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**Datasheet for the decision
of 2 February 2011**

Case Number: T 1907/08 - 3.3.06

Application Number: 03731867.2

Publication Number: 1470288

IPC: D21C 3/24

Language of the proceedings: EN

Title of invention:

Continuous cooking of cellulose pulp with improved heat economy

Patentee:

Metso Fiber Karlstad AB

Opponent:

Andritz Inc.

Headword:

Cellulose pulp cooking/METSO

Relevant legal provisions:

-

Relevant legal provisions (EPC 1973):

EPC Art. 54, 56

Keyword:

"Novelty: yes"

"Inventive step: yes"

Decisions cited:

T 0220/83, T 0574/91, T 0809/06

Catchword:

-



Case Number: T 1907/08 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 2 February 2011

Appellant: Andritz Inc.
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Representative: Presland, Torbjörn
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Respondent: Metso Fiber Karlstad AB
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Representative: -

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 4 August 2008
rejecting the opposition filed against European
patent No. 1470288 pursuant to Article 101(2)
EPC.

Composition of the Board:

Chairman: P.-P. Bracke
Members: P. Ammendola
J. Geschwind

Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division rejecting the opposition against European patent No. 1 470 288, claiming priority from Swedish patent application SE 0200185 and relating to continuous cooking of cellulose pulp with improved heat economy.

II. The patent as granted comprised twelve claims, whereby claim 1 read:

"1. *A method for the continuous cooking of chemical pulp with the aim of achieving improved heat economy in the digester system, in which the digester system comprises a vessel (1) for impregnation of cellulose chips and a vessel (2) for cooking the impregnated cellulose chips where the impregnation vessel (1) comprises an inlet to which a mixture of chips and process fluid is fed, where the chips are first impregnated at a predetermined impregnation temperature, T_{imp} , after which the impregnated chips are fed to the digester (2) through a transfer system (4) in order to be cooked at a predetermined temperature, T_{kok} , after which pulp that has been dissolved in the digester system is fed out through the outlet of the digester and that at least one withdrawal of black liquor is made from the digester via cooking withdrawal, preferably via cooker strainers, after part of or the complete cooking of the chips and where black liquor (14) from the said black liquor withdrawal is led to the transfer system (4) to be mixed with the*

impregnated chips for transport onwards to the top of the digester, characterised in

- *that a part of the black liquor (14) from the said black liquor withdrawal, which liquor has a withdrawal temperature T_{av} , is added to the beginning of the transfer system having maintained essentially the temperature T_{av} , with the aim of raising the temperature of the chips mixture in the transfer system (4),*
- *that at least a part of the transport fluid (10) that is continuously withdrawn at the end of the transfer system from the impregnated chips mixture that is fed into the top of the digester, and which maintains a transport temperature T_{transp} , is returned to the impregnation vessel (1) at a location that lies before the said transfer system (4), seen from the point of view of the direction of flow of the chips, such that the transport fluid (10) that has been withdrawn and that is returned to the impregnation vessel (1) is given a period as impregnation fluid in the impregnation vessel (1) for at least 40%, preferably at least 50%, of the total retention time t_{imp} of the chips in the impregnation vessel (1), and that the part of withdrawn transport fluid (10) that is returned to the impregnation vessel (1) constitutes at least 10%, preferably at least 25% and even more preferably at least 50%, of the total amount of the transport fluid withdrawn from the top of the digester."*

Claims 2 to 12 defined preferred embodiments of the method of claim 1.

In particular, claim 5 read:

"5. The method according to claim 4, characterised in that the fraction of transport fluid (10) withdrawn, which maintains a transfer temperature of T_{transp} , is returned to the impregnation vessel (1) with an essentially maintained transfer temperature T_{transp} in at least one location in the impregnation vessel."

III. The Opponent sought revocation of the patent-in-suit on the grounds of, *inter alia*, lack of novelty and of inventive step (Article 100(a) EPC 1973). During the opposition proceedings it cited, *inter alia*, the documents:

(1) = US 5,660,686

and

(2) = US 5,679,217.

The Patent Proprietor filed with letter of 15 November 2006 a set of amended claims as first auxiliary request.

IV. The Opposition Division considered, *inter alia*, that granted claim 1 required to return the transport fluid withdrawn at the end of the transfer system (hereafter the **WT fluid**) into the impregnation vessel (hereinafter the **I vessel**) at a location (hereinafter also indicated as **the return location**) sufficiently above the transfer

system to allow the WT fluid introduced into the I vessel to act as impregnation fluid for a period of at least 40% of the total impregnation time of the pulp.

The Opposition Division found, *inter alia*, that a return to the I vessel at such a return location of WT fluid maintaining the T_{transp} temperature was not disclosed in documents (1) or (2) and, thus, that these prior art methods did not anticipate the patented subject-matter.

Moreover, the skilled person could not have arrived at the patented method starting from any of documents (1) or (2).

Indeed, document (1) required the WT fluid to be returned to the bottom of the I vessel, i.e. at the beginning of the transfer system, and gave no hint to the skilled person to relocate the return of the WT fluid closer to the top of the I vessel.

In addition, document (2) only disclosed the return of the WT fluid to the I vessel in mixture with the hot black liquor and, thus, provided *per se* no hint to return separately WT fluid.

The Opposition Division also considered the Opponent's attempt to fit together documents (1) and (2), solely because they were from the same field, an unallowable *ex-post-facto* approach.

Hence, the patented subject-matter was found based on an inventive step.

V. The Opponent (hereinafter Appellant) appealed this decision.

On 1 February 2011 oral proceedings took place before the Board in the presence of both parties.

VI. The Appellant disputed in writing and orally only the findings in the decision under appeal as to the novelty and the presence of inventive step in view of documents (1) and (2).

It argued that the expression "*which maintains a transport temperature T_{transp}* " (hereinafter also indicated as **the transport temperature definition**) in granted claim 1 did not require the WT fluid to be returned to the I vessel while maintaining the same temperature that it had at the time of its withdrawal at the end of the transfer system. This would also be apparent from the wording of granted claim 5 which confirmed that the requirement of maintenance of such T_{transp} up to the entrance of the WT fluid in the I vessel was just a preferred embodiment of the patented method. Moreover, the apparatuses sketched in the Figures of the patent-in-suit contained the conduit (20) which, as apparent from paragraph [0023], allowed to feed to the I vessel the WT fluid in mixture with the hot black liquor. At the oral proceedings before the Board the Appellant additionally argued that this argument was further supported by the original wording of the Swedish patent application from which the patent-in-suit claims priority, since such original wording would state that the WT fluid possessed, rather than maintained, a transport temperature.

The Appellant also argued that granted claim 1 embraced the possibility of returning the WT fluid at any location in the I vessel preceding the feed of black liquor. Indeed, due to the possibility of countercurrent flow, even a location at the bottom of the I vessel would allow the returned WT fluid to act as impregnation fluid.

Countercurrent flow would also occur in the prior art method disclosed in document (1) in which the WT fluid fed at the bottom of the I vessel also acted as impregnation fluid.

Moreover, contrary to the finding of the Opposition Division, document (2) would not necessarily require the black liquor to be mixed with the WT fluid. This was just the specific example 1 of this prior art. Maintenance of the transport temperature was instead implied in the more general teaching provided by this citation. In any case, claim 1 of the patent-in-suit allowed for the possible feeding of the WT fluid in mixture with the black liquor and paragraph [0023] of the patent-in-suit explicitly confirmed such possibility.

Hence, the patented method was anticipated in the prior art disclosed in document (1) as well as document (2).

As to the issue of inventive step the Appellant argued that, in case the Board would instead concur with the Opposition Division's finding that the method of granted claim 1 required to return the WT fluid while retaining its transport temperature to a location in the I vessel well above the transfer system and, thus,

well above the bottom of the I vessel, still the patented method achieved no heat economy vis-à-vis the method of document (1).

Accordingly, the sole technical problem credibly solved by the patented subject-matter remained the provision of an alternative to the prior art. No inventive step would be necessary for arbitrarily modifying the return location used in the prior art method so as to arrive at the subject-matter of the claims of the patent-in-suit. In particular, this modification would be obvious in view of document (2) which already disclosed the possibility of feeding the WT fluid at the upper portion of the I vessel.

VII. The reply of the Patent Proprietor (hereinafter Respondent) to the grounds of appeal contained at page 1 the following sentence "*As a first formal request it is requested that the appeal be dismissed as being unfounded and not addressing the reasons for maintaining the patent by the Opposition Division.*".

At the oral proceeding the Respondent added thereto that the grounds of appeal were incomplete because they did not address all the points that had led the Opposition Division to the conclusion that the patented subject-matter was novel and based on an inventive step vis-à-vis documents (1) and (2).

The Respondent refuted in writing and orally the Appellant's arguments on novelty and inventive step, *inter alia*, because the wording of granted claim 1 could only be interpreted by the skilled person as requiring the WT fluid to maintain the transport

temperature up to the moment of its feeding into the I vessel. There would be no explicit or implicit contradiction between this interpretation of claim 1 and claim 5, since this latter had the aim of defining preferred embodiments characterized by the possible presence of more than one return location for the WT fluid into the I vessel and, thus, claim 5 was not just a superfluous repetition of the requirement already expressed in claim 1, as to the maintenance of the T_{transp} temperature during the return of the WT fluid. Finally, the conduit (20) of the drawings of the patent-in-suit was explicitly described in paragraph [0023] to be just a shunt line to be used during start up of the continuous process.

In the Respondent's opinion, in the method of document (1) the WT fluid was not returned to the I vessel at a location apt at producing that all the returned WT fluid acted as impregnation fluid. Moreover, in this prior art the returned WT fluid was manifestly heated through the heaters (42) sketched in Figure 2.

No maintenance of the transport temperature was also possible in the method of document (2), which only disclosed the feeding of the WT fluid in mixture with the hot black liquor.

Hence, the cited prior art did not anticipate the patented subject-matter.

Finally, the patented method achieved the aimed energy economy vis-à-vis document (1) and neither this citation nor document (2) suggested the use of WT fluid at the transport temperature as impregnation fluid.

Hence, the prior art did not render the saving in energy obtained in the patented method by means of this use obvious.

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

The Respondent requested that the appeal be dismissed or alternatively that the patent be maintained in amended form on the basis of the set of claims of the first auxiliary request filed with letter of 15 November 2006.

Reasons for the Decision

Admissibility of the appeal

1. As indicated above at section VII of the Facts and Submission the Respondent has made a "*formal request*" to the Board to dismiss the appeal as unfounded because the grounds of appeal would not address all the points that had led the Opposition Division to the conclusion that the patented subject-matter was novel and based on an inventive step vis-à-vis documents (1) and (2).

The Board interprets this as an objection to the admissibility of the appeal.

It is standard case law of the Boards of Appeal that the grounds of appeal must enable the Board to understand immediately why the decision was alleged to be incorrect, and on what facts the Appellant based his arguments, without having to make investigations on its

own (see T 220/83 OJ EPO 1986,249; T 574/91 and T 809/06, not published in the OJ EPO).

In the present case, even if the Appellant's statement setting out the grounds of appeal filed with letter of 15 December 2008 has not addressed all the points of the reasoning of the Opposition Division's decision, this statement enables the Board to understand why the decision under appeal is alleged to be incorrect and on what facts the Appellant bases its arguments for requesting that the decision be set aside and the patent be revoked.

Where irrelevant or ill-founded arguments brought in support of the grounds of appeal might lead to an unsuccessful outcome of the appeal, or perhaps even the dismissal of the appeal, they do not of themselves render an appeal inadmissible within the meaning of Article 108 EPC.

Thus, the Board finds the appeal admissible, regardless as whether the grounds of appeal may or not be relevant enough for reversing the whole reasoning in the appealed decision leading to the conclusion that the patented subject-matter was found novel and based on inventive step vis-à-vis document (1) and document (2).

Patent as granted (Main request)

2. Novelty: claim 1 as granted (Article 100(a) in combination with Articles 52(1) and 54(1) and (2) EPC 1973)
 - 2.1 The Board concurs with the Respondent and the Opposition Division that claim 1 as granted (see above

section II of the Facts and Submissions) defines a method for the continuous cooking of cellulose pulp that comprises impregnating cellulose chips (before their actual cooking) with black liquor taken from the digester, and in which the black liquor is firstly used for forming the transport fluid present in the transfer system located between the bottom of the I vessel and the top of the digester, and then (in part) withdrawn from the end of the transfer system (as WT fluid) and finally returned to the I vessel. The return of the WT fluid is described in claim 1 by stating that *"at least a part of the transport fluid (10) that is continuously withdrawn at the end of the transfer system ... and which maintains a transport temperature T_{transp} , is returned to the impregnation vessel (1) at a location that lies before the said transfer system (4), seen from the point of view of the direction of flow of the chips, such that the transport fluid (10) that has been withdrawn and that is returned to the impregnation vessel (1) is given a period as impregnation fluid in the impregnation vessel (1) for at least 40% ... of the total retention time t_{imp} of the chips in the impregnation vessel (1)"*. Thus, in the opinion of the Board, this claim requires the WT fluid to be returned - while maintaining the " T_{transp} " - at a specific return location in the I vessel that is above the transfer system and is apt at allowing the returned WT fluid to act as impregnation fluid for a substantial fraction of the total impregnation time. It is also apparent from claim 1 and manifestly consistent with the technology in this technical field that the transport temperature of the WT fluid must necessarily be intermediate between the " T_{av} " of the hot black liquor and the temperature of impregnation in the I vessel.

2.1.1 The Appellant has disputed in part this interpretation of claim 1 as granted by arguing that

- the intrinsic ambiguity of the definition of the transport temperature in the claim;
- the possibility of mixing the WT fluid with the black liquor in the patented method explicitly described in the patent-in-suit in paragraph [0023] with reference to the conduit (20) in both the Figures;
- the wording of granted claim 5;

and

- the original text of the Swedish priority application,

would render evident that the claim only requires the WT fluid to "possess" or "have" an undetermined transport temperature at the moment of its withdrawal from the end of the transfer system (i.e. from the top of the digester).

The Appellant has also argued that in any embodiment of the claimed method the WT fluid returned to the I vessel would (at least initially) flow countercurrent, since its temperature is certainly superior to the temperature inside the I vessel. Therefore, even a return location at about the bottom of this vessel would allow the returned WT fluid to act as impregnation fluid.

Accordingly, in the Appellant's opinion granted claim 1 would embrace the possibility of returning to **any location** in the I vessel the WT fluid **at any temperature** and, possibly, **even in mixture** e.g. with hot black liquor.

- 2.1.2 The Board finds, however, that the transport temperature definition in granted claim 1 can only be interpreted taking into account that the verb used therein is "maintains", and not "has" or "possesses".

The Board considers also relevant in this respect that the other expressions containing the verb "maintain" which are present in the very same claim 1 (see the passage relating to " T_{av} ") as well as in claim 5 as granted (see above de section II of the Facts and Submissions) explicitly define constancy of temperature during a certain operation, i.e. over a prolonged time interval, rather than just for indicating the presence of a certain temperature in a single instant.

The Board notes further that the disclosure at paragraph [0023] explicitly only refers to the optional use of the shunt line (20) during start up (i.e. until continuous operation is commenced). Moreover, it is apparent to the Board that in the context of the patent-in-suit the shunt line (20) only disclose the possibility of (initially) introducing a mixture of WT fluid and hot black liquor **at the beginning of the transfer system** in the I vessel, and not to a return location in the I vessel that is above such transfer system and apt at ensuring that the whole returned WT fluid acted as impregnation fluid. Hence, paragraph [0023] is irrelevant for the interpretation of the

definition of the transport temperature contained in the passage cited above at point 2.1.

The Board's interpretation of the wording "*maintains a transport temperature*" in granted claim 1 does not even necessarily imply that claim 5 as granted would just represent a superfluous repetition of this feature, since claim 5 does not just describe (in an unambiguous manner) the maintenance of the " T_{transp} ", but also stresses the possibility of a plurality of return locations (see in claim 5 the wording "*at least one location*").

Hence, in the opinion of the Board, the person skilled in the art can only interpret the transport temperature definition in granted claim 1 as the requirement of substantially constant temperature for the WT fluid, from the moment of its withdrawal at the end of the transfer system to its feeding at the return location into the I vessel.

As to a different transport temperature definition allegedly present in the priority application, the Board considers not justified to construe granted claim 1 as if it should necessarily define the same subject-matter already defined in the priority application. The Board notes indeed that neither the EPC nor the current practice in claiming priority rights require that the content of a European patent or European patent application should not extend beyond that of the national patent application from which the European patent or patent application claims priority. Hence, any difference in wording between the priority application and the claims of the patent-in-suit could

for instance originate from the decision of the Respondent to (also) claim in the patent-in-suit matter not disclosed in the priority application. Thus, the content of the Swedish patent application from which the patent-in-suit claims priority is found irrelevant for the interpretation of the transport temperature definition in granted claim 1.

2.2 The Appellant has disputed the novelty of the method of granted claim 1 by making reference to the prior art disclosed e.g. in Figure 2 of document (1) and that disclosed in general description of document (2). In particular, the Appellant has referred to the lines 41 to 45 of the section with heading "*Summary of the invention*" in column 2 of document (2) reading "*The apparatus comprises a conduit constructed and arranged between the top of the digester and the pre-impregnation vessel, whereby a portion of a liquor present in the top of the digester is transferred to the pre-impregnation vessel*". As this passage is silent as to the need of mixing the WT fluid (i.e. the "*liquor present in the top of the digester*") with the black liquor taken from lower sections of the digester, the Appellant considered implied therein that the WT fluid was transferred to the I vessel without mixing it with the hot black liquor, i.e. maintaining the " T_{transp} ".

The Board finds instead that none of these two documents describes the return of the WT fluid **at the transport temperature**.

Indeed, it is undisputed that in Figure 2 of document (1) the line (41) used for returning the WT fluid to the I vessel passes through the heaters (42).

Moreover, the only detailed description in document (2) of the return of the WT fluid to the I vessel is that given in example 1 with reference to the sole drawing in this citation. From this disclosure it is apparent that the WT fluid, i.e. the fluid passing through the conduit 10, is combined with the black liquor (arriving from the screen section 8) in the conduit 11 (see also in document (2), column 4, lines 11 to 18) and thus no maintenance of the transport temperature of the WT fluid is disclosed in this example of the prior art. The general description at column 2 of this citation referred to by the Appellant is just silent as to the temperature of the WT fluid during its return to the I vessel. Hence, also the general description in this citation does not amount to a direct and unambiguous disclosure of such feature of the patented method.

Already for these reasons the Board comes to the conclusion that the subject-matter of claim 1 is not anticipated by the cited prior art.

3. Inventive step for the subject-matter of claim 1 as granted (Article 100(a) in combination with Articles 52(1) and (2), and 56 EPC 1973).
- 3.1 The patent-in-suit addresses the technical problem of achieving heat economy during impregnation of cellulose chips with black liquor.
- 3.2 The Board notes that also document (1) discloses e.g. with reference to Figure 2 a method for continuously cooking cellulose pulp in which black liquor withdrawn from the digester is fed to the I vessel to act (also)

as impregnation fluid. Hence, the Board concurs with the parties that this prior art represents a suitable starting point for the assessment of inventive step.

- 3.3 As already indicated above at point 2.2, the subject-matter of claim 1 as granted differs from this prior art at least in that the former requires the return of the WT fluid at the transport temperature.

The Respondent has maintained that this feature of the patented subject-matter results in the solution of the posed technical problem.

The Appellant has argued instead that the method of the invention represents just an alternative to the prior art, deriving from an arbitrary modification of this latter not providing any technical advantage.

It has turned out unnecessary for the Board to establish which is the technical problem actually solved by the claimed method vis-à-vis the prior art, because the Board has come to the conclusion that even if the claimed method only represented an alternative to the prior art, still it was not obviously derivable from the cited documents.

Indeed, it is immediately apparent to the Board in view of the interpretation of granted claim 1 already made in the discussion of novelty that neither document (1) *per se* nor its combination with document (2) can possibly render obvious the modification of the method of document (1) needed for arriving at patented subject-matter.

As a matter of fact, whereas claim 1 of the patent-in-suit requires to feed the WT fluid **at its temperature** to the I vessel in order to act as impregnation fluid, in document (1) and in document (2) the WT fluid is **always heated** before returning it to any preceding location in the digester system (by using heaters and/or by mixing it with the hot black liquor, see the above discussion on novelty).

Hence, these citations, *per se* or in combination, cannot possibly render obvious to use the WT fluid **as such** (i.e. at its relatively low temperature) for impregnating the cellulose chips. On the contrary, the skilled reader of documents (1) and/or (2) would be prompted to consider the transportation temperature too low for allowing the direct use of the WT fluid as impregnation fluid.

- 3.4 Therefore, the Board concludes that the prior art cited by the Appellant does not render obvious the method of claim 1 as granted.

Hence, the subject-matter of this claim is found based on an inventive step and, thus, to comply with the requirements of Article 56 EPC 1973.

4. Novelty and inventive step for the subject-matter of claim 2 to 12 as granted (Article 100(a) in combination with Articles 52(1) and (2), 54(1) and (2), and 56 EPC 1973).

The reasoning given above in respect of the novelty and the non-obviousness of the method of claim 1 applies

also to the preferred embodiments of this latter as defined in granted claims 2 to 12.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Magliano

P.-P. Bracke