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Datasheet for the decision of 4 October 2010

Case Number: T 0838/07 - 3.3.03

Application Number: 96920247.2

Publication Number: 0830379

IPC: C08B 30/14

Language of the proceedings: EN

Title of invention:
Thermally-inhibited pregelatinized non-granular starches and flours and process for their production

Patentee:
BRUNOB II B.V.

Opponent:
Cerestar Holding B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (main request): yes, non obvious combination"
"Late-filed document not admitted into the proceedings: no good reason justifying the late filing; document not prima facie relevant"

Decisions cited:
T 1002/92

Catchword:
-

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Case Number: T 0838/07 **-** 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 4 October 2010

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office dated 7 March 2007 and posted 7 May 2007 rejecting the opposition filed against European patent No. 0830379 pursuant to Article 102(2) EPC 1973.

Composition of the Board:

Chairman: R. Young
Members: O. Dury
C. Vallet

Summary of Facts and Submissions

I. The mention of the grant of European patent No. EP-B-0 830 379, based on application 96920247.2, filed on 16 May 1996 in the name of National Starch and Chemical Investment Holding Corporation and further transferred to Brunob II B.V. was published on 13 August 2003 in Bulletin 2003/33.

II. In the present decision, "EPC" refers to the revised text of the EPC 2000, the previous version is identified as "EPC 1973". Besides, any reference to passages in the patent in suit as granted will be given underlined in squared brackets, e.g. [claim 1].

III. The granted patent was based on [16 claims], wherein the sole independent claim read as follows:

"1. A process for preparing a thermally-inhibited, pregelatinized non-granular starch or flour which is substantially free of off flavors, which comprises the separate steps of:

- removing proteins, lipids, and/or other off flavor components from a starch or a flour;
- pregelatinizing a starch or a flour using a process which disrupts the granular structure; and
- thermally inhibiting a starch or a flour by dehydrating, thermally or non-thermally, a starch or a flour to anhydrous or substantially anhydrous and then heat treating the dehydrated starch or flour at a temperature and for a period of time sufficient to thermally inhibit the starch or the flour."

[Claims 2-16] were dependent claims directed to elaborations of the process of claim 1.

IV. Notice of opposition against the patent was filed by Cerestar Holding B.V. on 11 May 2004 on the grounds of Art. 100 (a) EPC (lack of inventive step) and Art. 100 (b) EPC. The opposition was substantiated, *inter alia*, on the following documents:
D2: US-A-4 477 480

V. The opponent further filed document **D5** (WO 95/04082) on 18 August 2005.
In its submission of 11 September 2006, the patent proprietor requested that **D5** should not be admitted into the proceedings because it was late filed, i.e. after the nine months opposition time limit, and not relevant.

VI. In its decision announced at the end of the oral proceedings held before the opposition division on 7 March 2007 and issued in writing on 7 May 2007 the opposition division rejected the opposition.

The opposition division considered that the objections raised by the opponent in relation with an alleged lack of disclosure according to Art. 83 EPC were rather a matter of clarity according to Art. 84 EPC. According to the contested decision, the skilled person was, however, in a position to carry out the invention, in particular on the basis of the information provided in the examples of the patent in suit. The opposition division rejected the objection of the opponent that the skilled person faced an undue burden to repeat the invention.

The opposition division further considered that **D5** was *prima facie* relevant and, following decision T 1002/92 (published in OJ EPO 1995, 605), decided to admit it into the proceedings.

Finally, an inventive merit was acknowledged starting from either **D5** or **D2** as closest prior art. The opposition division decided in particular that the combination of the teaching of **D5** and **D2**, which could have led to the subject matter claimed by the patent in suit, was not obvious (could/would approach).

VII. Notice of appeal against the decision of the opposition division was filed on 19 May 2007 by the opponent with simultaneous payment of the prescribed fee. The opponent, now appellant, requested that the contested decision be set aside and the patent be revoked in its entirety because it was insufficiently disclosed (Art. 83 EPC) and lacked an inventive merit (Art. 56 EPC).

The statement of grounds of appeal was received on 7 September 2007 and was substantiated *inter alia* on documents **D2** and **D5**, which both formed part of the opposition proceedings. In addition, the appellant cited for the first time the following documents and requested their admission into the proceedings:
D23: "Handbook of Water-Soluble Gums and Resins", Edited by Robert L. Davidson, 1980, Chapter 22, Starch and its Modifications, pages 22-1 to 22-83
D24: EP-B1-0 108 833
D25: US-A-5 246 718

Regarding these documents, the following submissions were made:

- **D23** represented common general knowledge and was filed because it seemed that, in the contested decision, the opposition division had misused several technical terms which were crucial for a correct understanding of the subject matter claimed in the patent in suit and in the prior art;
- **D24** was *prima facie* relevant and was actually lying closer to the claimed invention than either **D2** or **D5**;
- **D25** was filed in order to demonstrate that the off flavours removing step defined in [claim 1] was known to the person skilled in the art before the priority date of the contested patent.

The objection regarding an alleged lack of sufficient disclosure pursuant to Art. 83 EPC which had been cited in the notice of appeal was, however, not further elaborated upon in the statement of grounds of appeal.

The appellant submitted the following objections related to the lack of inventive merit considering that any of **D2**, **D5** or **D24** could be regarded as closest prior art:

- The processes claimed only differed from **D24** as closest prior art in that they comprised an additional off flavours removal step. Such a treatment was, however, already known in the art e.g. from **D25** and/or **D23**, rendering the process claimed obvious since it amounted to the mere combination of the teachings of **D24** with either **D25** or **D23**;
- The processes claimed amounted to the obvious combination/juxtaposition of the processes of thermal inhibition according to **D5** with two

additional processes, namely an off flavours treatment and a pregelatinisation, which were both well known in the art as taught in **D23** and **D25**;

– **D23** showed that it was obvious to combine the processes taught in **D2** as closest prior art (off flavour treatment combined with a pregelatinisation step) with that of **D5** (thermal inhibition).

VIII. In its reply to the statement of grounds of appeal dated 31 March 2008, the patent proprietor, now respondent, requested that the appeal be dismissed and the patent be maintained unamended (main request) or, alternatively, in its amended form according to any of auxiliary requests 1-4 filed therewith.

The respondent requested not to admit into the proceedings each of the late filed documents **D23**, **D24** and **D25** and, should any one of this document be admitted, that the case be remitted to the first instance. The respondent submitted that the late filing of **D24** amounted to an abuse of the proceedings because this document was well known to the appellant, who had already filed it in connection with the opposition proceedings against the divisional of the patent in suit with a letter dated 7 July 2005. Hence, the appellant could have filed **D24** much earlier in the proceedings.

The respondent further filed the following documents to support its argumentation related to the inventive step:
D26: Statutory declaration of Karen G. Kaiser and James P. Zallie, dated 18 October 2007;
D27: First declaration of Mr. Kasica: comparative experiments related to **D5**;

D28: Second declaration of Mr. Kasica: comparative experiments related to example I of **D24**.

In this respect, the respondent submitted the following arguments:

- It was established in the art that granular and non-granular starches were structurally different products having significantly different properties and functions. Hence, the combination of **D2**, which concerned non-granular starches, and **D5**, which was directed to granular starches, would not have been considered by the skilled person and was, thus, not obvious;
- The teaching of **D23** did not represent an incentive to combine **D2** and **D5**, as argued by the appellant;
- **D27** showed that the starches obtained by the process of the patent in suit produced superior food products (white sauces) than starches according to **D5**;
- There was no incentive in **D5** and **D23** to combine a pregelatinisation step and an inhibition step as claimed. Besides, since these documents did not disclose an off flavour removal step, their combination could not lead to the subject matter of the unamended patent;
- As shown by the experimental data **D28**, **D24** did not unambiguously disclose a process wherein starch is dehydrated to a moisture content of less than 1 % by weight or less as requested by [claim 1]. Hence, the starches disclosed in **D24** were not thermally inhibited in the sense of the present invention, with the result that the combination of **D24** and **D25** did not lead to the subject matter of [claim 1];

Therefore, the respondent concluded that an inventive merit should be acknowledged since none of the combinations of documents contemplated by the appellant rendered the subject matter claimed obvious.

IX. On 2 July 2010 the board issued a summons to attend oral proceedings and informed the parties of its provisional opinion. The following points were ***inter alia*** mentioned:

- Although the appellant had cited Art. 83 EPC in its notice of appeal, this objection had not been substantiated in its statement of grounds of appeal and had, thus, not been validly raised;
- It would have to be decided during the oral proceedings whether or not documents **D23**, **D24** and **D25**, which had not been presented in the notice of opposition pursuant to Rule 76 (c) EPC (former Rule 55 (c) EPC 1973) in support of the grounds of opposition on which the opposition was based, would be admitted into the proceedings; reference was made to T 1002/92;
- **D24** did not explicitly disclose a dehydration step and/or thermally inhibited/crosslinked starch as defined in the [claims]. The respondent had, however rendered plausible with its comparative data **D28** that examples I and III of **D24** did not disclose that starch was dehydrated to 1 % or less moisture by weight in the sense of paragraph [0011]. It would have to be clarified, however, during the oral proceedings, whether the same conclusions were to be drawn regarding examples II, IV and V of **D24**. In this respect, it was conspicuous that the examples of the contested patent had been performed "using a conventional oven or a dextriniser" (see paragraph

[0048]), using very similar conditions of pH, temperature, and duration of heating than in example II of **D24**;

- The inventive merit would be assessed during the oral proceedings according to the problem-solution approach. The board considered that, among the documents which made part of the opposition proceedings, **D5** could be considered as closest prior art. It would have to be assessed, however, whether or not **D24** could be more relevant than **D5** regarding the determination of the closest prior art.

X. In its submission filed on 1 September 2010, the appellant pointed out that documents **D23**, **D24** and **D25** had been filed as a reaction to issues raised in the contested decision and should, therefore, be admitted into the proceedings.

The appellant presented further arguments related to the objections of lack of inventive step already raised in the statement of grounds of appeal, in particular concerning the following combinations:

- **D24** as closest prior art with either **D2** or **D25**;
- **D2** as closest prior art with **D5**.

XI. In its submission of 6 September 2010 the respondent filed new auxiliary requests 3 and 4 in replacement of former auxiliary requests 3 and 4.

Regarding the inventive merit, the respondent filed further comparative data in order to demonstrate that the starches prepared according to examples II and V of **D24** did not mandatorily achieve a dehydration of starch

to a moisture content of 1 % by weight or less. These data will be referred to as:
D29: Declaration of Mr. Kasica: comparative experiments related to examples II and V of **D24**.

XII. Oral proceedings were held on 4 October 2010 in the presence of both parties.

Initial requests

The **appellant** (opponent) requested that the decision under appeal be set aside and that the European patent No. 830379 be revoked.

The **respondent** (patent proprietor) requested that the appeal be dismissed and the patent be maintained as granted or, alternatively, according to either of the auxiliary requests 1 and 2 filed with the statement of grounds of appeal or 3, 4 filed with the letter dated 6 September 2010.

The following issues were addressed during the oral proceedings:

Inventive step starting from D5 as closest prior art

XIII. Following the problem-solution approach, the appellant considered **D5**, which aimed at providing a starch that when gelatinised exhibited non cohesive properties i.e. a cook-up starch, as closest prior art. Screening example 5 (**D5**: page 5), in particular, specifically disclosed such starches which had been thermally inhibited by dehydrating to a moisture content of less than 1 % by weight.

The appellant first argued that dispersing and gelatinising a starch prepared according to **D5**, as taught e.g. on page 4, lines 1-11 and 15-21 of **D5**, would be equivalent to pregelatinising it as defined in [claim 1]. The skilled person starting from D5 and looking for an off flavours treatment of the thermally inhibited starches disclosed therein would consult **D2**, which explicitly dealt with such a treatment.
Following a second line of argumentation, the appellant submitted that the skilled person knew that an obvious alternative to cook-up starches as prepared in **D5** were instant starches as claimed in the contested patent. Hence, the problem to be solved starting from **D5** could be seen as how to make a pregelatinised starch with reduced off flavours. The appellant submitted that the skilled person aiming at solving this problem would be directed to **D2** which provided an off flavours treatment of granular starches (see col. 2, lines 1-15) which included an optional pregelatinisation step (col. 3, lines 13-19).
The appellant explained that the combination of **D5** and **D2** would be contemplated by the skilled person because **D2** taught explicitly that the process disclosed therein could be done on any starch (**D2**: col. 1, lines 5-10; col. 1, line 65 to col. 2, line 1) and could also be carried out on a modified starch (**D2**: col. 3, lines 26-31). According to the appellant, such modified starch encompassed inhibited i.e. crosslinked starches according to **D5**. The combination of **D5** and **D2** would, thus, obviously lead to a process as recited in [claim 1].

XIV. The respondent agreed that **D5** was the closest prior art but contested that the combination of **D5** and **D2** would

be obvious. The main reason was that these two documents were directed to starches having significantly different structures, properties and functions. Whereas **D5** was directed to granular starches which were crystalline, insoluble, non functional, non homogeneous and needed cooking when used, **D2** was concerned with non-granular starches which were amorphous, soluble, functional, homogeneous and did not need cooking. Hence, the skilled person starting from **D5** would have had no good reason, without knowing the subject matter claimed in the patent in suit, to go to **D2** (could/would approach; hindsight).

The respondent further pointed out that **D5** nowhere mentioned a process dealing with inhibited and pregelatinised starches: the single reference to pregelatinised starches was on page 12, lines 6-11 but only concerned the optional use of such starches as additional component to be blended with starches inhibited according to the teaching of **D5**.

The respondent indicated that the heat treatment disclosed on page 12, lines 12-14 (pasteurisation, retorting) would also not be equivalent to a pregelatinisation.

Finally, the respondent pointed out that the inhibition step taught in **D5** amounted to the crosslinking of starches, which prevented the opening of the starch granules. The process of **D2**, however, was precisely based on the breaking up of the starch granules. Hence, the teaching of both documents related to diametrically opposite processes and would, thus, not be combined in an obvious manner.

Admissibility of D24 into the proceedings

XV. The appellant contemplated to base another objection regarding a lack of inventive step starting from **D24** as closest prior art. The respondent, however, resisted the request of admitting **D24** into the proceedings.

XVI. The respondent argued that the appellant had started the assessment of the inventive step by considering **D5** as closest prior art, which was correct since **D24** was more remote from the invention that **D5**. Indeed, as shown by the respondent with its comparative data **D27** and **D29**, **D24** did not disclose either implicitly or explicitly a thermal inhibition in the sense of the granted patent. The appellant had, thus, failed to demonstrate that the processes disclosed in **D24**, in particular in any of its examples, inevitably comprised and/or implicitly disclosed a thermal inhibition step as defined in [claim 1]. As a consequence, the appellant had not discharged its burden of proof in this regard. The respondent, thus, concluded that **D24** should not be admitted into the proceedings because it was late filed, it was not *prima facie* relevant and it did not come closer to the invention than **D5**.

XVII. The appellant submitted that **D24** dealt, like the patent in suit, with instant gelling, non-chemically modified starches usable in food.
Besides, the appellant considered that the comparison of example I-J-4 of **D24** with [example 1] (paragraphs [0055]-[0056]) performed on tapioca starch which was heat treated at 140°C for 2-8 hours, showed that when the same conditions were used, similar gels were

obtained. This implicitly showed that the same reactions took place.

The appellant admitted that **D24** did not explicitly disclose that starch was dehydrated to less than 1 % by weight. However, the patent in suit taught that the heat treatment and the inhibition could take place together (see e.g. [examples 1-2]). Besides, in the examples of the patent, starch was dehydrated under similar conditions than in **D24**. Finally, according to paragraph [0034], it was clear that during the processes claimed starches could be degraded by hydrolysis. On the basis of these considerations, the appellant concluded that **D24** disclosed the same steps of pregelatinisation and thermal inhibition as defined in [claim 1] and that the subject matter claimed only differed from **D24** in the additional off flavours treatment. Hence, **D24** was indeed ***prima facie*** relevant and closer to the invention of the patent in suit than either **D2** or **D5**. Although it was admittedly late filed, **D24** should nevertheless be admitted into the proceedings because it could lead to the revocation of the patent.

XVIII. Questioned by the Chairman of the board, the appellant stated that there was no particular reason why **D24** had been filed late. It was obviously a mistake and the late filing had by no means been intentional.

XIX. After deliberation the Chairman of the board announced that **D24** was not introduced into the proceedings.

XX. As a consequence, the appellant withdrew its request that **D23** and **D25** be admitted into the proceedings.

Sufficiency of disclosure: Art. 83 EPC

XXI. The appellant withdrew its objection pursuant to Art. 83 EPC with regard to the main request of the respondent.

Final requests

The **appellant** (opponent) requested that the decision under appeal be set aside and that the European patent No. 830379 be revoked.

The **respondent** (patent proprietor) requested that the appeal be dismissed and the patent be maintained as granted or, alternatively, according to either of the auxiliary requests 1 and 2 filed with the statement of grounds of appeal or 3, 4 filed with the letter dated 6 September 2010.

XXII. The board announced its decision at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Although the appellant originally requested in its notice of appeal the revocation of the patent because it did not disclose the invention in a manner sufficiently clear and complete for it to be carried out (Art. 83 EPC), this objection was never

substantiated during the appeal proceedings and was eventually withdrawn, at least with regard to the main request, during the oral proceedings (see section XXI). The board, thus, does not need to consider this objection.

3. Identification of the subject matter of the patent in suit and of the relevant documents of the prior art

3.1 Patent in suit

The patent in suit deals with a process for preparing a thermally-inhibited, pregelatinised non-granular starch or flour which is substantially free of off flavours and which comprises the separate steps of:

- A) removing proteins, lipids, and/or other off flavour components from a starch or a flour;
- B) pregelatinising a starch or a flour using a process which disrupts the granular structure; and
- C) thermally inhibiting a starch or a flour by
  - C1) dehydrating, thermally or non-thermally, a starch or a flour to anhydrous or substantially anhydrous and then
  - C2) heat treating the dehydrated starch or flour at a temperature and for a period of time sufficient to thermally inhibit the starch or the flour.

Any reference to steps A, B, and/or C given in the present decision refers back to the steps of off flavours treatment, pregelatinisation and thermal inhibition, respectively, hereby identified.

According to the wording of [claim 1], steps A, B and C may be performed in any sequence. Besides, steps C1 and C2 may be accomplished in a single apparatus (e.g. conventional ovens, dextrinisers, microwave ovens, fluidised bed reactors and driers), optionally in a continuous manner (see paragraph [0042] and the [examples]).

3.2 Document **D5**

D5 deals with a process for making starch/flour having the viscosity and textural characteristics of a chemically crosslinked starch but without the use of chemical reagents and further aims at providing starch usable in the food industry, i.e. which have to exhibit good organoleptic properties as assessed in its example 7 (Tables IX and X on pages 28-33). The process disclosed in claim 1 of **D5** reads as follows:

"1. A process for making a heat treated starch that is noncohesive when dispersed in an aqueous medium and gelatinized comprising the steps:

(a) providing a native granular starch at a neutral or basic pH;

(b) dehydrating the starch to a moisture content of 5 % or less; and

(c) heating the dehydrated starch at a temperature of 100 °C or greater for a period of time effective to cause the starch to be noncohesive when it is dispersed in an aqueous medium and gelatinized, the heat treated starch being the functional equivalent to a chemically crosslinked or modified starch."

According to page 5, lines 1-2 of **D5** the term "native" means "a starch that has not been chemically crosslinked, modified or treated in any way". **D5** further teaches that starch should preferably be dehydrated to a moisture content as low as 3 % or less, most preferably 1 % or less before the heating step (page 9, line 22 to page 10, line 2). Screening examples 5 and 6 (**D5**: pages 25-26) explicitly disclose starches according to the above process and which have been dehydrated to less than 1 % moisture and then heated in a fluidised bed reactor.

Hence, **D5** discloses a process leading to the provision of inhibited starch corresponding to step C and comprising both phases C1 and C2 as above defined.

The board considers in particular that **D5** does not disclose a step of pregelatinising starch (step B). The board, in this regard, disagrees with the appellant that dispersing and gelatinising a starch prepared according to **D5** would be equivalent to pregelatinising it as defined in [claim 1]. Indeed, whereas gelatinising refers to swollen starch granules which may or may not have lost their granular structure (see paragraph [0003]), the pregelatinisation step defined in [claim 1] requires the disruption of the granular structure of the starch. The board considers, thus, that the process step of pregelatinisation defined in [claim 1] is not disclosed in **D5** and that there is also no evidence on file supporting the argument of the appellant that dispersing and gelatinising a starch prepared in **D5** modifies starch in the same manner as a pregelatinisation step.

Besides, as acknowledged by the respondent, the only explicit reference made to pregelatinised starch with regard to the processes taught in **D5** is found on page 12, lines 9-11, which indicates that starch according to **D5** may optionally be blended with pregelatinised starch in order to prepare food products. Hence, this passage does not refer to the pre- or post-modification of starches prepared according to the teaching of **D5** but to the mere preparation of starch blends.

Finally, the board agrees with the respondent that the heat treatment processes of the starches prepared in **D5** which are disclosed on page 12, lines 12-14 (namely pasteurisation or retorting) are not equivalent to "pregelatinising a starch or a flour using a process which disrupts the granular structure" as defined in [claim 1]. There is in particular no evidence on file that such a treatment would inevitably lead to a destruction of the granular structure of the inhibited starch prepared according to the teaching of **D5**. The argument of the appellant in this respect is, thus, rejected.

Hence, the board considers that **D5** discloses a process for preparing granular starches, said process comprising an inhibition step according to step C as above defined. **D5**, however, fails to disclose two of the steps recited in [claim 1], namely the off flavours removal step and the pregelatinisation step (steps A and B, respectively).

3.3 Document **D2**

D2 discloses a process for removing off flavours from cereal starch, said process comprising a step of washing with alkali followed by drying using e.g. a pregelatinisation process (see **D2**: claims 1, 4, 10, 11; col. 3, lines 13-20; examples). The processes disclosed in the examples of **D2**, indeed, all comprise a drum drying step which leads to pregelatinised starches. **D2**, thus, discloses processes for treating starch and comprising two of the steps defined in [claim 1], namely:

- a washing step corresponding to the claimed off-flavours removal step (step A); and
- a pregelatinisation step (step B).

In addition, **D2** teaches that the starch prepared according to such a process may be further modified by any conventional physical or chemical means (col. 3, lines 26-29). **D2**, however, fails to disclose a thermal inhibition step as defined in [claim 1] (step C).

3.4 Late filed documents

The appellant and the respondent disputed during these proceedings whether or not documents **D23**, **D24** and **D25** should be admitted into the appeal proceedings. The appellant had in particular contemplated using **D24** as an alternative to **D5** as closest prior art for the assessment of the inventive merit. The board has, thus, to take a decision on this issue.

3.5 Document **D24**

It is established that **D24** was cited for the first time during the appeal proceedings and that it had, thus, not been presented in the notice of opposition pursuant to Rule 76 (c) EPC (former Rule 55 (c) EPC 1973) in support of the grounds of opposition on which the opposition was based. According to the EPO case law, in proceedings before the boards of appeal, such late filed documents should only very exceptionally be admitted into the proceedings in the appropriate exercise of the board's discretion, if such new material is ***prima facie*** highly relevant in the sense that it can reasonably be expected to change the eventual result and is thus highly likely to prejudice maintenance of the European patent" (see e.g. point 2 of the headnote of T 1002/92).

In addition to this criterion which had to be evaluated in order to decide whether or not **D24** could be admitted into the proceedings, the board also ascertained whether or not there were any good reasons which would have justified said late filing of **D24**.

3.5.1 No good reason justifying the late filing of **D24**

During the oral proceedings before the board, the appellant admitted that there was no good reason which could explain why **D24** had been filed so late.

In addition, as pointed out by the respondent, it was established during the appeal proceedings that the appellant had been well aware of the existence of **D24** and of its possible relevance for the subject matter of

the patent in suit at least about two years before this document was eventually cited for the first time in the present proceedings, namely on 7 September 2007 (i.e. date of filing of the statement of grounds of appeal): indeed, **D24** had already been filed by the appellant itself, and actually by the same representative, in the notice of opposition dated 7 July 2005 related to the divisional of the contested patent.

From the facts at its disposal, the board is not in a position to evaluate whether or not the late filing of **D24** in the current proceedings amounted to a mere mistake - as argued by the appellant during the oral proceedings before the board - or a deliberate intention to abuse the proceedings - as suspected by the respondent in its reply to the statement of grounds of appeal (page 2) -. Nevertheless, upon examination of the facts on file, the board must come to the conclusion, that there was no valid reason which could justify the filing of **D24**, which had been known long ago to the appellant, at such a late stage.

3.5.2 Subject matter disclosed in **D24** - *Prima facie* relevance

D24 deals with the preparation of instant starches for food applications and which are prepared without conversion or chemical modification (**D24**: page 1, lines 3-5, 40-42 and 61-65). It discloses a process wherein a native tapioca or potato starch is pregelatinised and then submitted to a heat treatment at 125-180 °C for 1,5 to 24 hours (**D24**: claim 1; examples). These processes are illustrated in examples I-V, which make use of various heat treatments of the starches, e.g. in a forced-air oven (examples I and III), in a

dextriniser (example II) or a microwave oven (example V).

D24 fails, however, to disclose the off flavours removal step of the process presently claimed (step A as above defined) and does not ***explicitly*** disclose, in particular in its examples I-V, a step of thermal inhibition comprising dehydrating starch to anhydrous or substantially anhydrous as defined in [claim 1] together with paragraph [0011]. During these proceedings, it was in particular disputed by the parties whether or not the heat treatment done in each of the examples I-V of **D24** corresponded to a thermal inhibition as defined in [claim 1] i.e. whether or not this step would be ***implicitly*** disclosed in the examples of **D24**.

In this respect, the board points out that it had made it clear in its communication sent as an annex to the summons to the oral proceedings that this precise issue was at stake in relation to the admissibility of the late filed documents and that it would have to be clarified during the oral proceedings. However, the appellant has never provided any evidence, even in reaction to the communication of the board, to show that such a requirement would have been inevitably met in any of the processes disclosed in **D24**. The board agrees with the respondent that in the absence of any evidence in this regard, the appellant has failed to discharge its burden of proof.

In this regard, the board further considers that **D24** does not disclose that it was the intention of its inventors to fulfil the precondition for inhibition

defined in [claim 1], namely to prepare a starch having a moisture content of 1 % by weight or less. **D24** in particular does not disclose any hint that it aimed at achieving, for any reason, a dehydration of starch at such a low moisture level. There is, thus, no reason to expect that this feature was bound to be achieved or to be implicitly met, in particular in any of examples I-V of **D24**.

Finally, the board agrees with the respondent that, although it did not have the burden of proof, it has nevertheless rendered it plausible on the basis of the comparative data filed in **D28** and **D29** that **D24** did not disclose that starch was inevitably dehydrated to less than 1 % moisture by weight in the sense of the patent in suit. The board is in particular satisfied that the experiments presented in **D28** and **D29** represent a fair repetition of the teaching of **D24** and considers that the following conclusions may be drawn from these data:

- The respondent has rendered it plausible with **D28** that the heat treatment made by placing pregelatinised starch in a "wide mouthed glass jar" "in a forced air electric oven" according to the information derivable from examples I and III of **D24** did not obligatorily lead to a moisture content of 1 % by weight or less;
- The respondent has also demonstrated with its comparative data **D29** that a heat treatment as taught in example II of **D24** did not lead to a moisture content of starch of 1 % by weight or less. Indeed, Example II of **D24** was performed using native tapioca starch drum-dried from a slurry of pH 7 to a moisture content of 2.5 %, which was placed in a dextriniser and held for 4-6 hours at 149°C. It is

true that these conditions appear at first glance to be taught in the patent in suit as being suitable for ensuring the claimed dehydration of starch and its inhibition (see paragraphs [0014]; [0033]; [0042]; [0048]; [examples 1-7 and 9]). The examples of the contested patent for example were also performed "using a conventional oven or a dextriniser" (paragraph [0048]) and using very similar conditions of pH, temperature, and duration of heating than in **D24**. However, the patent specifies in paragraph [0048] that the starch was dehydrated up to a moisture level of "about 0 %", which indicates that specific experimental conditions have been chosen so as to achieve this criterion. The results of **D29** show that these specific experimental conditions have not mandatorily been used in example II of **D24**;

- Example IV of **D24** does not give any information regarding the heat treatment used. Hence, no conclusion can be reached regarding the moisture content of the starch in this example.
- Finally, the respondent has also demonstrated in **D29** that a heat treatment made using a microwave oven as taught in example V of **D24**, although it is taught in the patent as being suitably used (see paragraphs [0014], line 22 and [0042], line 15), did not inevitably lead to a dehydration to a moisture content of 1 % or less.

Hence, the board considers that the processes of preparation of non-granular starches disclosed in **D24** comprise a pregelatinising step (step B as defined in section 3 above) according to [Claim 1] followed by a heat treatment. **D24**, however, neither discloses an off

flavours removing step, nor a thermal inhibition step according to [Claim 1] (corresponding to steps A and C, respectively, above defined).

3.5.3 The board, thus, decides that **D24** is not to be admitted into the proceedings because

- there is no valid reason for justifying its filing at such a late stage of the proceedings;
- **D24**, upon consideration of the evidence on file, only discloses one of the three steps of the process defined in [claim 1] (steps A-C as above identified) and is ***prima facie*** not more relevant than the prior art documents already in the proceedings, in particular **D5** and **D2**;
- it cannot be reasonably expected that **D24** is highly likely to prejudice the maintenance of the patent in suit.

3.6 Documents **D23** and **D25**

During the oral proceedings before the board, the appellant has withdrawn its request to admit into the proceedings documents **D23** and **D25**. These documents, thus, need not be considered in the present decision.

4. Inventive step

The inventive merit is assessed according to the problem-solution approach.

4.1 Closest prior art

The closest prior art for assessing inventive step is a prior art document disclosing subject matter conceived

for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications; A further criterion for the selection of the most promising starting point is the similarity of technical problem (see Case Law of the Boards of Appeal of the EPO, 6th Edition, 2010, I.D.3.1).

The board, thus, considers that among the documents cited by the appellant and which made part of or had been admitted into the opposition proceedings, **D5** represents the closest prior art because it deals, like the patent in suit, with a process for making starch/flour having the viscosity and textural characteristics of a chemically crosslinked starch/flour but without the use of chemical reagents and further aims at providing starch/flour usable in the food industry, i.e. which exhibit good organoleptic properties (**D5**: example 7; Tables IX and X on pages 28-33). Both the appellant and the respondent shared this point of view, at least during the oral proceedings, wherein they both identified **D5** as representing the closest prior art.

The board is aware that, in the written phase of the appeal proceedings, the appellant had also considered **D2** as a suitable closest prior art. However, **D2** does not deal with the main problem addressed by the patent in suit, which is, in the board's view, to provide a process for the preparation of a "clean-labelled" starch having improved properties i.e. an improved starch which can be claimed as a natural product but which has nevertheless the superior properties of a

modified starch. Hence, the board rejects the argument of the appellant that **D2** represented a suitable closest prior art.

4.2 Defining the alleged problem solved in view of the closest prior art **D5**

Normally, the problem addressed in the patent in suit may be taken as the starting point. This problem is identified as being the provision of a process for the preparation of a thermally inhibited starch for food applications and which is in the form of a dry product which has instant gelling properties, is substantially free of off tastes, and which remains "clean-labelled" i.e. non chemically modified (see paragraphs [0008], [0009], [0019] and [0043]).

4.3 The solution

The solution provided by the patent resides in a process comprising steps A, B and C as previously defined i.e. in the combination of a process according to D5 (step C) with two additional steps, namely an off flavours removal treatment (step A) and a pregelatinisation (step B).

4.4 Examination of the success of the solution - objective problem effectively solved

[Examples 1-6] show that the problem identified in section 4.2 is indeed solved by processes defined in [claim 1].
[Example 1] in particular illustrates a process comprising the sequence of steps A→B→C and leads to the

provision of unmodified instant starches having sufficiently high viscosity and low percentage breakdowns in viscosity, which is an indication of thermal inhibition (see paragraph [0043]).
Besides, [examples 2-6], although they do not disclose an off flavours treatment, all show that similar starches may be obtained using various processes comprising either the sequence of steps B→C or C→B. The board considers it plausible, e.g. on the basis of the teaching of paragraph [0020], that these properties would be maintained if the processes of these examples were to be combined with an additional off flavours treatment (step A).
Hence, the board is satisfied that the problem identified above represents the objective problem which was effectively solved.

4.5 Examining whether the proposed solution is obvious with regard to the state of the art

It may be derived from the arguments provided by both parties and from the teaching of **D2** as well as from paragraphs [0007] and [0020] that the gist of the invention actually resides in the combination of the thermal inhibition step together with the pregelatinisation step which are defined in [claim 1] (steps B and C as above defined), the off flavours removal step (step A) being known in the art and merely juxtaposed to the other two steps to remove off tastes.
Hence, it is to be decided in the first place whether or not the combination of the teaching of **D5** and **D2** is obvious.

The board agrees with the respondent that **D5** does not disclose a pregelatinisation step at all (see section 3.2) and could not, thus, lead to the solution provided by the patent in suit in an obvious manner on its own.

The appellant argued that it would have been obvious to solve the above identified objective problem by combining the teaching of **D5** with that of **D2**.

However, as argued by the respondent, **D5** and **D2** deal with processes for the preparation of granular and non-granular starches, respectively, which are products having completely different structure, properties and functions. In this regard, the board is in particular of the opinion that starting from **D5**, which aims at reinforcing the granular structure of starch by way of thermal inhibition i.e. crosslinking, the skilled person would have had no reason further to modify those toughened starches in order precisely to disrupt i.e. weaken said granular structure. Hence, the board considers that the skilled person would have had no good reason, not knowing the present invention, merely to combine and/or juxtapose the processes of **D5** and **D2** (could/would approach).
The argument of the respondent that the skilled person would have done so because it represented an obvious alternative is, in the board's view, based on hindsight, knowing the result of the patent and relying on the achieved commercial success of the products so obtained (see **D26**).

Besides, taking into consideration that the process of **D5** starts from a native, untreated starch, the only combination of **D5** and **D2** which might be contemplated

would be to thermally inhibit a starch according to **D5** first, followed by the combined off flavours and pregelatinisation treatment taught in **D2**. However, these two processes are antagonistic to each other: whereas the process of **D5** leads to the inhibition i.e. crosslinking and reinforcing of the starch granules, the processes of **D2** rely on the opening of said granules, as unambiguously taught at col. 2, lines 35-39. It is further conspicuous to the board that **D2** contains no indication or hint which would lead the skilled person to believe that the process disclosed therein would also work with inhibited starches as prepared in **D5**, i.e. starches wherein the granules have been crosslinked and, thus, toughened.

On the basis of these considerations, the board comes to the conclusion that the skilled person aiming at solving the above objective problem would not have combined two processes which are antagonists (granular as opposed to non-granular starches) and which are based on diametrically opposed concepts (breaking up of the granules as opposed to crosslinking them). The combination of the teaching of **D5** and **D2** is, thus, not obvious.

4.6 The board is aware that the appellant had raised in writing an objection of lack of inventive step based on the combination of **D5** and **D23** and/or **D25**. During the oral proceedings, the appellant has, however, withdrawn its request to admit **D23** and **D25** into the proceedings (see section XX), thereby implicitly withdrawing its former objections based on these documents, which are, therefore not considered in the present decision.

4.7 The board is, thus, satisfied that the subject matter of the main request is inventive.

5. The main request of the respondent (patent proprietor) being allowable there is no need for the board to consider its auxiliary requests 1-4.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

E. Görgmaier R. Young