 1). In claim 2 of D2 plastic compositions corresponding to the degradable plastics of claim 1 are defined. Suitable plastics are the usual plastics which can be obtained by polycondensation, polymerisation and polyaddition. Preferred are thermoplastics. Preferred polymers are included in a long list without mentioning cellulose esters (column 2, lines 47 to 66).

Suitable for the fast degradation of the plastics are very fine TiO₂-particles having an average particle size of 50 to 1500 Å (5 to 150 nm) and a specific surface area of more than 20 m²/g, in particular of 60 to 400 m²/g (column 3, lines 2 to 7). The plastic compositions can be manufactured to shaped articles, films, yarns and fibres (column 5, lines 19 to 21).

2.3 According to the appellant, it was generally known from D9 that cellulose esters were thermoplastics within the meaning of D2 so that no purposive selection was made.

According to D9, synthetic plastic materials comprise polycondensates, polymers and polyadducts and the general term "plastic" may also include modified biomaterials in form of thermoplastics such as cellulose nitrate, cellulose acetate, mixed cellulose ester and cellulose ethers (page 2399, Abb. 2). D2, however, does not mention any modified biomaterial such as cellulose esters as synthetic plastics.

According to the established case law, also reflected in the Guidelines for Examination in the European Patent Office, C-IV, 7.4, a generic disclosure (here plastic material) does not normally take away the novelty of any specific example (here cellulose esters) falling within that disclosure (Case Law of the Boards of Appeal of the European Patent Office, 4th Edition 2001, I.C.3.2.6 referring to T 651/91), let alone any specific physical structure thereof, namely cellulose ester fibres. The present situation is quite different from and not comparable with cases of selection inventions (Case Law, *supra*, I.C.4.1) wherein the novelty of chemical substances or groups of substances, for example in respect of general formulae (Markush formulae) under which they fall, is assessed, since the broad known concept of "plastics" does not make accessible any individualized cellulose esters having specific structural elements (cellulose groups) not disclosed in D1 so that it is not necessary to go into more detail.

- 2.4 Hence, neither D1 nor D2 directly and unambiguously disclose all of the features of claim 1 in combination. The same considerations apply *mutatis mutandis* to independent claim 2. Therefore, the claimed subject-matter is novel.

Closest prior art document

3. Both parties started from D1 as the closest state of the art.
- 3.1 D1 aims at cellulose ester articles, in particular in the form of fibres showing a high biodegradability (page 3, lines 7 and 10; point 2.1 above). In particular, reference is made to tows and cigarette filters and the biodegradability associated therewith (page 8, lines 1 to 5 and 11 to 18). When such an article is discarded outdoors, it is rapidly decomposed, thus reducing the risk of pollution (page 8, lines 24 and 25). By reference to D1, the patent in suit discloses that uncoated anatase type titanium dioxide can be used to accelerate the photodegradation of cellulose ester tows (page 2, lines 17 to 19).
- 3.2 Since the patent in suit addresses photodegradable cellulose ester tows that can minimize the littering problem associated with the disposal of spent cigarettes having filters made of cellulose ester tows, on roadsides and the like (page 2, lines 33 and 34), D1 corresponds to a purpose or technical effect similar to that of the patent in suit and requires a minimum of structural and functional modifications in accordance with established case law (Case Law, *supra*, I.D.3.1).

3.3 Since D1 is a suitable starting point according to established case law and is used in the patent in suit for formulating the problem posed, and since both parties agree on that starting point, the board has no reason to take a different position (Case Law, *supra*, I.D.3.5). Hence, D1 can be considered as the most appropriate document for assessing inventive step.

Problem and solution

4. According to the patent in suit, all yarns were prepared in a conventional manner: Cellulose acetate polymer is dissolved in a solvent of 96% acetone and 4% water. If titanium dioxide is added, it is done after the polymer is dissolved in the solvent. The mixture is stirred until homogenous, and filtered. After filtering, yarn is extruded through a 190 hole spinnerette with a hole diameter of 52 μm . This results in a fiber with 2.9 denier/filament. The yarns are evaluated according to the procedures of the American Association of Textile Chemist and Colorists (AATCC). AATCC Test Method 169-1990 "Weather Resistance of Textiles: Xenon Lamp Exposure", Option 1 is used. Yarns are prepared for evaluation according to AATCC Test Method 177-1993 "Colorfastness to Light at Elevated Temperature and Humidity: Water Cooled Xenon Lamp Apparatus". The yarns are wrapped around a paper card and placed in a metal holder of an Atlas model C65 WeatherOmeter and subjected to alternating conditions of Xenon light exposure and water spray. At 100 hours intervals, which roughly relate to one month outdoors exposure, yarns are removed, conditioned to ambient conditions and then the breaking strength is measured.

- 4.1 In Example 1 the yarn is prepared by using 61.23 g of a pigment grade TiO_2 (Kemira 0-310; anatase) with a median diameter of 420 nm. In Example 2 no TiO_2 is added. In Example 3 61.23 g (0.5 wt%) of Kemira 0-310 TiO_2 (anatase) plus 61.23 g (0.5 wt%) of Hombifine N ultra fine grind TiO_2 (anatase) with a primary particle diameter of less than 10 nm is used. In Example 4 61.23 g (0.5 wt%) of Hombifine N TiO_2 is used. In Example 5 122.47 g (1.0 wt%) of Hombifine N TiO_2 is used.
- 4.2 According to Table 1, a yarn prepared with ultra fine TiO_2 , (Examples 3, 4, and 5) disintegrates quicker than yarn prepared with a pigment grade TiO_2 or containing no TiO_2 at all. Even though Examples 3 and 4 both contained the same amount of ultra fine grind TiO_2 , Example 3, which also contained a pigment grade TiO_2 , disintegrated slower than Example 4 which only contained the ultra fine grind TiO_2 . This is due to the light refractive characteristics of a pigment grade TiO_2 . After 200 h the tenacity of the yarns according to comparative examples 1 and 2 has reduced to about 50% whilst the retention in tenacity of yarns according to examples 3 and 4 was less than 13 %. Yarns according to example 5 were completely disintegrated after 200h.
- 4.3 The yarns according to example 6 of D1 are 5-denier filaments and contain 0.5 % by weight of anatase TiO_2 having an average particle size of 300 nm and were tested using a fade-O-meter according to JIS L-standard 1013 (see D1, page 11, lines 1 and 2). The retention of tensile strength of a titanium dioxide modified cellulose acetate fibre after 200 h irradiation is 54% (Table 3, page 11). The yarns exemplified according to

the patent in suit containing 2.9 denier/filament use the same amount of TiO_2 and the same anatase type of TiO_2 . Furthermore, the average particle diameter in comparative example 1 of the patent in suit is 420 nm i.e. greater than the size of 300 nm as used in example 6, but both sizes being far outside the average particle size as claimed. Although the specific surface area of example 6 of D1 is not indicated, it must be assumed that the pigment used in example 6 is within the range of 3 to 30 m^2/g as disclosed in D1. That specific surface area is outside the claimed range and since the appellant has not proven anything to the contrary, it can be assumed that the patent in suit plausibly shows an improved effect in comparison to the state of the art.

- 4.4 However, the appellant argued that the specific technical effect, if any, was not due to the claimed different specific surface area.
- 4.4.1 Only in example 6 of D1 cellulose ester fibres are combined with anatase particles. According to example 1 of the patent in suit, the retention of tensile strength after 200 h is 50.9% (0.54 : 1.14), which percentage is similar to that shown for example 6 of D1 after 200 h (54%; point 4.3) so that in both cases comparable results are obtained. Furthermore, in examples 3 to 5 of the patent in suit Hombifine N TiO_2 is used, which has a particle size of less than 10 nm (page 4, line 4) and a specific surface area greater than 50 m^2/g (page 3, lines 8 to 10). Hence the TiO_2 particles of example 3 to 5 use the claimed combination of particle size and surface area. Although admittedly no direct comparison between an example of the patent

in suit and the closest state of the art (example 6 of D1) has been made, it is plausible to assume from the above that the claimed combination leads to an improved effect compared to example 6 of D1 (point 4.3 above).

4.5 Hence, the problem to be solved over D1 can be seen in providing a fibre which has an improved photodegradability in line with the patent in suit (page 2, lines 33 and 34). The solution of the above problem is the incorporation of ultra fine grade TiO_2 in the cellulose ester fibres in accordance with claims 1 and 2.

4.6 In view of the above reasons, the board comes to the conclusion that the problem has been effectively solved by the subject-matter of the claims.

Inventive step

5. It remains to be decided whether the claimed subject-matter is obvious having regard to the documents on file.

5.1 Although D1 already suggests to use particles within a particle size distribution of 10 to 1000 nm, preferably from 50 to 500 nm, the specified surface area of 3 to 30 m^2/g is well below the claimed range of more than 50 m^2/g . Thus, the claimed subject-matter is not rendered obvious from D1 alone.

5.2 According to D2, fine particle grade TiO_2 having an average particle size of 5 to 150 nm and a specified surface area of 60 to 400 m^2/g are particularly suitable for photodegradation of synthetic polymers (column 2, line 67 to column 3, line 7). Hence, D2 teaches that

the average particle diameter and the specific surface area of anatase titanium dioxide particles type significantly influence the photodegradation of the polymers. In particular, such fine grade TiO_2 particles are specifically effective to degrade films of polyethylene after 350 h to about 30% as shown by the retention in tear strength in table 2. In those examples, example 1 is for comparison purpose (without titanium dioxide) whilst from the other nine examples eight use particles having a specific surface area higher than 50 g/m^2 . Only example 4 of table 2 uses a specific surface area of 40 g/m^2 , outside the claimed range, and its retention reduction is less than that of the other examples. All those particles have crystallite particle sizes, from which the average particle size as claimed can be calculated (D2, table 4 in connection with column 3, lines 2 to 7). Having regard to the tear strength measured, the higher specific surface area of the particles used in examples 2 and 3 and 5 to 10 show a clear tendency to provide a higher degradation than in example 4 with a lower specific surface area (see table 2, time in weatherometer after 190, 350, 511 and 700 h and last column).

- 5.3 Since it is known from D1 that fine grade TiO_2 can effectively be used for the degradation of cellulose ester fibres, the fact that D2 does not mention any cellulose esters does not play any role. According to D2, fine grade TiO_2 particles having the claimed specific surface area and average particle size in combination can be used for the preparation of fibres made of any synthetic polymer and having photodegradability. Thus, D2 provides an incentive with

a reasonable expectation of success to replace the TiO₂ particles of D1 by those recommended in D2. It follows from the above that the improved degradation effect of the patent in suit over that of D1 is an obvious result, which the skilled person will achieve when plainly and logically following the teaching of the cited prior art.

5.4 The appellant argued that D2 was a prior art far removed from the specific technical field of cellulose ester fibres and published more than 20 years before the priority claimed. Hence, the skilled person when looking for solving the problem posed, had no motivation to look back to D2 without hindsight, since he knew from D1 and D6 published shortly before the priority date that those documents dealing specifically with photodegradability of cellulose esters had not considered that old document.

5.4.1 Although D2 was published about 20 years before the priority date, it nevertheless aims at providing a photodegradable plastic composition in general, in particular in the form of fibres made thereof (point 2.2). According to D2, the physical structure of titanium dioxide is identical with the claimed invention. Thus, D2 relates to a technical effect, namely the photodegradation of polymers, similar to that underlying the claimed invention, by using the same kind of titanium dioxide as claimed and was considered as starting point for evaluating inventive step by the opposition division in its decision, which position was not objected to by the respondent (see decision under appeal point 5.a). A prior art which is found suitable to represent the closest state of the art in the first instance proceedings cannot be a prior

art far away from the claimed invention. Quite to the contrary, the skilled person would consider D2 as being highly relevant.

5.4.2 Secondly, according to established case law, the age of a document long before the filing date might only be an indication of inventive step, if a need for the solution of an unsolved problem had existed for the whole time between the date of the document and that of the invention (Case Law, *supra*, I.D.7.3, compare T 79/82 and T 295/94). However, shortly before the priority date not only D1 but also D6 had come to the attention of the skilled person. According to both documents environmentally non-persistent cellulose ester fibres were used in cigarette filters and could be photodegraded by using titanium dioxide particles (see D6, claim 5 and D1, point 3.1 above). Hence, as explained under point 3 above, the principal problem of photodegradability of cellulose ester tows had been known and solved by using titanium dioxide particles. This technical development made prior art related to the degrading properties of titanium dioxide interesting for the person skilled in the art.

5.4.3 From the above it follows that there was no reason for the skilled person not to consider D2, since a need had not existed for the whole time between the date of D2 and that of the invention and since D2 taught that a faster degradability of polymers in general had been achieved by using titanium dioxide having the same particle size and specific surface area as claimed.

5.5 Hence, the subject-matter of claim 1 does not involve an inventive step when starting from D1 as the closest

state of the art. If for the sake of an argument, the skilled person started from D2, the claimed subject-matter would not be inventive either, since D1 and D6 already suggested that cellulose esters could be photodegraded by the use of TiO₂ particles.

- 5.6 In view of the above it is not necessary to consider whether any of the other claims involve an inventive step, since the patent can only be maintained if the claimed subject-matter is allowable as a whole.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

C. Eickhoff

R. Teschemacher