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D E C I S I O N
of 9 February 2004

Case Number: T 0782/99 - 3.3.6

Application Number: 93120218.8

Publication Number: 0603727

IPC: D21H 17/28

Language of the proceedings: EN

Title of invention:
Method of papermaking using crosslinked cationic/amphoteric starches

Patentee:
National Starch and Chemical Investment Holding Corporation

Opponent:
ROQUETTE FRERES, S.A.
Cerestar Holding B.V.

Headword:
Method of paper making/NATIONAL STARCH

Relevant legal provisions:
EPC Art. 100(b)

Keyword:
"Sufficiency of disclosure (yes): No credible evidence that disclosed measuring method lacks reproducibility"

Decisions cited:
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Catchword:
-

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Case Number: T 0782/99 **-** 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 9 February 2004

Appellant: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 7 July 1999 revoking European patent No. 0603727 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: P. Krasa
Members: P. Ammendola
V. Di Cerbo

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division revoking European patent No. 0 603 727 concerning a method of papermaking. Granted claims 1 and 6 are independent and read:

"1. A method of making paper wherein a crosslinked, cationized or amphoteric starch is added to the wet end system, using as the starch a cationized or amphoteric starch which has been crosslinked by adding enough crosslinking agent to provide a starch having a % breakdown viscosity of from about 2 to 85% and wherein the crosslinked, cationized or amphoteric starch has been jet cooked at a temperature of from about 90 to 163°C (195 to 325°F) under super atmospheric pressure."

"6. A crosslinked, cationized or amphoteric starch composition for use in papermaking comprising a cationized or amphoteric starch which is crosslinked by adding enough crosslinking agent to provide a starch having a breakdown viscosity of from about 2 to 85% wherein the crosslinked, cationized or amphoteric starch is jet cooked at a temperature of from about 90 to 163°C (195 to 325°F) under super atmospheric pressure."

The remaining granted claims 2 to 5 and 7 to 9 are dependent on claim 1 and 6, respectively.

II. The Respondents I and II (Opponents I and II) filed notices of opposition based on lack of novelty and of inventive step (Article 100(a) in combination with Articles 52(1), 54 and 56 EPC). Respondent I raised

also insufficiency of disclosure as ground of opposition (Article 100(b) EPC).

Respondent I filed under cover of a letter dated 2 March 1999 an experimental report on a series of comparative tests carried out by a third person (Laboratoires Cerbia-Iris) on starch samples provided by Respondent I. This experimental report comprised details as to the method actually used by the third person for measuring the percent of breakdown viscosity (hereafter "%BV") as well as a copy of the following document:

Document (11)= W.C.Shuey *et al.,* "The Amylograph Handbook", A.A.C.C., USA, 1988, pages 1 to 36.

Also Respondent II measured the %BV on starch samples provided by Respondent I and filed the obtained results under cover of a letter dated 19 April 1999.

III. The Opposition Division held that Respondent I had sufficiently substantiated (Rule 55(c) EPC) within the none-month opposition period the ground of opposition under Article 100(b) EPC.

It considered *inter alia* that in the opposed patent the method for measuring %BV was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
In particular, the skilled person could not derive from the patent in suit a clear instruction, as to which heating rate and which pH value had to be used when measuring the %BV.

The Opposition Division also decided to disregard the experimental data filed by Respondent II under cover of the letter of 19 April 1999 since these were filed late and not more relevant than those carried out by the third person and already filed by Respondent I.

IV. The Appellant appealed against this decision and filed with the grounds of appeal two new sets of amended claims as first and second auxiliary requests. Three further sets of amended claims were filed by fax on 29 January 2004(third auxiliary request) and on 4 February 2004 (fourth and fifth auxiliary requests). At the oral proceedings held on 9 February 2004 before the Board the Appellant no longer maintained the objection previously raised in writing as to the fact that the ground of opposition under Article 100(b) EPC had not been sufficiently substantiated by Respondent I within the nine-month opposition period.

V. The Appellant submitted orally and in writing the following arguments:

– The patent in suit disclosed at page 7, lines 10 to 21, the method actually used by the inventors for measuring the %BV (hereinafter "the method of Example III"), which method was clearly reproducible by a person skilled in the art of starches. In particular, the fact that anhydrous starch samples were to be used for the measurement would have been self-evident. Moreover, in the method of Example III the expression "*rapid heating*" would unambiguously identify the uncontrolled heating rate obtained when

positioning the heat switch of the precisely identified apparatus (i.e. the Brabender viscoamylograph) in the only possible position other than that of controlled heating rate of 1.5°C/min.

– It was self-evident that the method for measuring the %BV disclosed at page 10, lines 15 to 20 (hereinafter "the method of Example VI") was substantially identical to that of Example III, even though an error in drafting the parent application had rendered its description contradictory. This error could however be amended under the provisions of Rule 88 EPC. Thus, it would be evident that the method of Example VI comprised the use of the same citric acid solution as disclosed in Example III.

VI. The arguments submitted orally and in writing by the Respondents may be summarized as follows:

– Two different methods for measuring the %BV were disclosed in the patent in suit. They resulted necessarily in different %BV values, therefore the skilled person would not know which of the two methods was to be used for carrying out the invention.

– Moreover, none of the two methods was disclosed in a manner sufficiently clear and complete to be carried out by a skilled person. In particular, the latter would not consider reasonable to use in the method of Example III the uncontrolled "full power" setting of the Brabender viscograph for the

heating, since it would expect that such non-conventional heating conditions would be detrimental to the reproducibility of the measurement. Therefore, it would disregard the instruction to use "rapid heating" as unclear or erroneous and use instead the conventional controlled heating rate of 1.5°C/min. Moreover, the skilled person would not learn from the patent in suit whether anhydrous starch samples or only roughly dried ones, i.e. still comprising substantial amounts of water, were used in the test of Example III.

– Additionally, the skilled person would immediately recognise that the method of Example III could not possibly result in %BV values falling in the range defined in the patent claims, when applied to starches identical or similar to those of the patent examples, since in this method the treatment at 95°C for 30 minutes at the disclosed strongly acidic pH would inevitably produce complete hydrolysis of these starches to a non-viscous liquid.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted or on the basis of the first or second auxiliary request filed with the grounds of appeal, or of the third auxiliary request filed by fax of 29 January 2004 or of the fourth or fifth auxiliary requests filed by fax of 4 February 2004. Furthermore, it requested correction of the description, page 10, lines 15 to 18.

VIII. The Respondents requested that the appeal be dismissed.

Respondent II further requested that the experimental data filed under cover of the letter dated 19 April 1999 be admitted into the proceedings.

Reasons for the Decision

1. *Sufficiency of disclosure of the patent as granted (Articles 83 and 100(b) EPC)*

1.1 The starch referred to in the independent granted claims 1 and 6 is, before being jet-cooked, crosslinked by using an amount of crosslinker sufficient to produce a **%BV of from about 2 to 85%**.

The Respondents have contested the sufficiency of disclosure of the patent in suit only with regard to the method for measuring such %BV.

1.2 Relevant disclosure in this respect is to be found in the above-identified portions of the patent specification (see above point V of the Facts and Submissions) that describe the method of Example III and that of Example VI.

The method of Example VI comprises however an **obscure** definition of the solution into which the starch is to be dissolved as a "*…sodium citrate solution (52.55 citric acid monohydrate dihydrate dissolved in……*". In this definition the expression "*citric acid monohydrate dihydrate*" is undisputedly erroneous and contradictory

in respect of the immediately preceding "*sodium citrate*".

1.3 The Appellant has argued that the method of Example VI was substantially identical to that of Example III and that this would be apparent from the description of Example VI, which starts with "*Viscosity analysis……was run using a C. W. Brabender Viscoamylograph as in Example III*.". Since in Example III "*citric acid monohydrate*" is the compound used for forming the solution to which the starch is added, it concluded that it would also be immediately evident that a citric acid solution had necessarily been used also in Example VI. Hence, the Appellant concluded that it would have been possible under the provisions of Rule 88 EPC to amend accordingly the above identified (only apparently) obscure expression in Example VI.

1.4 The Board finds however that the reference to the method of Example III given at the beginning of the description of the method of Example VI does not exclude the existence of differences between the two %BV measuring methods. On the contrary, it is immediately evident from the subsequent portion of Example VI that in this latter method at least the used amount of solution (20 g) is different from that (i.e. 30 ml) used in the method of Example III. This fact has not been disputed by the Appellant.

Therefore, the Board finds that it is **not** possible to unambiguously derive from the patent in suit that the compound used in the method of Example VI for preparing the solution must **necessarily** have been the same as in Example III (i.e. "*citric acid monohydrate*") rather

than, e.g., its sodium salt (i.e. the "*sodium citrate*" also mentioned in the obscure definition cited above at point 1.2).

Accordingly, it is not possible to establish with certainty which definition of the chemical composition of the solution should replace the present defective definition given in the method of Example VI at page 10, lines 15 to 18. Thus, also its clarification as requested by the Appellant is not allowable under the provisions of Rule 88 EPC and must be refused.

1.5 The Respondents have maintained that, even if affected by uncertainty as to whether the used compound for the solution in Example VI was citric acid or its sodium salt, it would still be apparent that this example disclosed a second method for measuring the %BV and that it would necessarily provide viscosity measurements different from those of Example III. They concluded, therefore, that the existence of these different methods for measuring the %BV would oblige the skilled person to guess which of them should be used by the person skilled in the art when attempting to carry out the invention.

1.6 This argument implies *inter alia* the assumption that the person skilled in the art, who wants to carry out the invention defined in the patent in suit, would regard both the method of Example III and that of Example VI as **suitable** for measuring the %BV.

In the present case however, as discussed above at item 1.4, an erroneous and contradictory instruction as to the kind of solution is present in the method of Example VI.

Hence, only the method of Example III is at least *prima facie* suitable for carrying out the invention.

This conclusion is corroborated by the letter of 18 December 1997 of Respondent I (see grounds of opposition, page 6, lines 6 to 7) explicitly acknowledging that the **only** precise method for measuring the %BV disclosed in the patent in suit is that of Example III.

1.7 Therefore, the Board concludes that the person skilled in the art would attempt to carry out the invention considering **only** that method for measuring the %BV the disclosure of which is free from evidently erroneous and contradictory instructions, i.e. that of Example III, and would disregard the evidently defective information in Example VI.

1.8 The Respondents contented that the disclosure of the method of Example III was insufficient and incorrect, taking into account:

(a) the absence of any explicit indication as to the water content of the dried starches samples tested with this method.

(b) that the disclosed "rapid heating" cannot be used for determining the %BV.

1.9 In the Board's view these Respondents' allegation are not convincing for the following reasons.

1.9.1 In respect of the absence of explicit indication of the water content in the starch samples tested with the method of Example III, the Board observes that, as credibly maintained by the Appellant, in the absence of any explicit instruction the person skilled in the art would necessarily assume that the given weight amount, the same for all the different starch samples analyzed in Example III, can only refer to the weight of anhydrous starch.

Moreover, the above finding is also implicitly confirmed by the fact that Respondent I has not raised in the grounds of appeal any doubts as to how to prepare the starch samples that it alleged to have tested according to this method (see page 6, lines 8 to 13, of the grounds of opposition of Respondent I), nor has found necessary to specify in any of its submissions the water content of the starch samples that it has sent to the third person or to Respondent II.

Therefore, the Board considers credible that the person skilled in the art would assume that the weight amount given in the method of Example III for the starch sample refers to that of the **anhydrous** starches.

1.9.2 With regard to the expression "rapidly heating", the Respondents conceded that (as suggested by Document (11), left column, line 9) this would *per se* clearly instruct the person skilled in the art of viscosity measurements to set the heat speed control knob or

switch of the Brabender viscoamylographs on the "full power" uncontrolled heating position.

The Respondents have correctly observed that such setting of the heating rate is normally not used up to the maximum temperature when determining the %BV according to the standard procedures conventional in the field of starches (wherein the uncontrolled "*rapid heating*" is used only during the initial temperature rise up to e.g. 65°C, see Document (11), left column, line 9).

However, the Board finds that, even if it is not conventional to "rapidly heating" starches up to 95°C, this remains a clear instruction that the person skilled in the art is able to repeat. Since there is no obligation for an inventor to describe how to carry out its invention by using only conventional tests, it is irrelevant whether or not the method of Example III is conventional, as long as it is a clear instruction for the person skilled in the art who intends to carry out the invention.

1.10 The Respondents have argued that even if *per se* the instruction to apply rapid heating could be regarded as clear, this instruction would nevertheless be considered erroneous by the person skilled in the art who would use instead the controlled heating rate of 1.5°C/min.

They maintained that the person skilled in the art would expect that the uncontrolled "*rapid heating*" rate would render the measurement not reproducible, in particular, when using different apparatuses.

Significantly different %BV values were also to be expected when repeating the measurement on same sample with the same apparatus, especially at increasing time span between the two measures, in view of the unavoidable wear and tear of the machine.

1.11 The Board observes that in the real world reproducibility of a measurement does not mean production of perfectly identical results. The reproducibility (or reliability) of a measuring method is given if the results of this method on repetition fall within an error margin which is appropriate and acceptable for a given situation and the particular purpose aimed at.

Therefore, the Board accepts that a certain level of reproducibility upon **repetition** is also required for the %BV measurements according to the method of Example III. However, the submission that "rapid heating" actually resulted in a lack of reproducibility upon repetition (or, in other words, in unacceptable errors in the determination of %BV values) requires experimental evidence support it.

Actually, none of the experimental evidence provided by Respondent I tested the reproducibility of the %BV obtainable under "rapid heating". On the contrary, all the available data were obtained by using a controlled heating rate of 1,5 °C/min. Therefore, in the absence of supporting experimental evidence, the Respondents' "lack of reproducibility" submission is to be dismissed as a mere allegation.

1.12 In this respect, the Board observes that also the experimental data filed by Respondent II under cover of the letter dated 19 April 1999, use only a controlled heating rate of 1,5 °C/min. Thus, the Board sees no reason to deviate from the findings of the oppositions division, which considered that these undisputedly late filed data were not more relevant than those provided by Respondent I under cover of the letter dated 2 March 1999 and decided to disregard them. Hence, the request of Respondent II to admit the data filed under cover of the letter dated 19 April 1999 into the proceedings is refused.

1.13 Finally, Respondent I maintained that the method of Example III would be necessarily erroneous because, independently as to how the starch solution was heated up from room temperature to 95°C, any cationized and slightly crosslinked starch similar to those of the patent examples would be fully hydrolyzed during the final 30 minutes step at 95°C under the used very acidic conditions. Thus, no such starches might ever have a %BV value of 85% or less, as required in granted claims 1 and 6, if the %BV was measured under the conditions given in Example III.

1.14 However, also in this respect the Board finds that in the absence of supporting experimental evidence the Respondents' objection amounts to a mere allegation. The results of the available data obtained at constant heating rate of 1.5°C do not allow excluding the possibility that the high %BV values measured in these experiments were due to the prolonged heating phase at controlled heating rate rather than to the 30 minutes

treatments at 95°C. Therefore, also this argument of the Respondents is found not convincing.

1.15 The Board finds, therefore, that the disclosure of the patented invention is sufficiently clear and complete for the invention to be carried out by a person skilled in the art. In particular, the Board concludes, contrary to the finding of the decision under appeal, that Respondents have provided no convincing argument or evidence showing that the patent in suit does not disclose correctly or in sufficient details how to measure the %BV.

2. It follows from the above that the subject-matter of the claims of the granted patent, i.e. the Appellant's main request, is not open to the objection under Article 100(b) on which the Respondents relied. Therefore, there is no need to deal with the claims of the auxiliary requests.

3. In the present case, the Opposition Division has not yet considered the issues of novelty and inventive step, which are essential questions regarding patentability of the claimed subject-matter. Therefore, the Board considers it as justified to remit the case to the first instance for further prosecution (Article 111(1) EPC) on the basis of the claims of patent as granted.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution.

3. The request for correction of the description, page 10, lines 15 to 18 is not allowed.

4. The experimental data filed under cover of the letter dated 19 April 1999 are not admitted into the proceedings.

The Registrar: The Chairman:

G. Rauh P. Krasa