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D E C I S I O N
of 26 November 2003

Case Number: T 0371/02 - 3.3.3

Application Number: 94830082.7

Publication Number: 0669369

IPC: C08L 3/02

Language of the proceedings: EN

Title of invention:

Starch based composition and process for making biodegradable packaging products

Patentee:

OBTUSA INVESTIMENTOS E GESTAO LIMIDADA

Opponent:

NOVAMONT SPA

Headword:

-

Relevant legal provisions:

EPC Art. 104(1), 111(1), 114(2)

Keyword:

"Late-filed document - admitted (yes)"
"Apportionment of costs (no)"
"Remittal to opposition division"

Decisions cited:

T 0117/86, T 0291/89, T 1002/92, T 0223/95, T 1063/98

Catchword:

-



Case Number: T 0371/02 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 26 November 2003

Appellant:
(Opponent)

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Representative:

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Respondent:
(Proprietor of the patent)

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 February 2002 concerning maintenance of
European patent No. 0669369 in amended form.

Composition of the Board:

Chairman: R. Young
Members: C. Idez
B. Schachenmann

Summary of Facts and Submissions

I. The grant of the European patent No. 0 669 369 in the name of Obtusa Investimentos E Gestao Limitada in respect of European patent application No. 94 830 082.7 filed on 24 February 1994 was announced on 6 May 1999 (Bulletin 1999/18) on the basis of 19 claims.

Independent Claims 1, 8, 10, 14, 15, 17, and 18 read as follows:

"1. Starch-based composition for the production of biodegradable products, comprising in weight parts on total weight thereof:

- starch in an amount comprised between 96% and 99% in weight, said starch incorporating an amount of amylose comprised between 18% and 43% in weight on the total weight thereof;
- at least a weak acid or hydrochloric acid in an amount comprised between 0.2% and 2% in weight;
- at least a lipid in an amount comprised between 0.5% and 2% in weight;

characterized in that said at least one lipid is a vegetable oil chosen among the group comprising: peanut oil, maize oil, palm oil, and mixtures thereof.

8. Use of the composition according to any of claims 1 to 7, for the production of biodegradable shaped products.

10. Biodegradable low-density expanded shaped product obtainable by extrusion starting from a starch-based composition according to any of the claims 1 to 7 and having a bulk density comprised between 10 and 40 g/l, a resiliency of at least 30% and a compressibility comprised between 0.02 and 0.2 kN.

14. Process for the production of a biodegradable low-density expanded shaped product, comprising the steps of:
 - mixing 96-99 parts in weight of a starch with 0.2-2 parts of at least a weak acid or hydrochloric acid and 0.5-2 parts of at least a lipid, thus obtaining an homogeneous mixture, said starch incorporating an amount of amylose comprised between 18% and 43% in weight on the total weight thereof;
 - submitting to gelation said mixture by means of mechanical working in an extrusion chamber of an extrusion device at a pre-established pressure;
 - extruding said gel-like mixture through a die of a prefixed shape, thus obtaining a low-density expanded product;characterized in that it comprises the preliminary step of premixing said starch with said at least one lipid.

15. Process for the production of a biodegradable low-density expanded shaped product according to any of the claims 10 to 13, comprising the steps of:
 - mixing 96-99 parts in weight of a starch with 0.2-2 parts of at least a weak acid or hydrochloric acid and 0.5-2 parts of at least a lipid chosen among the group comprising: peanut oil, maize oil, palm oil and mixtures thereof, thus obtaining an homogeneous mixture, said starch incorporating an amount of amylose comprised between 18% and 43% in weight on the total weight thereof;
 - submitting to gelation said mixture by means of mechanical working in an extrusion chamber of an extrusion device at a pre-established pressure;
 - extruding said gel-like mixture through a die of a prefixed shape, thus obtaining a low-density expanded product.

17. Use of a lipid as amylose protecting-agent in a starch-based composition for the production of biodegradable products, to prevent excessive dextrinization of amylose and recrystallization of starch.

18. Use of a lipid as damp protecting-agent in a starch-based composition for preventing penetration of humidity into the inside of a biodegradable product obtainable by said composition and its degradation."

Claims 2 to 7, 9, 11 to 13, and 16 were dependent claims.

II. On 4 February 2000, a Notice of Opposition was filed by Novamont S.p.A in which revocation of the patent in its entirety was requested on the grounds of lack of novelty and lack of inventive step (Article 100(a) EPC), and extension of subject-matter (Article 100(c) EPC).

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

D1: EP-A-0 282 451;

D2: WO-A-9208759;

D4: Kirk-Othmer Encyclopaedia of Chemical Technology,
Vol. 9, 1980, pages 798, 804 and 805;

D5: Table of Unichema International;

D6: EP-A-0 512 589;

D7: US-A-5 252 271;

D8: US-A-4 076 846;

D9: EP-A-0 087 847;

D10: EP-A-0 409 783;

D11: P. Colonna et al "Macromolecular Modifications of Manioc Starch Components by Extrusion-Cooking with and without Lipids"; Carbohydrate Polymers, Vol.3, 1983, pages 87-108; and

D13: WO-A-9001043.

III. By a decision announced orally on 9 January 2002 and issued in writing on 18 February 2002 the Opposition Division held that the grounds of opposition did not prejudice the maintenance of the patent in amended form.

IV. The decision of the Opposition Division was based on Claims 1 to 19 as submitted during the oral proceedings of 9 January 2002 as main request, and on Claims 1 to 18 as submitted during the oral proceedings of 9 January 2002 as auxiliary request.

Claims 1 to 19 of the main request differed from Claims 1 to 19 as granted:

(i) in that the expression "the group comprising" had been replaced by the expression "the group consisting of" in independent Claims 1 and 15;

(ii) in that independent Claim 17 read as follows:

"Use of a lipid as amylose protecting-agent to be added to a starch-based composition comprising a weak acid or hydrochloric acid for the production of biodegradable products, to protect the amylose molecules against the hydrolytic attack by the weak acid or the hydrochloric acid, to prevent

excessive dextrinization of amylose and recrystallization of starch,
- the starch, being in an amount comprised between 96% and 99% in weight, said starch incorporating an amount of amylose comprised between 18% and 43% in weight on the total weight thereof;
- the weak acid or hydrochloric acid being in an amount comprised between 0.2% and 2% in weight;
the lipid being in an amount comprised between 0.5% and 2% in weight; the above percentages being based on the total weight of the composition.",
and

(iii)in that independent Claim 18 read as follows:

"Use of a lipid as damp protecting-agent to be added to a starch-based composition comprising a weak acid or hydrochloric acid for the production of biodegradable expanded products, in order to prevent penetration of humidity into the inside of said products and their degradation,
-the starch, being in an amount comprised between 96% and 99% in weight, said starch incorporating an amount of amylose comprised between 18% and 43% in weight on the total weight thereof;
-the weak acid or hydrochloric acid being in an amount comprised between 0.2% and 2% in weight;
the lipid being in an amount comprised between 0.5% and 2% in weight; the above percentages being based on the total weight of the composition."

Claims 1 to 18 of the auxiliary request differed from the main request in that Claim 17 thereof had been deleted and in that the remaining claims had been accordingly renumbered.

- V. The decision held that the set of Claims of both the main and the auxiliary request met the requirements of Article 123(2) and 123(3) EPC.

It further stated that the subject-matter of Claim 17 of the main request was novel over document D2, since this document only taught to use lipids to increase the lubricity of the foam and to retard the evaporation of water, but lacked inventive step since document D11 suggested adding a lipid to limit the macromolecular degradation of starch.

Thus the Opposition Division rejected the main request.

Concerning the auxiliary request, the decision held that the subject-matter of Claims 1 and 15 was novel over document D1 and D2, since these documents did not disclose the use of a lipid selected from peanut oil, maize oil, palm oil or mixtures thereof.

Concerning the assessment of inventive step of the subject-matter of Claims 1 to 16, D2 was considered as the closest state of the art. Starting from D2, the technical problem was seen as to provide a starch based composition capable of resisting to the attack of humidity in the long run. This problem was solved by using a lipid selected from peanut oil, maize oil, palm oil or mixtures thereof. D2 itself could not lead to the solution proposed, since the properties of the

product of D2 in terms of resiliency and retardation of water evaporation were mostly due to the presence of a gum in the starch composition and since it taught to carry out a flash drying in order to harden the foam surface and to limit the water absorption. According to the decision, none of the documents D6, D7, D8 and D9 would provide a hint to this solution. Thus, the Opposition Division came to the conclusion that the subject-matter of Claim 1, and by way of consequence that of Claims 2 to 16 was based on an inventive step.

Concerning Claim 17, its subject-matter was considered as novel over D2. D2 was also seen as the closest prior art. Starting from D2, the technical problem was defined as to provide a way of preventing penetration of humidity into the inside of a starch expanded product and its degradation. The solution according to Claim 17 i.e. to add a lipid in the starch composition was not suggested by the documents D6 or D13. Thus, the subject-matter of Claim 17 and of dependent Claim 18 was inventive.

VI. A Notice of Appeal was filed on 12 April 2002 by the Appellant (Opponent), with simultaneous payment of the prescribed fee. It was requested that the decision under appeal be set aside and the European Patent No. 669 369 be revoked.

With the Statement of Grounds of Appeal filed on 18 June 2002, the Appellant submitted a new document referred to as D15 (EP-A-0 474 095).

It also argued essentially as follows:

(i) Concerning novelty of the subject-matter of Claim 1:

(i.1) Claim 1 referred to a mixture of peanut oil, maize oil and palm oil.

(i.2) These oils as shown by documents D4 and D5 were mixtures of C12 to C18 triglycerides.

(i.3) Thus, the lipid component was any mixture of triglycerides. Starch compositions comprising mixtures of triglycerides were however known from D1 (page 1, lines 51 to 54) and D2 (page 1, lines 12 to 16).

(i.4) The fact that the lipid might contain traces of compounds which were characteristic of the specific oils and which, in principle, could be identified by analytical techniques was not relevant for the assessment of novelty. In that respect reference was made to the decision T 205/83.

(i.5) If the novelty was acknowledged on the basis of the presence of trace amounts of compounds which were not identified in the claim or in the description, this would lead to an unacceptable burden for third parties willing to use commercially available triglycerides compositions.

(ii) Concerning inventive step of the subject-matter of Claim 1:

(ii.1) Document D2 might be regarded as the closest state of the art.

(ii.2) It taught to use a lipid to retard the evaporation of water from the starch composition, i.e. the transfer of moisture.

(ii.3) In that respect, the same mass transfer coefficient would apply for the penetration of humidity as for the evaporation of water.

(ii.4) Thus, the problem of penetration of humidity had already been solved by D2. Consequently, the technical problem could only be seen in providing alternative lipids to those proposed in D2 (for example soybean oil).

(ii.5) In that respect soybean oil only differed from maize oil in the content of linolenic acid. It had further be shown by the experimental results submitted with letter of 6 December 2001, that the products obtained while using soybean oil had the same properties in terms of density, compressibility and resilience as those obtained while using maize oil.

(ii.6) Thus, the subject-matter of Claim 1 could not represent an inventive selection.

(ii.7) Furthermore, the conclusion of the Opposition Division that Claim 1 of the auxiliary request involved an inventive step was contradictory to its findings that Claim 17 of the main request was not inventive.

(ii.8) The statement of the Opposition Division that the gum was an essential component of the compositions of D2 was also not correct, since the gum was merely an optional component.

(ii.9) In view of document D6 it would have been expected that edible oils would increase the moisture resistance of starch product. The fact that D6 related to press moulded product was not relevant, since Claim 1 did not contain any process features.

(ii.10) Document D15 taught the use of oils or fats into starch before extrusion in order to increase the resistance against water. The choice of the oils according to Claim 1 was within the capacity of the person skilled in the art without inventive activity.

(iii) For the same reasons as indicated for Claim 1, independent Claim 15 would lack inventive step.

(iv) Independent Claim 14 did not refer to the composition of Claim 1. It lacked inventive step in view of the combination of D2 with D11.

(v) Use claim 17 lacked inventive step in view of D2, since the use of a lipid in D2 was based on the same technical effect contemplated by Claim 17. One would come to the same conclusion in view of D15.

VII. The arguments submitted by the Respondent with its letter dated 24 December 2002 can be summarized as follows:

(i) Concerning the novelty of the subject-matter of Claim 1:

(i.1) Each of the oils of the lipid component according to Claim 1 contained a specific sterol fraction, which could be detected by analytical methods.

(i.2) The decision T 205/83 did not apply, since these sterols were not impurities.

(ii) Concerning inventive step of the subject-matter of Claim 1:

(ii.1) The technical problem to be solved was the provision of a starch based composition capable of resisting to humidity in the long run.

(ii.2) Document D2 would clearly lead away from the solution of the technical problem since it taught to use a flash drying to reduce the water evaporation.

(ii.3) Documents D7 and D8 also taught other ways of obtaining resistance towards humidity and the products of D6 were of totally different nature.

(ii.4) Furthermore, and contrary to the arguments of the Respondent, the presence of a gum in the compositions of D2 was an essential feature.

(ii.5) Document D15 was not pertinent, since it related to packaging materials, which under specific circumstances should resist to the water released by the foodstuffs they contained. The resistance against

water mentioned in D15 could not be interpreted as resistance against the attack of humidity.

(iii) Concerning Claim 14:

(iii.1) Document D1 should be considered as the closest prior art.

(iii.2) Document D1 failed to disclose the step of premixing the lipid with the starch.

(iii.3) This premixing step prevented the dextrinization and the recrystallization of the starch during the extrusion in the presence of the acid.

(iii.4) Document D11 taught that the degradation of starch could be reduced by adding a lipid to the starch during extrusion in the absence of an acid and was totally silent on the prevention of the recrystallization of the starch.

(iii.5) However, the chemical mechanism of the fragmentation of the amylose chain in presence of an acid was totally different. Thus, D11 could not provide any useful teaching for modifying the process of D1 in such a way to arrive at the process according to Claim 14.

VIII. With its letter dated 27 October 2003, the Respondent maintained its main request and submitted 6 auxiliary requests and with a letter dated 19 November 2003 it filed 3 further auxiliary requests.

IX. At the oral proceedings held on 26 November 2003, the discussion was focussed on the admissibility of the document D15, submitted by the Appellant with the Statement of Grounds of Appeal, into the appeal proceedings under Article 114 EPC.

(i) The arguments presented by the Appellant might be summarized as follows:

(i.1) Document D15 had been submitted with the Statement of Grounds of Appeal filed on 18 June 2002. The Respondent had therefore had enough time to study this document.

(i.2) Although D15 had, in fact, been cited in the European search report, its relevance became evident to the Appellant only in view of the arguments set out in the decision of the Opposition Division concerning the assessment of inventive step of the subject-matter of Claim 17 of the auxiliary request in respect of documents D2 and D6.

(i.3) In that connection, document D15, which in particular dealt with the improvement of the water resistance of extruded starch containing articles by incorporating oil or fats therein, would constitute the closest state of the art.

(ii) The Respondent, by contrast, argued strongly that D15 was not of sufficient weight to be admitted at this late stage of the proceedings. In support of this, it stressed

(ii.1) that document D15 disclosed neither the kind of starch (i.e. amylose content), nor the amount thereof in the composition,

(ii.2) that D15, although also referring to the use of an acid, taught to use it for an opposite purpose (i.e. crosslinking) to the one underlying the use of the acid in the patent in suit (i.e. dextrinization),

(ii.3) that D15 only related to the resistance to water in liquid form and not to the resistance to damp as in the patent in suit, and that this would imply that the extruded articles of D15 could exhibit greater pores sizes than those required to resist to the penetration of damp and,

(ii.4) therefore, that D15 could not be considered to be more relevant than any of the other citations already on file.

- X. The Appellant maintained its request that the decision of the Opposition Division be set aside, and the patent be revoked.

The Respondent requested that the appeal be dismissed, and the patent be maintained on the basis of main request corresponding to the set of claims 1 to 18 submitted as auxiliary request at the oral proceedings of 9 January 2002, or in the alternative on the basis of one the auxiliary requests filed with the letter dated 27 October 2003 and with the letter dated 19 November 2003; further in the event that document D15 (EP-A-0 474 095) be admitted to the proceedings,

that the case be remitted to the first instance and that an apportionment of costs be made in favour of the Respondent.

Reasons for the Decision

1. The appeal is admissible.
2. Admissibility of document D15 into the proceedings.
 - 2.1 As stated in decision T 117/86 (OJ EPO 1989, 401) facts and evidence in support of an opposition which are presented after the nine-month period has expired are out of time and late, and may or may not be admitted into the proceedings as a matter of discretion under Article 114(2) EPC.
 - 2.2 Since the grant of the European Patent EP 0 669 369 was announced on the 6 May 1999, the nine-month ended therefore on the 7 February 2000.
 - 2.3 As indicated above in paragraph V, document D15 was submitted by the Appellant with the Statement of Grounds of Appeal, i.e. on the 18 June 2002. Furthermore, the fact that this document had been cited in the European search report, does not imply that it automatically forms part of the opposition or appeal proceedings (cf. T 291/89 of 14 May 1991, not published in OJ EPO, point 3 of the reasons).
 - 2.4 It thus follows that document D15 must be regarded as late filed.

- 2.5 According to the decision T 1002/92 (OJ EPO 1995, 605, point 3.4 of the reasons) late filed evidence should only be admitted at the appeal stage, if it can be considered at first sight to be more relevant than the evidence relied on at first instance and to be highly likely to prejudice the maintenance of the patent.
- 2.6 In the present case, the Board observes that the late filed document D15 refers to the extrusion of low density expanded products from compositions comprising a starchy component and an acid (cf. Claims 1, 4, 5, 11) and teaches that oils or fats might be incorporated in the composition to improve their water resistance (cf. column 3, lines 19 to 35; Claim 9). Thus, D15 appears *prima facie* to come closer to the subject-matter of Claim 17 of the main request than documents D2, D6, and D13 referred to in the decision under appeal in that respect.
- 2.7 The Board, however, refrains from commenting the submissions of the Respondent concerning the relevance of document D15 (cf. points IX (ii.1), (ii.2) and (ii.3) above), and deliberately leaves open the question whether D15 is highly likely to prejudice the maintenance of the patent, since this might risk prejudicing the first instance consideration which is ordered below.
- 2.8 Nevertheless, for the reasons given above (cf. point 2.6), document D15 is, in the Board's opinion, sufficiently relevant in relation to the issue of inventive step to be admitted into the proceedings.

3. *Remittal*

Taking into consideration that the new document D15 amounts to a fresh case against the patent in suit, and having regard to the request of the Respondent for remittal to the first instance, the Board considers it appropriate to make use of its discretionary powers under Article 111(1) EPC and to remit the case to first instance for further prosecution (see T 223/95, not published in the OJ EPO, point 5 of the reasons).

4. *Apportionment of costs*

4.1 According to the board of appeal case law, if a party introduces important facts or evidence at a late stage of proceedings, without cogent reasons for the delay, this might be taken into account in the apportionment of costs. If, however, the reason for the late citing does not point towards negligence or other circumstances that would amount to an abuse of procedure, there would be no reason of equity which would justify an apportionment of costs in the other party's favour (cf. Case Law of the Boards of Appeal of the European Patent Office, 4th Edition, 2001; point VI.F.8; pages 336-337).

4.2 In this connection, in the decision T 1063/98 of 3 July 2001 (not published in OJ EPO point 2 of the reasons) the Board in charge of that case, having considered that the *ratio decidendi* of the Opposition Division was that the documents then on file did not disclose a specific prepolymerization step, came to the conclusion that the late filing of two documents which did describe such a prepolymerization step, could be seen

as a reaction to that decision, and thus did not represent an abuse.

4.3 In the present case, the Opposition Division has, in substance, considered in its decision that none of the documents D2, D6 and D13 could challenge the inventive step of the subject-matter of Claim 17, since D2 made no relation between penetration of humidity and the use of lipid, since document D6 did not relate to extruded articles and since D13 taught to use the lipid only as a coating for the starch composition.

4.4 It is therefore clear in view of the disclosure of D15 (cf. point 2.6 above) that the filing of this document can be seen as a reaction to the decision of the Opposition Division. According to the Board, it is justified that a party which has lost in the opposition proceedings tries during the appeal proceedings to fill a presumed missing link in order to improve its position with respect to the issue of inventive step. Furthermore, the introduction of document D15 took place at the earliest possible moment, namely at the beginning of the appeal proceedings.

4.5 Consequently, the filing of the document D15 by the Appellant in the appeal proceedings is, in the Board's opinion, legitimate and does not represent unfair behaviour. It cannot therefore be considered as amounting to an abuse of procedure.

4.6 Hence, there is no reason for a deviation from the general principle set out in Article 104(1) EPC.

4.7 The Respondent's request for an apportionment of costs must therefore be rejected.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. Document D15 is admitted into the proceedings
3. The case is remitted to the first instance for further prosecution.
4. The request for apportionment of costs is refused

The Registrar:

The Chairman:

E. Görgmaier

R. Young