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Datasheet for the decision of 15 November 2023

Case Number: T 0114/21 - 3.3.03

Application Number: 13764049.6

Publication Number: 2829574

IPC: C08L69/00, C08G64/08, C08L101/00, F21V3/00, F21V3/04, G02B5/02

Language of the proceedings: EN

Title of invention:
LIGHT-DIFFUSIBLE RESIN COMPOSITION

Patent Proprietor:
Teijin Limited

Opponent:
SABIC Global Technologies B.V.

Relevant legal provisions:
RPBA 2020 Art. 12(4), 12(6)
EPC Art. 56

Keyword:
Late-filed evidence - admitted (no)
Inventive step - closest prior art
Inventive step - all requests - obvious solution (yes)

Decisions cited:
T 0698/10, T 0638/16

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Beschwerdekammern

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Case Number: T 0114/21 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 15 November 2023

Appellant: (Opponent)	SABIC Global Technologies B.V. Plasticslaan 1 4612 PX Bergen op Zoom (NL)
Representative:	Sabic Intellectual Property Group Sabic Intellectual Property Department P.O. Box 3008 6160 GA Geleen (NL)
Respondent: (Patent Proprietor)	Teijin Limited 6-7 Minamihommachi 1-chome Chuo-ku Osaka-shi, Osaka 541-0054 (JP)
Representative:	Beckmann, Claus Kraus & Weisert Patentanwälte PartGmbB Thomas-Wimmer-Ring 15 80539 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 16 December 2020 rejecting the opposition filed against European patent No. 2829574 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	D. Semino
Members:	M. Barrère
	A. Bacchin

Summary of Facts and Submissions

I. The appeal of the opponent lies against the decision of an opposition division rejecting the opposition against European Patent No. 2 829 574.

II. The following documents were *inter alia* cited in the decision of the opposition division:

D1: JP 2009-191226
D1a: Machine translation of D1
D4: EP 2578636 A1
D7: JP H10-46022
D7a: Machine translation of D7
D8: Declaration of Mr. Toshiyuki Miyake, dated 24 February 2016, filed with the USPTO
D9: US 2004/0066645 A1

III. In that decision the opposition division held, among others, that the subject-matter of granted claim 1 involved an inventive step over D7 or D1 as the closest prior art.

IV. The opponent (appellant) filed an appeal against said decision. The following document was filed with the statement of grounds of appeal:

D22: US 2006/0146228 A1

V. With the rejoinder to the statement of grounds of appeal, the patent proprietor (respondent) filed five sets of claims as auxiliary requests 1 to 5.

VI. Oral proceedings were held before the Board on 15 November 2023.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed or, in the alternative, that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the claims of one of auxiliary requests 1 to 5 filed with the rejoinder to the statement of grounds of appeal.

VIII. Claim 1 as granted (main request of the respondent) reads as follows:

> "1. A light-diffusing resin composition comprising 100 parts by weight of a resin component containing a polycarbonate (component A) and a polycarbonate-polydiorganosiloxane copolymer (component B) and 0.05 to 10.0 parts by weight of a light diffusing agent (component C),
>
> wherein the component B is a polycarbonate-polydiorganosiloxane copolymer in which polydiorganosiloxane domains having an average size of 0.5 to 40 nm are existent in a polycarbonate matrix, the average size of the polydiorganosiloxane domains being measured by a small angle X-ray scattering (SAXS) method,
>
> wherein the component C is silicone crosslinked particles having an average particle diameter of 0.01 to 50 μm, wherein the average particle diameter indicated a 50% value (D50) of an integral

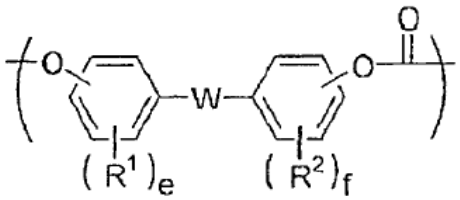
particle size distribution obtained by a laser diffraction/scattering method."

Claim 1 of auxiliary request 1 differed from granted claim 1 in that the average size of the polydiorganosiloxane domains was between **5** and 40 nm (emphases here and below added by the Board).

Claim 1 of auxiliary request 2 differed from granted claim 1 in that the average size of the polydiorganosiloxane domains was between **5** and **18** nm.

Auxiliary requests 3 to 5 differed respectively from the main request and auxiliary requests 1 and 2 in that the following feature was added at the end of claim 1:

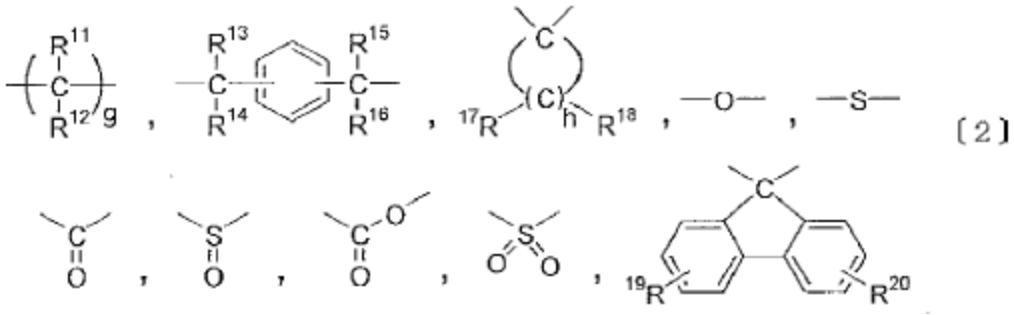
"wherein the component B is a polycarbonate-polydiorganosiloxane copolymer containing a unit represented by the following formula [1] and a unit represented by the following formula [3],



[1]

[In the above formula [1], R^1 and R^2 are each independently a group selected from the group consisting of hydrogen atom, halogen atom, alkyl group having 1 to 18 carbon atoms, alkoxy group having 1 to 18 carbon atoms, cycloalkyl group having 6 to 20 carbon atoms, cycloalkoxy group having 6 to 20 carbon atoms, alkenyl group having 2 to 10 carbon atoms, aryl group having 3 to 14 carbon atoms, aryloxy group having 3 to 14 carbon atoms, aralkyl group having 7 to 20 carbon atoms,

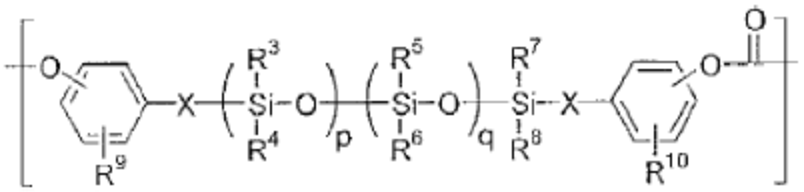
aralkyloxy group having 7 to 20 carbon atoms, nitro group, aldehyde group, cyano group and carboxyl group, and may be the same or different when there are a plurality of R^1's and a plurality of R^2's, "e" and "f" are each an integer of 1 to 4, and W is a single bond or at least one group selected from the group consisting of groups represented by the following formulas [2].



[2]

(In the above formulas [2], R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17} and R^{18} are each independently a group selected from the group consisting of hydrogen atom, alkyl group having 1 to 18 carbon atoms, aryl group having 3 to 14 carbon atoms and aralkyl group having 7 to 20 carbon atoms, R^{19} and R^{20} are each independently a group selected from the group consisting of hydrogen atom, halogen atom, alkyl group having 1 to 18 carbon atoms, alkoxy group having 1 to 10 carbon atoms, cycloalkyl group having 6 to 20 carbon atoms, cycloalkoxy group having 6 to 20 carbon atoms, alkenyl group having 2 to 10 carbon atoms, aryl group having 3 to 14 carbon atoms, aryloxy group having 6 to 10 carbon atoms, aralkyl group having 7 to 20 carbon atoms, aralkyloxy group having 7 to 20 carbon atoms, nitro group, aldehyde group, cyano group and carboxyl group, and may be the same or different when there are a plurality of R^{19}'s and a plurality of R^{20}'s,

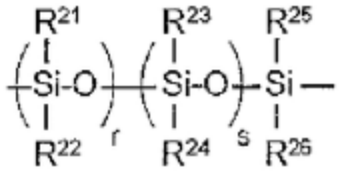
"g" is an integer of 1 to 10, and "h" is an integer of 4 to 7.)



[3]

(In the above formula [3], R^3, R^4, R^5, R^6, R^7 and R^8 are each independently a hydrogen atom, alkyl group having 1 to 12 carbon atoms, or substituted or non-substituted aryl group having 6 to 12 carbon atoms, R^9 and R^{10} are each independently a hydrogen atom, halogen atom, alkyl group having 1 to 10 carbon atoms or alkoxy group having 1 to 10 carbon atoms, "p" is a natural number, "q" is 0 or a natural number, (p+q) is a natural number of not more than 150, and X is a divalent aliphatic group having 2 to 8 carbon atoms.)

wherein the content of a unit represented by the following formula [4] contained in the formula [3] is 0.01 to **0.2** wt% based on the total weight of the resin composition.



[4]

(In the above formula [4], R^{21}, R^{22}, R^{23}, R^{24}, R^{25} and R^{26} are identical to R^3, R^4, R^5, R^6, R^7 and R^8 of the formula [3], respectively, and "r" and "s" are the same as "p" and "q" in the formula [3], respectively.)"

The remaining claims of these requests are not relevant to this decision.

IX. The appellant's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Admittance of document D22

Document D22 should be admitted into the proceedings.

(b) Inventive step

The subject-matter of claim 1 as granted and claim 1 of auxiliary requests 1 to 5 lacked an inventive step over document D7 as the closest prior art.

X. The respondent's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Admittance of document D22

Document D22 should not be admitted into the proceedings.

(b) Inventive step

D7 was not a suitable starting point for assessing inventive step. However, even if it were, the subject-matter of claim 1 as granted and claim 1 of auxiliary requests 1 to 5 involved an inventive step over this document as the closest prior art.

Reasons for the Decision

1. Admittance of document D22

1.1 D22 is a new item of evidence filed with the statement of grounds of appeal and referred to as document E4 in the appellant's submissions. Its admission to the proceedings, which is contested by the respondent, is subject to the discretionary power of the Board in accordance with Article 12 paragraphs (4) to (6) RPBA.

1.2 According to the appellant, D22 was filed in reaction to the reasoning of the opposition division in the contested decision. It is directed to establishing that, contrary to the decision, granted claim 1 lacks an inventive step over document D7 as the closest prior art (see statement of grounds of appeal, page 12, first paragraph and page 13, from the fourth paragraph). In particular, this document would show that crosslinked silicone particles were obvious alternatives to the crosslinked acrylic particles of D7 (see statement of grounds of appeal, pages 13 to 14, bridging paragraph).

The appellant further argued that D22 was highly relevant as it also provided evidence that similar properties could be obtained with silicone crosslinked particles and with acrylic crosslinked particles provided that the amount of particles was adjusted in each case. Finally, while there were many documents in the field of light diffusing materials, it had been difficult to find a document such as D22 comparing silicone particles with acrylic particles and showing that the properties could be the same.

1.3 The respondent held that document D22 should have been filed during the opposition proceedings (see rejoinder to the statement of grounds of appeal, page 5, second paragraph).

1.4 It was not disputed that the question of the obviousness of silicone crosslinked particles (as compared to acrylic crosslinked particles) was discussed by the parties from the onset of the opposition proceedings (see notice of opposition, page 13, point 3.5). This point was further addressed by the patent proprietor and finally by the opposition division in the contested decision (see point 28 of the Reasons). Although the opposition division was not convinced by the opponent's facts and arguments in that respect, the Board does not consider that this fact can justify filing additional evidence in support of their case. In fact, the appellant has not identified any specific aspect of the proceedings, such as a late turn of events at the oral proceedings, or a surprising interpretation by the opposition division at a late stage or in the decision, that could justify the filing of D22, but rather appeared motivated by the fact that the opposition division had not been convinced by the arguments and facts on file. Consequently, the Board considers that if the appellant had intended to support their attack on lack of inventive step in respect of cross-linked silicone particles with D22, they should have filed that document during the opposition proceedings.

As regards the relevance of D22, it is pointed out that this criterion alone is not sufficient to justify the admittance of a late-filed document in the appeal proceedings, otherwise there would be nothing to prevent an opponent from withholding (highly) relevant

prior art until the filing of the grounds of appeal (see Case Law of the Boards of Appeal, 10th edition 2022, in the following "Case Law", V.A.5.11.3 a)). The same principle applies to the alleged difficulty in finding document D22.

1.5 Under these circumstances, the Board finds it appropriate to exercise its discretion under Article 12(6) RPBA not to admit document D22 into the proceedings.

Main request (patent as granted)

2. Inventive step

The appellant held that the subject-matter of granted claim 1 lacked an inventive step over D7 as the closest prior art.

Documents D1 and D7 were published in a non-official language. The Board will therefore refer below to their English translation provided by the appellant (D1a and D7a).

2.1 Choice of the closest prior art

2.1.1 While the appellant agreed with the opposition division that D7a was a valid starting point for assessing inventive step (see contested decision, point 22 of the Reasons), the respondent essentially argued that D1a was a better starting point and that the scope of the problem-solution approach was to select one document as the closest prior art and not multiple starting points.

In particular, the respondent pointed out that a key aspect of the claimed invention was to provide a light-

diffusing material having excellent hue in the sense that the material is achromic (see opposed patent, paragraphs [0008] and [0145]). However, D7a, unlike D1a, was silent on this aspect (see D1a, paragraph [0001] and D7a, paragraph [0004]). In view of the fact that the purpose of D1a was closer to that of the opposed patent than D7a, D1a (and not D7a) was to be considered as the closest prior art for the subject-matter of granted claim 1.

Furthermore, the respondent held that the choice of multiple documents as the closest prior art was only required if it had been convincingly shown that these documents were equally valid springboards. However, in view of the different purpose of D7a, D1a and D7a would not be equally valid.

2.1.2 The first point of dispute is to what extent multiple documents may be used as the closest prior art.

In that respect, it is established case law that, if the skilled person has a choice of several workable routes, i.e. routes starting from different documents, which might lead to the invention, the rationale of the problem and solution approach requires that the invention be assessed relative to all these possible routes, before an inventive step could be acknowledged (see Case Law, I.D.3.1.).

The Board has no reason to deviate from that approach. In fact, it is considered that D7a cannot be ignored merely because D1a would appear to be a better or more promising starting point to arrive at the subject-matter of claim 1. It should also be noted that the documents on file depend on the parties citing them. In the present case, the appellant might have overlooked

D1a in preparing their case or might have chosen not to use it. In this situation, the Board would have been left with the only question whether D7a is a suitable closest prior art. Therefore, it is the Board's position that the suitability of D7a as the closest prior art should be assessed on its own, without considering whether other available documents might be more suitable starting points.

2.1.3 The second question to be answered it therefore whether D7a is a suitable starting point for assessing inventive step.

A central consideration in selecting the closest prior art is that it must be directed to the same purpose or effect as the claimed invention (see Case Law, I.D. 3.2).

The opposed patent pertains to light-diffusing resin compositions for use in lighting covers or diffusion plates for displays and glass substitutes (see paragraph [0001]). In view of the fact that document D7a is directed to light-diffusing materials having the same uses (see D7a, paragraph [0001]), it is not unreasonable to consider D7a as a starting point for assessing the inventive step of granted claim 1.

While this analysis is in itself sufficient for the choice of D7a as the closest prior art, it is nevertheless pointed out that an object of D7a is to provide a material having high light-diffusing properties which is also an object of the opposed patent (see D7a, paragraph [0004]). The Board agrees with the respondent that D7a does not address the issue of improving the hue of light-diffusing materials, however this property is just one of multiple problems

that the opposed patent is trying to address (see opposed patent, paragraph [0001]). In any event, the Board considers that the fact that one problem is not mentioned in D7a cannot justify to dismiss this document as starting point. In that respect, reference is made to decisions T 0698/10 (points 3.3 and 3.4 of the Reasons) and T 0638/16 (point 1.2.6 of the Reasons) in which the respective Boards considered that the closest prior art did not have to disclose all the problems solved by the claimed invention and not even the objective technical problem which is only identified in the next step of the problem-solution approach.

2.1.4 For these reasons, document D7a is a reasonable starting point for assessing inventive step.

2.2 Distinguishing feature and problem to be solved

The parties agreed with the opposition division that:

(a) the subject-matter of granted claim 1 differed from D7a in that the light-diffusing composition comprised:

(i) silicone crosslinked particles as light diffusing agent (instead of acrylic crosslinked particles in the examples of D7a);

(b) the objective technical problem to be solved was the provision of a composition having an increased diffusion of light.

The Board has no reason to depart from that view.

2.3 Obviousness

2.3.1 It remains to be evaluated whether it was obvious for a person skilled in the art wishing to provide a composition with an increased light diffusion, to replace the acrylic crosslinked particles by silicone crosslinked particles.

2.3.2 According to the respondent, D7a aimed at obtaining compositions with a high total light transmittance (see D7a, paragraph [0004]). This goal was achieved by using acrylic crosslinked particles which are an essential feature of D7a. It was however shown in D4 and in the opposed patent that the replacement of acrylic particles with silicone particles led to a decrease in total light transmittance (see D4, table 1, examples 1-3 and 1-7 and opposed patent, table 1, examples 9 and 11). Therefore, starting from D7a as the closest prior art (whose objective is to achieve a high total light transmittance), the skilled person would have no incentive to replace these particles with other particles, such as cross-linked silicone particles, as this would result in an undesired reduction in light transmittance.

Additionally the respondent argued that D7a was silent on the relationship between the size of the polydiorganosiloxane domains and the hue (see rejoinder to the statement of grounds of appeal, page 22, first two paragraphs). In contrast, it was shown in the opposed patent that a domain size between 0.5 and 40 nm allowed to improve the hue of the light diffusing material.

2.3.3 The appellant held that it was obvious for the skilled person based on the teaching of D4 or D9 or based on

common general knowledge to replace the acrylic crosslinked particles of D7a with silicone crosslinked particles in order to increase the diffusion of light. Moreover, it would be known that such an increase could not be achieved without decreasing at the same time the total light transmittance. In addition, D7a would not define what a high total light transmittance meant, so that the skilled person could still accept some reduction.

2.3.4 The Board first notes that the parties agree that it was known that the replacement of acrylic crosslinked particles with silicone crosslinked particles leads to an increase in light diffusion accompanied by a decrease in total light transmittance. As noted above by the respondent, this result can be derived from D4 (and was confirmed by the opposed patent). It is however disputed whether the skilled person, starting from D7a as the closest prior art, would have accepted a decrease of the total light transmittance, as this would go against an objective of D7a.

In the present case, the problem to be solved is the provision of a composition having an increased diffusion of light. It is however common general knowledge that, everything else being equal, light diffusion cannot be increased without increasing diffuse light reflection and therefore decreasing the total light transmission (as illustrated in table 1 of D9). In other words, the person skilled in the art wishing to increase the light diffusion would have been aware of the trade-off associated with this increase, namely the reduction of the overall light transmission (as confirmed in D4, D9 and in the opposed patent). This fact was also not disputed by the parties.

As far as the total light transmittance is concerned, it is underlined that the experimental results of the opposed patent make no exception: while the percentage of total light transmittance in the presence of acrylic crosslinked particles was respectively 73% and 80% in examples 10 and 11, it drops to values between 37% and 64% in the presence of silicone crosslinked particles. Therefore, even if it is not defined as an explicit goal of the opposed patent to decrease the total light transmittance, this side effect is recognised and accepted.

Consequently, the skilled person wishing to increase the diffusion of light would have accepted an unavoidable decrease in total light transmittance.

2.3.5 The respondent argued that, starting from D7a, the skilled person would not have accepted a reduction of the total light transmittance. However, this contradicts the objective problem to be solved (increase in light diffusion), which goes hand in hand with a reduction in total light transmittance. Besides, it is undisputed that an objective of D7a is also to achieve a high level of light diffusion (see D7a, paragraph [0004]), so that the argument that the skilled person would not have accepted to decrease the total light transmittance cannot be followed.

2.3.6 The respondent also referred to the lack of teaching in D7a on the domain size of the polydiorganosiloxane (PDOS). The Board considers that this argument is irrelevant in the context of D7a. The parties did not argue that the PDOS domain size was a distinguishing feature between granted claim 1 and D7a. In fact, in document D8, a statement made by an employee of the respondent to the USPTO, it was mentioned that the

domain size in a poylcarbonate-polydimethylsiloxane (PC-PDMS) of D7a was 8 nm (see D8, page 3, paragraphs 2. and 3.), which fact was not disputed by the parties. Given that the PDOS domain size is not a distinguishing feature, it also cannot be argued (as the respondent suggests) that the compositions of the opposed patent should be characterised by an improved hue.

2.3.7 In conclusion the Board considers that the skilled person wishing to increase the light diffusion of the compositions of D7a would have modified the teaching of this document even if it could be expected that the overall light transmission would be reduced as a side effect.

It was known from D4 and D9 and undisputed that the replacement of acrylic crosslinked particles by silicone crosslinked particles in a polycarbonate material leads to an increased light diffusion (see table 1 of D4 or D9).

Furthermore, based on Snell's law, it belongs to the common general knowledge of a skilled person to increase the refractive index difference between the polycarbonate matrix and the diffusing particles in order to increase light diffusion. For this reason too, the choice of any diffusing particles with a greater difference in term of refractive index (such as silicone crosslinked particles) compared to acrylic crosslinked particles was obvious to the skilled person (as shown in table 1 of D9).

2.4 Therefore, the subject-matter of granted claim 1 does not involve an inventive step over D7a in combination with D4, D9 or common general knowledge.

Auxiliary requests 1 and 2

3. Inventive step

3.1 In claim 1 of these requests, the average size of the PDOS domains was limited to

5 to 40 nm for auxiliary request 1 and

5 to 18 nm for auxiliary request 2.

3.2 As noted above (see point 2.3.6), it is derivable from D8 that the domain size in the poylcarbonate-polydimethylsiloxane (PC-PDMS) of D7a was 8 nm (see D8, page 3, paragraphs 2. and 3.). This fact was also not contested by the respondent who accepted that the only distinguishing feature between granted claim 1 and D7a was the presence of crosslinked silicone particles.

3.3 Consequently, the additional limitation of claim 1 of auxiliary requests 1 and 2 is implicitly disclosed in D7a, so that there is no further distinguishing feature resulting from the amendment. In view of this, the Board comes to the conclusion that the subject-matter of claim 1 of these requests does not involve an inventive step over D7a, for the same reasons as outlined above (see point 2. of the present decision).

Auxiliary requests 3 to 5

4. Inventive step

4.1 Auxiliary requests 3 to 5 differ from the main request and auxiliary requests 1 and 2, respectively, in that, in claim 1, the limitations of granted claims 2 to 4 have been incorporated into claim 1 (reference is made

to point VIII. for the exact wording of the additional feature). By this amendment, the parties argued that the content of siloxane units (represented by formula [4]) was limited to 0.01 to 0.2 wt% based on the total weight of the resin composition (see rejoinder to the statement of grounds of appeal, page 2, penultimate paragraph and page 36, fifth paragraph).

4.2 The appellant considered that this additional feature was disclosed in D7a or D11 (see statement of grounds of appeal, page 28, third full paragraph). This fact was disputed by the respondent. At the same time, however, the respondent conceded that the content of PDOS units in the examples of D7a ranged from 0.2 wt.% to 2 wt.% (see rejoinder, page 36, penultimate paragraph).

4.3 In the present case, the Board agrees with the appellant (considering the table provided on page 10 of the statement of grounds of appeal and taken from D7). Indeed, the PDMS content in example 8 of D7 is 0.2 wt%, which anticipates the additional limitation of auxiliary requests 3 to 5.

4.4 Consequently, the additional limitation of claim 1 of auxiliary requests 3 to 5 is disclosed in D7a, so that there is no further distinguishing feature resulting from the amendment. In view of this, the Board comes to the conclusion that the subject-matter of claim 1 of these requests does not involve an inventive step over D7a for the same reasons as outlined above (see point 2. of the present decision).

5. As all operative requests are not allowable, the decision under appeal is to be set aside and the patent is to be revoked.

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:

D. Hampe D. Semino

Decision electronically authenticated