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**Datasheet for the decision
of 16 March 2007**

Case Number: T 0457/05 - 3.3.06

Application Number: 98903344.4

Publication Number: 0909353

IPC: D21C 3/02

Language of the proceedings: EN

Title of invention:

Method and device for the continuous cooking of pulp

Patentee:

Kvaerner Pulping AB

Opponent:

Andritz Inc.

Headword:

Pulp cooking / KVAERNER

Relevant legal provisions:

EPC Art. 114(2), 56

Keyword:

"Late filed document (admitted) - no abuse of procedure and relevant"

"Inventive step (no)"

Decisions cited:

T 0215/03

Catchword:

-



Case Number: T 0457/05 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 16 March 2007

Appellant: Andritz Inc.
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NY 12801-3686 (US)

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 28 February 2005
rejecting the opposition filed against European
patent No. 0909353 pursuant to Article 102(2)
EPC.

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 decision of the Opposition Division to reject the opposition and to maintain European patent No. 0 909 353 on the basis of 24 claims containing two independent claims.

The independent claim 1 relates to a method of continuously producing pulp comprising, amongst others, the steps of heating and impregnating a slurry of finely divided fibre material by the aid of hot black liquor in an amount exceeding $6\text{m}^3/\text{ADT}$, passing the slurry through an impregnating zone, withdrawing a part of the free liquid therefrom and then transferring the heated and thoroughly impregnated fibre material to a con-current cooking zone in the upper part of a digester.

The independent claim 11 reads:

"11. A two-vessel digesting system for performing the method according to claim 1 comprising:

An impregnation vessel (1) having an inlet portion and an outlet portion (3);

A digester (6) in fluid communication with the impregnation vessel (1) via a digester line that extends between the digester and the impregnation vessel;

A first transfer line (21) between the impregnation vessel and the top of the digester for transporting fiber material to the digester, A separator (23), comprising a withdrawal space, disposed in connection with the first transfer

line (21) either at the top of the digester or at an intermediate position of said transfer line for separating a transport liquid from a fiber material;

A first screen girdle (8) section disposed in the digester for drawing off an amount of a black liquor from the digester and so that a first concurrent cooking zone (B) is defined above the first screen girdle section;

A second transfer line (17) in fluid communication with the impregnation vessel for supplying black liquor withdrawn from the first screen girdle section (8) to the inlet portion of the impregnation vessel (1);

A supply line (24) in fluid communication with a supply space adjacent the top of the digester for supplying a cooking liquor,

A return line (15, 33) attached to the separator (23) and the outlet portion (3) of the impregnation vessel (1) to conduct the transport liquid from the separator back to the first transfer line (21),

characterized in that

a recovery line (24) is attached to the return line to withdraw a substantial amount of spent liquor from the transport fluid and conduct it to a recovery unit, and in that said impregnation vessel (1) is screen less and by said second transfer line (17) being dimensioned for supplying a major amount of the black liquor withdrawn from the first screen girdle section (8) to the inlet portion of the impregnation vessel, such that a

con-current impregnation zone (A) can be established in the whole impregnation vessel."

II. The notice of opposition was based on the ground of lack of novelty, which was withdrawn later during opposition proceedings, and inventive step (Article 100(a), 54 and 56 EPC). The following document was cited amongst others:

D2 WO-A-96/07787.

III. In its decision, the Opposition Division found that the subject-matter of the claims as granted was based on an inventive step in view of the cited prior art.

IV. This decision was appealed by the Opponent, now Appellant, who filed under cover of a letter dated 23 October 2006 document

D24 US-A-5 089 086.

The patent Proprietor, now Respondent, filed submissions in reply.

V. Upon requests made by both parties oral proceedings before the Board took place, namely on 16 March 2007.

VI. The Appellant, orally and in writing, maintained that the claimed subject-matter was not based on an inventive step. He presented, amongst others, the following line of argument:

- D24 was a suitable starting point for the assessment of inventive step since it concerned

the same object as the patent in suit, namely the improvement of pulp quality and heat economy.

- The apparatus disclosed in D24 differed from that of claim 11 only in that the transfer line for recirculating spent liquor from the digester was not connected with the top of the impregnator but with its bottom.
- The technical problem solved by the claimed subject-matter in view of D24 consisted in improving the strength properties of the pulp fibres.
- Solving this problem by transferring spent liquor to the top of the impregnation vessel, was however known from D2.

VII. The Respondent submitted in essence the following arguments in reply:

- D24 was not only late filed but also irrelevant since its main objective consisted in the recovery of heat.
- D24 related to a process and apparatus where no liquor exchange in the sense of the patent in suit took place.
- Further, the apparatus disclosed in D24 did not include the possibility of impregnating the fibre material with black liquor. Instead, it included an extended impregnation at the top of the digester.

- D24 should not, therefore, be admitted in the appeal proceedings.

- Even a combination of the disclosure of D24 with that of D2 would not lead to the claimed subject-matter since in D2 the screen for withdrawing black liquor was not the first screen in the digester and since white liquor was added to the transfer line and, therefore, withdrawn before the cooking zone.

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

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. *Late filed document*

According to Article 114(2) EPC, the Boards of Appeal have a discretionary power to decide whether or not late filed matter is to be admitted into the proceedings. In exercising this discretion, the Board has to consider whether or not the late filing does amount to an abuse of procedure so as to violate the principles of procedural economy and of fairness in relation to the other parties. Further, the criterion of relevance of the new matter has to be taken into account (cf. for instance T 215/03, not published, reasons No. 1).

It is undisputed that D24 has been filed late during appeal proceedings. However, as shown by the Appellant (letter dated 23 October 2006, point 2)) and not contradicted by the Respondent, D24 is the Respondent's own document. Further, D24 is cited in the International Search Report as one of five references and mentioned on the cover sheet of the patent in suit. Moreover, as conceded by the Respondent, it was considered as relevant prior art during the examining proceedings (see International Preliminary Examination Report).

The Board further observes that D24 is a relatively short document consisting of roughly 4 columns of description, 5 claims and one plain figure and has been filed by the Appellant 5 months in advance of the date for oral proceedings (see points IV and V).

In addition, the Appellant has also explained the reasons why D24 has not been filed in due time, namely because initially it had not been identified as a result of the Appellant's online search in the USTPO patent database but was finally found by reviewing the keys of that search.

The Board has no reason to doubt this explanation and concludes that under the particular circumstances of the case the late filing of D24 does not amount to an abuse of procedure since it is a relatively short document which is well-known to the Respondent and was filed well in advance to the oral proceedings so that the Respondent had enough time to prepare its case also under consideration of that document. Therefore,

neither the principles of procedural economy nor of fairness have been violated.

The Board is also of the opinion that D24 is highly relevant with regard to the claimed subject-matter as will be evident from the assessment of inventive step set out below.

Therefore, D24 is admitted into the proceedings.

2. *Inventive step*

2.1 The patent in suit relates to a method and a device for the continuous cooking of pulp. It is preferably directed to the exploitation of the advantages of improved strength properties of the pulp fibres associated with the impregnation of the chips with the aid of hot black liquor (page 2, paragraphs [0001] and [0003] and page 3, paragraph [0009]).

2.2 It is indicated in the patent in suit that the most relevant prior art suggests a counter-current impregnation zone which is, however, difficult to optimise so that the chemical consumption may be undesirably high and/or the quality of the pulp may be lower than desired (page 2, paragraphs [0005] and [0006]). In contrast, the technical effects achieved by the claimed invention are stated to consist in the provision of high quality pulp at reduced consumption of cooking chemicals and better heat economy (reduced H-factor demand) (pages 2 and 3, paragraph [0008] in combination with page 7, paragraph [0047]).

2.3 D2 which was used as the "closest prior art" in the first instance decision (point 3) relates to a method and digester system for increasing the Na_2S concentration in the beginning of the cook with the purpose of improving the selectivity of the cook and the strength of the pulp as well as lowering the kappa number (lignin content) of the pulp (page 1, lines 16 to 19, page 2, lines 4 to 7, page 6, lines 9 to 10 and page 8, lines 3 to 8). D2 does not however consider any improvement of the heat economy or reduction of the chemicals demand.

The Respondent, in writing concluded that D2 "is in fact 'far away' from the invention" (letter of 19 January 2006, point 6.2) but did not propose any other prior art which would be more suitable as a starting point for the assessment of inventive step.

2.4 However, the same technical effects as in the patent in suit, namely an improvement of the quality of the pulp and of the heat economy of the digester at reduced consumption of cooking chemicals are explicitly mentioned in D24 (column 2, lines 3 to 8) as the objective to be achieved.

2.5 D24 specifically discloses for this purpose a two-vessel digesting system comprising

- a screen less impregnation vessel (1) having an inlet portion (top portion) and an outlet portion (bottom portion (27)), wherein a con-current impregnation zone is established in the whole impregnation vessel,

- a digester (2) in fluid communication with the impregnation vessel via lines (12), (13), (14) and (18) that extend between the digester and the impregnation vessel,
- a first transfer line (12) between the impregnation vessel and the top of the digester for transporting fibre material to the digester,
- a separator (26) comprising a withdrawal space disposed in connection with the transfer line (12) at the top of the digester for separating a transport liquid from the fibre material,
- a screen girdle section (19) disposed in the digester which is the first one for drawing off an amount of black liquor (i.e. spent liquor) from the digester and to define a first con-current cooking zone above this screen girdle section,
- a second transfer line (18) in fluid communication (via line (14)) with the impregnation vessel for supplying substantially the total amount of black liquor withdrawn from the screen girdle section (19) to the bottom portion of the impregnation vessel,
- a supply line (10') in fluid communication with a supply space adjacent the top of the digester for supplying cooking liquor,
- a return line (13) (14) attached to the separator and the bottom portion of the impregnation vessel

to conduct transport fluid from the separator back to the transport line (12), and

- a recovery line (17) attached to the return line (13) (14) to withdraw a substantial amount of spent liquor from the transport fluid and conduct it to a recovery unit (Figure in combination with column 3, line 43 to column 4, line 50, column 1, lines 33 to 40 and column 2, lines 12 to 18).

- 2.6 A comparison of this digesting system with that of claim 11 reveals that the only difference resides in the fact that the black liquor transfer line (18) in D24 is not connected with the top portion of the impregnation vessel but with the bottom portion via return line (14).
- 2.7 D24 supposes that this feature, namely the use of black liquor for heating and soaking in the initial phase of the cooking step, is responsible for an improvement of the quality and the strength of the pulp (column 1, lines 54 to 58).
- 2.8 The Respondent's contention that D24 was irrelevant (section VII above) is not convincing for the following reasons:
- 2.8.1 D24 relates to a process and device for continuous cooking of cellulose, especially to a process and device where heat is recovered in the form of steam (column 1, lines 5 to 15). It does, however, not identify the recovery of heat as its main objective. Instead, it is explicitly indicated that the purpose of D24 resides not only in the improvement of heat economy

of the digester but also in an improvement of the quality of the cooked pulp and in a reduction of the chemicals demand which according to the prior art cited in D24 had, obviously, not been achieved in a continuous cooking device (column 1, line 16 to column 2, line 8).

Hence, the objective underlying D24 is identical with the effects which are stated in the patent in suit to have been achieved by the claimed subject-matter, namely as providing a continuous method and a device for producing high quality pulp at improved heat economy and reduced chemicals demand (see 2.2 and 2.3 above).

2.8.2 It is true that due to the above distinguishing feature (point 2.6), the liquor exchange in D24 between impregnator and digester is different to that in the patent in suit since black liquor is already mixed with transport liquid in return line (14). It is also correct that a further consequence of the distinguishing feature is that D24 does not offer the possibility of impregnating fibre material with black liquor at the top of the impregnator.

However, considering the above identical objective underlying D24 and the patent in suit, such consequences of the distinguishing feature do not prima facie invalidate D24 as a relevant starting point for the assessment of inventive step. On the contrary, according to the established Case Law of the Boards of Appeal (5th edition 2006, I.D.2), it is exactly this distinguishing feature and the consequences implied which form the basis for identifying the technical problem actually solved by the claimed subject-matter

over the disclosure of that prior art. Whether the digester system of D24 includes an extended impregnation at the top of the digester, as argued by the Appellant, is therefore of no significance.

2.9 The Board, thus, agrees with the Appellant that D24 qualifies as a suitable starting point for the evaluation of inventive step.

2.10 No evidence is on file showing a particular effect of the claimed subject-matter when compared with the prior art according to D24.

Considering the corresponding statement on page 2, paragraph [0003] of the patent in suit, the Board however agrees with the Appellant that it is credible that the strength of the fibres in the pulp can be improved if the chips are impregnated with the black liquor already at the top of the impregnation vessel instead of adding the black liquor at the bottom. Hence, the technical problem solved by the claimed subject-matter in view of D24 can be seen in providing a digesting system suitable to produce pulp fibres of improved strength.

2.11 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, i.e. by transferring black liquor to the top of the impregnation vessel instead of to its bottom.

2.12 The Appellant drew attention to D2 and indicated its opinion that a person skilled in the art would learn therefrom that the above technical problem could be

solved by transferring spent liquor directly to the top of the impregnating vessel.

2.13 D2 also discloses a two-vessel digesting system comprising an impregnation vessel and a digester wherein the impregnation vessel may be screen less so that a con-current impregnation zone can be established in the whole impregnation vessel (in particular Figures 2 and 8 in combination with page 14, line 7 to page 15, lines 25 and page 20, line 28 to page 21, line 7).

2.14 The Respondent argued that a combination of D24 with D2 would not lead to the claimed subject-matter since the liquor supplied in D2 to the inlet portion of the impregnation vessel was not withdrawn from the first screen girdle of the digester. Further, it was apparent from Figure 2 of D2 that white liquor was added to the return line and, therefore, withdrawn before it could be used in the cooking zone.

2.15 These arguments are not convincing for the following reasons:

According to D2, the first screen girdle section consists of two screens (17) and (18) from which spent liquor is withdrawn (Figure 2). This liquor is split into an Na₂S-rich black liquor stream (up to 6 m³/ADT) which is withdrawn from the upper screen and supplied to the top of the impregnation vessel if this vessel is screen less (reference number (19'') in Figure 8) and the remaining Na₂S-weak black liquor stream (up to 6 m³/ADT) which is withdrawn from the lower screen (see also page 2, line 16 to page 3, line 10 and page 11, line 9 to page 12, line 4). It is not quite clear from

Figures 2 and 8 whether in the case of a screen less impregnation vessel the black liquor withdrawn from the lower screen is still fed into line (49) of Figure 2 and, hence, also to the top of the impregnation vessel. However, black liquor from the lower screen may, in any case, also be directed towards the top of the impregnation vessel via line (19) of Figure 2 since the withdrawal lines (19) from the upper screen and (20) from the lower screen are connected via valve 56 in order to control the amount of spent liquor flowing in each conduit (19) and (20) (page 15, lines 21 to 25).

D2 therefore discloses means for supplying a major amount of black liquor, i.e. an amount exceeding $6 \text{ m}^3/\text{ADT}$ (see claim 1 of the patent), withdrawn from the first screen girdle section to the inlet portion of the impregnation vessel.

D2 further recognises that the impact of such recirculation of black liquor to the top of the impregnation vessel consists in an improvement of the strength of the resulting pulp due to the presence of sulphides in the early stages of kraft cooking. For this purpose, it is stated in D2 that black liquor has been returned already in the cited prior art to the feed system to treat the wood chips. According to this prior art, black liquor is returned specifically to the chip chute/slurrying vessel, i.e. just before the top of the impregnation vessel (page 2, lines 4 to 15 in combination with page 8, lines 3 to 8 and Figure 2, reference number 55).

Concerning the argument that according to Figure 2 of D2 white liquor was uneconomically added to the

transfer line and withdrawn from the digester before it could be used in the cooking zone, the Board observes that no reasons are given in D2 for that particular arrangement. Therefore, there is also no reason for a skilled person aiming at an improvement of the strength of the fibres to exchange in the digesting system of D24 the arrangement of the transfer line above the white liquor supply line by the particular arrangement of D2.

2.16 The Board, therefore, finds that the skilled person, in the expectation of improving the strength of the pulp fibres would have arranged in accordance with the teaching of D2 in the two-vessel digesting system of D24 a transfer line for supplying the black liquor withdrawn from the screen girdle section to the top of the impregnator instead of supplying it to the bottom via the return line together with the transport fluid withdrawn by means of the separator.

2.17 For these reasons, the Board concludes that the subject-matter of claim 11 does not comply with the requirements of Articles 52(1) and 56 EPC.

3. Since the Respondent has not filed any auxiliary request during appeal proceedings and not even indicated any intention to do so, there is no basis on which the patent could be maintained.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

G. Rauh

P.-P. Bracke