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Datasheet for the decision of 21 November 2007

Case Number: T 0993/06 - 3.3.06

Application Number: 96935649.2

Publication Number: 0857231

IPC: D21C 9/147

Language of the proceedings: EN

Title of invention:
Oxygen delignification of lignocellulosic pulp in two steps

Patentee:
Metso Paper Sundsvall AB

Opponent:
Metso Fiber Karlstad AB
Andritz Oy

Headword: Oxygen delignification/METSO

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 123, 122, 112, 108, 106, 56
EPC R. 89

Keyword:
"Admissibility of appeal (yes)"
"Referral (no)"
"Re-establishment of rights (irrelevant)"
"Main request: inventive step (no)"
"Auxiliary request: extension beyond the application as filed (yes)"

Decisions cited:
G 0001/86, G 0001/97, J 0003/95, T 0212/88, T 0116/90, T 1176/00, T 1081/02, T 0466/03, T 0830/03, J 0027/92

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0993/06 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 21 November 2007

Appellants:
(Opponent I) Metso Fiber Karlstad AB
Box 1033
S-651 15 Karlstad (SE)

(Opponent II) Andritz Oy
Tammasaarenkatu 1
FI-00180 Helsinki (FI)

Representative: Henningsson, Gunnar
AWAPATENT AB
Box 45086
S-104 30 Stockholm (SE)

Respondent: Metso Paper Sundsvall AB
(Patent Proprietor) S-851 94 Sundsvall (SE)

Representative: Pfenning, Meinig & Partner GbR
Patent- und Rechtsanwälte
Theresienhöhe 13
D-80339 München (DE)

Decision under appeal: **Interlocutory decisions of the Opposition Division of the European Patent Office posted 13 April 2006 and 22 May 2006 concerning maintenance of European patent No. 0857231 in amended form.**

Composition of the Board:

Chairman: P.-P. Bracke
Members: G. Dischinger-Höppler
U. Tronser

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance of the European patent No. 0 857 231 in amended form on the basis of the then pending main request, the independent Claim 1 reading:

"1. A method of extended oxygen delignification of pulp from lignocellulosic material at medium concentration in two steps where the temperature in the first step is held below 90°C and in the second step above 90°C and where oxygen and alkali additions to the first step are high, characterized in that the temperature increase between the two oxygen steps is 10-15°C, that the pressure in the first step is 4-10 bar and in the second step 2-5 bar, the pressure in the first step being higher than in the second step, that the oxygen addition to the first step is high, 25-50 kg/ton pulp, and that alkali is added only to the first step for obtaining a high alkalinity in the first step, 25-50 kg alkali per ton pulp."

II. Two notices of opposition had been filed against the granted patent, wherein the Opponents sought revocation of the patent on the grounds of Article 100(a) EPC for lack of inventive step (Articles 52(1) and 56 EPC). The oppositions were based, amongst others, on the following documents

D1 US-A-5 217 575,

D2 US-A-4 946 556,

D5 Yuji Miyata, "Operating Experiences with 2-stage oxygen Delignification at Chuetsu, Sendai Mill", in Kamyr-Götaverken Symposium in Tokyo, April 1993, pages 1 to 11

D6 WO-A-95/08664,

D8 Shinichiro Kondo, "Two Stage MC-Oxygen Delignification Process and Operating Experiences", in Proceedings 1992 Pan-Pacific Pulp & Paper Technology Conference, September 1992, pages 23 to 31, and

E2 a telefax regarding a laboratory study, Rosendahl 2000.

During oral proceedings before the Opposition Division Opponent I relied on experiments provided in a declaration by Ms. Bokström filed by the Patent Proprietor during the Examining proceedings.

III. At the end of the oral proceedings held on 7 November 2005, the Opposition Division announced that "claim 1 according to the main request meets the requirements of the EPC" and informed the parties that the Proprietor was given a period of two months to adapt the description to the amended claims.

Following the filing of an amended description, the Opposition Division issued a decision dated 13 April 2006 and another decision dated 22 May 2006. The tenor and the reasons of both decisions were identical in that the Opposition Division held that the subject-matter claimed in accordance with the main request

fulfilled the requirements of the EPC. In particular, it was held that the claimed subject-matter was not obvious over the cited prior art.

However, there was one single difference between the decisions in that under the headline 'Documents for the maintenance of the patent as amended' the earlier decision referred to a "Description, Pages 2, 3 of the patent specification", whereas the latter decision referred to a "Description, Pages 2, received on 29.03.2006 with letter dated 29.03.2006". Both decisions included instructions on the possibility of appeal.

IV. Opponent II filed a notice of appeal on 23 June 2006, paid the appeal fee simultaneously and filed a written statement setting out the grounds of appeal on 27 September 2006.

Opponent I filed a notice of appeal on 14 July 2006, also paid the appeal fee simultaneously and filed a written statement setting out the grounds of appeal on 29 September 2006.

Both appeals were directed explicitly against the interlocutory decision of the Opposition Division dated 22 May 2006.

V. In a communication dated 6 December 2006, the Board raised questions in relation to the admissibility of both appeals. In a letter dated 6 February 2007, the Opponent II filed arguments why its appeal should be held admissible. In the alternative, the Opponent II requested re-establishment of rights under Article 122

EPC and paid the corresponding fee simultaneously. In a second communication dated 7 May 2007, the Board indicated the possibility of the application of the principle of good faith.

VI. Under cover of a letter dated 14 May 2007, the Opponent I withdrew its appeal.

During the appeal proceedings, the Patent Proprietor, now Respondent, filed observations with regard to the Board's second communication and two diagrams D15 and D16 illustrating the results in the Bokström declaration. Further, the Respondent maintained the claims held allowable by the Opposition Division as its main request.

VII. Upon requests made by Opponent II, now Appellant, and the Respondent, oral proceedings before the Board were held on 21 November 2007. In the course of these proceedings, the Appellant filed inter alia a notice of its representative concerning a telephone conversation with the Formalities Officer of the Opposition Division dated 30 May 2006.

The Respondent filed an amended set of claims in an auxiliary request, Claim 1 of which differs from Claim 1 of the main request by introducing the feature "by admixing steam" between the terms "in that the temperature increase" and "between the two oxygen steps".

Concerning the admissibility of the Appellant's appeal, the Respondent filed the following questions to be referred to the Enlarged Board of Appeal:

1. Can the principle of the protection of legitimate expectation overrule the principle of res judicata?

2. If the question is positively answered: Under which conditions the principle of the protection of legitimate expectation can overrule?

VIII. The Appellant orally and in writing submitted that the appeal should be considered admissible for the following reasons:

The second decision of the Opposition Division was not a new decision but a new corrected notification of the decision taken at the oral proceedings which was accompanied by the communication: 'Please find enclosed an Interlocutory Decision with a new date' and an information about the possibility of appeal. The words 'new date' could not mean anything other than a date replacing the previous date. Hence, the Appellant could not but assume that it was the new corrected notification of the interlocutory decision that was decisive for the date of the notification. In order to be completely sure, the Appellant's representative called the Formalities Officer of the Opposition Division on 30 May 2006 who confirmed that the new notification of the interlocutory decision was to be considered as triggering the notification date for filing an appeal against the decision taken in the case.

Concerning the merits of the case, the Appellant submitted in essence that the claimed subject-matter was not inventive over the prior art disclosed in document D1 as the closest prior art. This was due to

the fact that the subject-matter of Claim 1 differed from that prior art essentially only in that it was required that in the second step the pressure was lower and the temperature 10 to 15°C higher than in the first step. However, the requirement of a lower pressure in the second step was inherent in the disclosure of document D1 since there was no pressure enhancing equipment like a second pump provided between the two steps so that it was inevitable that a pressure drop occurred between the first and second step. Claim 1 did, further, not call for a specific pressure difference and covered any values, hence, also infinitely small values of no significance. Moreover, applying a lower pressure in the second step was explicitly disclosed in the prior art, e.g. in document D5.

Document D1 did not disclose the temperature difference required in accordance with Claim 1, but a temperature increase between the two steps in the range of 10 to 15 °C was known in the art, e.g. from documents D2 and D6. In addition, it was known from document D8 that reduction of both, the Kappa number and the viscosity of the pulp increases as the reaction temperature increases and, further, that the selectivity decreases above 90°C. Hence, for a skilled person the question of choosing the temperature in the first and second delignification steps was only a question of producing either a better Kappa number or a better strength of the pulp. Considering that no other effects had been shown or are apparent to be due to the claimed subject-matter in view of the process disclosed in document D1, it was obvious for the skilled person to choose the temperature in accordance with circumstances.

Further, the Appellant objected to the amendment made in Claim 1 of the auxiliary request under Articles 123(2) and (3) EPC.

IX. The Respondent in particular argued that the parties to the proceedings before the EPO were normally represented by professional representatives, that in a similar case (T 116/90) two appeals were filed as a precaution and that the first decision was res judicata and could not be amended by the Opposition Division (J 3/95, OJ EPO 1997, 493 and G 12/91, OJ EPO 1994, 285). Further, the Respondent objected for the first time during oral proceedings that no evidence was provided in support of the alleged telephone conversation. In the Respondent's view, the latter was indispensable for the application of the principle of protection of good faith. Hence, it was necessary for deciding on the admissibility of the appeal to refer the above questions (point VII above) to the Enlarged Board of Appeal in order to clarify if, and if yes, under what circumstances, the principle of protection of legitimate expectation can overrule the principle of res judicata. Further, the Appellant had not applied all the due care necessary for the requested re-establishment of rights according to Article 122 EPC.

Concerning inventive step, the Respondent argued in essence that the advantages of the specific combination of reaction conditions selected in accordance with Claim 1 for the first and second process steps were indicated in the patent in suit. Thus, the technical problem solved by the claimed process in view of that disclosed in document D1 consisted in the provision of extended oxygen delignification without deteriorating

the properties of the pulp. As the specific combination of features was not suggested in the prior art, the claimed subject-matter was not obvious.

In addition, it was argued that document D1 as the closest prior art did not disclose a pressure difference between the steps and taught that the temperature in the second step should be at least 20°C, preferably 30°C, higher than in the first step. It was shown in Figure 2 of document D1 that a change of the temperature difference from 30°C to 20°C implied a negative impact on the ratio of viscosity to Kappa number. Thus, document D1 taught that a temperature decrease in the first step was harmful. In contrast, document E2, a laboratory study on behalf of the Respondent, and the experiments provided in the Bokström declaration showed a better selectivity if the temperature increase was 10°C instead of 20°C or 15°C instead of 25°C, respectively. Further, it was apparent from document D16 that under the claimed process conditions even an increase in alkalinity did not enhance deterioration of the pulp. Finally, the Respondent found that the documents cited by the Appellant in relation to the temperature difference were not relevant since they did not concern the particular combination of features in Claim 1 but other specific processes.

With respect to the auxiliary request, the Respondent argued that those skilled in the art would understand by the amended wording that the temperature increase of 10 to 15°C was not only brought about by the heat production inherent in the process.

X. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the appeal be rejected as inadmissible (main request), the aforementioned questions (point VII above) be referred to the Enlarged Board of Appeal (first auxiliary request), the request of the Appellant under Article 122 EPC be dismissed (second auxiliary request), the appeal be dismissed (third auxiliary request) or the decision under appeal be set aside and the patent be maintained on the basis of Claims 1 to 3 of the auxiliary request submitted under cover of a letter dated 19 October 2007 (fourth auxiliary request).

Reasons for the Decision

1. *Admissibility of the Appellant's appeal*

1.1 The Appellant filed a notice of appeal within the time limit triggered by the notification of the first decision of the Opposition Division dated 13 April 2006 and paid the appeal fee simultaneously.

The statement setting out the grounds of appeal, however, was filed on 27 September 2006 and thus within four months after the date of notification of the second decision of the Opposition Division dated 22 May 2006 but not observing the time limit under Article 108 sentence 3 EPC with regard to the first decision dated 13 April 2006. In the notice of appeal it is indicated that it is "against the Interlocutory Decision taken by the Opposition Division (dated

22.05.2006)" and requested "that said Interlocutory Decision be set aside and that the patent be revoked."

From this clearly worded request it follows that the Patent Proprietor was no longer left uncertain as to whether an appeal had been lodged and that Opponent II would continue to challenge the patent even as maintained in amended form, once the two-month time limit for appeal under Article 108 EPC with regard to the first decision of the Opposition Division had expired. The date 22.05.2006 given in the notice of appeal indicating the decision under appeal could not mislead the Patent Proprietor about the aim of the Opponent's appeal unambiguously laid down in the corresponding request. Hence the 'raison d'être' the provision of Article 108 sentence 1 EPC was created for (see G 1/86 OJ EPO 1987, 447, points 5, 8 and 9) is kept in the present case by observing the two-months time limit with regard to the first decision of the Opposition Division dated 13 April 2006.

1.2 Since the Opposition Division and thus the European Patent Office itself has caused confusion by issuing a first decision dated 13 April 2006 and a second decision dated 22 May 2006 it would conflict with the principle of legitimate expectation generally followed by the European Patent Office (see Case Law of the Boards of Appeal, 5th edition, Chapter VI. A. 1.) to regard the appeal (being admissibly set in motion by observing the two-month time limit respective to the first decision of the Opposition Division and thus safeguarding the legitimate interests of the Patent Proprietor) as inadmissible on the grounds that the statement of the grounds of appeal was not filed within

the four-month time limit with regard to the first decision of the Opposition Division but observing the same time limit in respect of the second decision of the Opposition Division.

This confusion was provoked by the Opposition Division on three counts:

- When detecting the erroneous indication of the documents for the patent as amended "description pages 2,3" on the first decision - which was clearly an obvious mistake - the Opposition Division did not issue a decision correcting this pursuant to Rule 89 EPC and giving the true reasons for the correction of the indication into "description pages 2" but reissued a second decision simply recapitulating the order, the summary of facts and submissions and the reasons for the decision of its first decision.

- Furthermore the Opposition Division attached to this second decision a communication informing of the possibility of appeal according to Article 106 (1) EPC on EPO-Form 2327, even though a corrective decision under Rule 89 EPC has retroactive effect and thus alters neither the date of the first decision nor the time limit for appeal (see T 212/88 point 1, OJ EPO 1992, 28; T 1176/00 point 1.2).

- The second decision of the Opposition Division was accompanied by a communication of the Formalities Officer containing the information "please find

enclosed an Interlocutory Decision with a new date".

It must be pointed out that the Board, at the first sight into the opposition file, also remained in the dark as to the purpose of this reissuing action of the Opposition Division.

The confusion thus provoked by the second decision of the Opposition Division and the attachments thereto was completed by the telephone conversation on 30 May 2006 between the representative of Opponent II and the Formalities Officer informing him, that the second decision was to be considered as triggering the time limits under Article 108 EPC. As proof that this telephone conversation took place the Appellant has produced a piece of evidence during oral proceedings after this fact had been doubted by the Patent Proprietor during these oral proceedings for the first time (as to the application of the principle of legitimate expectation even to a party to the proceedings represented by a professional representative, see T 1081/02, point 1.3.5).

The principle of legitimate expectations not only applies to written communications but also to oral communications by the European Patent Office (see J 27/92 headnote 1 and points 3.1 and 3.3 OJ EPO 1995, 288). After all it is to be seen that the four-month time limit under Article 108 sentence 3 EPC is created to tighten the appeal procedure (see G 1/86 as cited above). The Board has no reason to doubt that Opponent II would have complied with the requirements of Article 108 sentence 3 EPC if he had not been misled

by the inappropriate actions of the Opposition Division. Having regard to the scale of the unacceptable acts of the Opposition Division, the Board regards it as disproportionate to impose on the Appellant the filing of two statements of grounds of appeal as a precaution (following T 116/90) (as to the application of the principle of legitimate expectations in the case of re-issuing of a decision of the Opposition Division see T 466/03d; T 830/03; Case Law, 5th edition Chapter VI.A.1.2).

2. *Referral of questions to the Enlarged Board of Appeal*

Since the second decision dated 22 May 2006 aimed at the correction of the obviously wrong indication of the description pages for the maintenance of the patent as amended in the first decision dated 13 April 2006 and thus was a correcting decision by its nature, the Opposition Division undoubtedly had the power under Rule 89 EPC to reach such a decision and thus there was no conflict with the principle of res judicata. The Opposition Division, however, did not give the true reasons for issuing the second decision and thus misled the Opponents. Therefore, it would conflict with the principle of legitimate expectations to object that Opponent II erroneously filed its statement of grounds of appeal within the four-month time limit in respect of the second decision but not within this time limit in respect of the first decision of the Opposition Division.

Thus, the questions raised by the Respondent cannot be considered to be an important point of law relevant for

the decision in this appeal case (see Article 112(1) EPC).

3. *Appellant's request under Article 122 EPC*

Since the Board has already decided in favour of the admissibility of the appeal in applying the principle of legitimate expectation, a decision upon the Appellant's request under Article 122 EPC is unnecessary.

4. *Main Request*

The only point at issue in regard of the main request is whether or not the subject-matter claimed therein is based on an inventive step.

4.1 The patent in suit is directed to a method of oxygen delignification of lignocellulosic material at medium consistency. In particular, the patent in suit relates to a two step process wherein the temperature in the first step is held below 90°C and in the second step above 90°C and 10 to 15 °C higher than in the first step, wherein the pressure in the first step is 4 to 10 bar and higher than in the second step where it is 2 to 5 bar, and wherein oxygen is added to the first step in an amount of 25 to 50 kg/ton pulp and alkali is added only to the first step and in an amount of 25 to 50 kg/ton pulp (Claim 1 and paragraph [0001]).

It is explained in the description of the patent in suit that extended delignification as a method of chlorine-free bleaching had become increasingly interesting but can result in deteriorated pulp.

However, it is indicated that right conditions may yield advantages. Particular advantages may be expected from a multi-step method since it should be possible to distribute the chemicals between the steps to obtain optimised conditions in every step (paragraphs [0002], [0004] and [0006]).

Hence, the technical problem the patent in suit seeks to solve by the claimed method consists in the provision of extended oxygen delignification to obtain a lower Kappa number without deteriorating the properties of the pulp (paragraph [0007]).

4.2 There was no dispute between the parties concerning document D1 as a suitable starting point for the assessment of inventive step. The Board agrees with the parties since document D1 is the only prior art mentioned in the patent in suit and relates to a two step process for oxygen delignification of medium consistency pulp wherein the first step is held at a lower temperature of between 70 and 90°C, preferably 75 and 85°C, than the second step where the temperature is within a range of 90 to 125°C, preferably between 95 and 110°C. The temperature difference shall be 20 to 40°C, preferably 30°C (patent in suit, paragraph [0003]; document D1, Claim 1, column 2, line 67 to column 3, line 8 and column 2, lines 35 to 36).

In two tests included in the example, the process of document D1 is applied on 10% consistency pulp at a temperature of 85°C in the first step, 105°C in the second step and at an initial super atmospheric pressure of about 0.5 MPa (5 bar) in both steps while adding 25 or 30 kg, respectively, of alkali per ton of

pulp (column 3, lines 20 to 51 and Figure 2). The tests are carried out in a bleaching plant as shown in Figure 1 according to which the alkali may be either charged to the first step only or further alkali may be added to the second step (column 2, lines 52 to 60). The amount of oxygen to be added is not mentioned in document D1.

Hence, the disclosure of document D1 differs from the subject-matter of Claim 1 in that

1. the difference in temperature between the steps is not less than 20°C;

2. the amount of oxygen to be added is not indicated;

3. there is no mention of a pressure difference between the steps, and

4. further alkali may be added to the second step.

4.3.1 Concerning the advantages of the claimed combination of process conditions, the Respondent relied on the patent in suit where it is stated that the high pressure, high alkalinity and high oxygen charge selected for the first step result in a high delignification speed while the speed for cellulose degradation is low, due to the low temperature and short stay time. Further, it is stated that due to the fact that no alkali is added to the second step, cellulose degradation is avoided in spite of the high temperature and stay time (paragraphs [0012] and [0016]).

The Board observes that the stay time is not a feature of Claim 1 and the advantages are not mentioned in relation with the prior art disclosed in document D1. In particular, it is noted that no evidence is on file showing by comparison that the claimed combination of process conditions provides any unexpected advantages over the process disclosed in document D1. This was confirmed by the Respondent during the oral proceedings before the Board. Hence, there is also no evidence that the technical problem mentioned in the patent in suit (point 4.1 above), namely to obtain a lower Kappa number without deteriorating the properties of the pulp, is solved in view of the disclosure of document D1.

4.3.2 However, the Respondent argued that at least the claimed temperature difference between the steps provided an unexpected improvement over the prior art disclosed in document D1.

In the Respondent's view, a person skilled in the art would be dissuaded by Figure 2 of document D1 from applying a temperature difference of only 10 to 15°C since this Figure showed a negative impact on the ratio of viscosity to Kappa number already if the temperature difference changed from 30°C to 20°C.

In contrast, the results in the laboratory study E2 showed a better selectivity if the temperature difference was 10°C instead of 20°C and the focussed presentations in the diagrams D15 and D16 of the results obtained in the experiments of the Bokström declaration illustrated the same improvement if the temperature difference was 15°C instead of 25°C. In particular, the diagram D15 showed a higher

preservation of the strength of the pulp (higher viscosity) and the diagram D16 showed a higher selectivity, i.e. a lower loss of viscosity per Kappa number unit reduction, if the temperature difference was only 15°C.

4.3.3 This argument is not convincing for the following reasons:

Figure 2 of document D1 represents in three graphs the various tests carried out at variable alkali addition in accordance with the example. The tests differ from each other essentially in that the temperature in the first step is 75°C, 85°C and 105°C whereas the temperature in the second step is 105°C in all cases. The graphs are roughly parallel to each other and in each graph the Kappa number and the viscosity of the pulp decreases with increasing amount of added alkali. It can be seen that the graph illustrating the tests with the largest temperature difference (75°C/105°C) extends as a whole at a higher viscosity level than the graph for the tests with the lower temperature difference (85°C/105°C) and the graph for the tests with no temperature difference (105°C/105°C) extends at the lowest viscosity level. However, this benefit for the 75°C/105°C tests is not necessarily due to the temperature difference as such (30°C instead of 20°C or 0°C) but may as well be a result of the fact that the lowest temperature, hence the mildest condition, was used in the first step.

Concerning the laboratory study E2, the Board observes that the second test in Table 1 can be compared with the fourth test since they differ from each other only

in the temperature used in the second step (100°C versus 110°C) whereas other tests differ in addition with respect to further process conditions (amounts of alkali and magnesium sulphate). It can be seen from that comparison that the viscosity loss per Kappa number reduction, hence the selectivity, is rather the same in both cases in spite of the fact that the fourth test had been carried out at a higher temperature in the second step, i.e. at more severe process conditions.

Also the experiments provided in the Bokström declaration as illustrated in documents D15 and D16 do not support the advantages alleged by the Respondent. The experiments have been carried out at temperatures of 85°C in the first step and 100°C or 110°C in the second step with alkali additions of 18, 22 and 26 kg/ton of pulp. The diagram D15 shows that the viscosity and the Kappa number of the pulp decrease with increasing alkali addition and, further, that the viscosity of the pulp is generally lower at the higher temperature increase between the steps (85°C/110°C), i.e. if in the second step the temperature is 110°C instead of 100°C. Further, it can be seen from both, document D15 and D16 that for a given amount of added alkali, the Kappa number reduction is higher for 110°C. The diagram D16 additionally shows a better selectivity if the temperature in the second step is lower (100°C instead of 110°C).

Hence, the diagrams indeed show a viscosity gain and selectivity improvement in the case of 100°C in the second step. However, in contrast to the Respondent's view this effect cannot be clearly attributed to the lower temperature increase (15°C as compared with 25°C)

between the steps since there are good reasons to assume that the effect results from the fact that the overall conditions are less severe if the temperature in the second step is only 100°C. This is corroborated by the disclosure of document D1 where it is stated in column 3, lines 52 to 57, that "a high temperature in the initial stage of the oxygen delignification has a negative effect on the viscosity and that a low temperature in the initial stage produces and oxygen-delignified pulp with improved viscosity and with a kappa number lying within the normal and desired range". The Board notes that a "kappa number ... within the normal and desired range" does not exclude a lower Kappa number reduction for the lower initial temperature.

4.4 The Board concludes, therefore, that the technical problem actually solved by the claimed subject-matter in view of the disclosure of document D1 can be seen in providing another two step process of oxygen delignification of medium consistency pulp.

4.5 It remains to be decided whether, in view of the available prior art documents, it was obvious for someone skilled in the art to solve this problem by the means claimed, namely by adding oxygen in an amount of 25 to 50 kg/ton of pulp to the first step, adding alkali only to the first step and by using in the second step a lower pressure and a temperature which is 10 to 15°C higher than in the first step (point 4.2 above).

4.6 During the oral proceedings before the Board, both parties discussed only the features related to the

temperature and pressure conditions as the most relevant ones. The features concerning oxygen and alkali addition were discussed in writing only. However, for the sake of completeness, all features will be considered here.

4.6.1 The Respondent contested neither that the addition of the specific amount of oxygen was known in the art nor that the amount of oxygen required in the delignification process depends on the Kappa number of the ingoing pulp and on the Kappa number reduction to be achieved. The Board concludes, therefore, that the amount of oxygen is a feature which a skilled person would select in accordance with circumstances.

4.6.2 Concerning the requirement that alkali is added only to the first step, the Respondent relied in writing on the argument that according to document D1 further addition of alkali to the second step was possible and the significance of adding alkali to the first step only was not recognised (letter dated 2 March 2007, page 2, first full paragraph). This may be true. However, the Respondent has also not supported by evidence that this feature was indeed significant vis-à-vis the disclosure of document D1. Moreover, the example given in document D1 does not mention any further addition of alkali. The Board agrees, therefore, with the Appellant's opinion expressed in writing that the addition of alkali only to the first step is not only just one out of two possibilities in document D1 but rather recommended by way of the example as the preferred one.

4.6.3 The only information contained in document D1 in relation to the pressure to be applied is given in the

example where it is indicated that the initial pressure in both steps was about 0.5 MPa (5 bar). Hence, it is true that document D1 does not necessarily disclose a pressure difference between the steps. The Board notes, however, that the example has been carried out in a bleaching plant according to Figure 1 of document D1 where no second pressure enhancing equipment (e.g. a second pump) is provided between the steps. The Respondent did not contest the Appellant's argument that under such conditions a pressure drop occurs necessarily. Apart from that, it is known in the art of two step oxygen delignification not only to apply in the steps a pressure within the claimed ranges but also to apply a higher pressure in the first step than in the second step (D5, pages 4 and 5, paragraphs 5-1. and 5-2.). Hence, the Board considers the claimed pressure difference to be usual in the art.

4.6.4 Concerning the claimed temperature increase between the steps, the Appellant argued that in oxygen delignification a lower temperature, as a matter of principle, resulted in a higher viscosity and better selectivity, however at the expense of delignification, i.e. Kappa number reduction. This argument per se was never contested by the Respondent and finds support in documents D1, D8, D15 and D16. Thus, D8 teaches a linear increase of Kappa number reduction as the temperature increases between 80 and 95°C and a linear increase of viscosity reduction up to 90°C, whereafter the decrease is much higher (page 25, right-hand column, paragraph(3)). Document D1 explains the findings from the tests carried out in the example by the negative input on the viscosity of a high temperature in the initial delignification step (column 3, lines 52 to 57).

Finally, the experiments according to the Bokström declaration as illustrated in the diagrams D15 and D16 show the same effect if the temperature as the only variable was increased in the second delignification step, namely a decrease in viscosity (diagram D15) and selectivity (diagram D16), both at improved Kappa number reduction.

The Board concludes, therefore, that a skilled person would choose the temperature in the two steps according to what is preferred, either an improved Kappa number reduction or improved strength preservation.

Finally, the Board also agrees with the Appellant insofar as the claimed range of the temperature increase as such (10 to 15 °C) is anything but unusual in the art of two step oxygen delignification of medium consistency pulp. This is evident from document D2 where the temperature increases by 10°C from the first step to the second step (Table 2) and from document D6, where the temperature increase may be 12 or 14°C (page 6, line 14 to page 7, line 16).

4.7 The Board concludes, therefore, that the particular process conditions in Claim 1 in relation to oxygen addition, alkali addition, pressure reduction and temperature increase are all options which a person skilled in the art would select in accordance with circumstances and in the expectation of providing a different two step process of oxygen delignification from that disclosed in document D1.

For these reasons, the Board finds that the subject-matter of Claim 1 is not based on an inventive step and

does not comply with the requirements of Articles 52(1) and 56 EPC.

5. *Auxiliary request*

Claim 1 of the auxiliary request differs from that of the main request in that the feature "the temperature increase between the two oxygen steps is 10 to 15°C" has been replaced by "the temperature increase by admixing steam between the two oxygen steps is 10 to 15°C".

In support of the amendment, the Respondent referred to page 2, line 4 and page 3, lines 1 to 3 of the application as filed.

There it is disclosed that steam is admixed to the second delignification step for bringing about the required increase in temperature which is necessary for producing a temperature difference between the steps of preferably 10 to 15°C (see also paragraph bridging pages 2 and 3).

Claim 1 in the amended version requires that the whole temperature increase of 10 to 15 °C is due to the admixing of steam. Such an embodiment is not supported by the application as filed since – as agreed by the Respondent during appeal proceedings – oxygen delignification is an exothermic process. Therefore, a certain increase in temperature takes place between the steps of a two step process even if no external heat is applied. Hence, it is apparent to the skilled reader of the application as filed that the amount of steam added

to the second step must be less than that required for a temperature increase of 10 to 15 °C.

The Board concluded, therefore, that the amendment made to Claim 1 of the auxiliary request does not fulfil the requirements of Article 123(2) EPC.

6. Since all of the Respondent's requests fail, the patent has to be revoked.

Order

For these reasons it is decided that:

1. The appeal is admissible.

2. The request for referral of questions to the Enlarged Board of appeal is dismissed.

3. The request of the Appellant for re-establishment of rights to be dismissed is irrelevant.

4. The decision under appeal is set aside.

5. The patent is revoked.

The Registrar: The Chairman:

G. Rauh P.-P Bracke