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# D E C I S I O N
## of 18 February 2003

**Case Number:** T 0391/00 - 3.3.6

**Application Number:** 93922969.6

**Publication Number:** 0672209

**IPC:** D21C 9/153

**Language of the proceedings:** EN

**Title of invention:**
Method and apparatus for bleaching pulp

**Patentee:**
Andritz Oy

**Opponent:**
Kvaerner Pulping AB
Metso Paper Sundsvall AB

**Headword:**
Pulp Bleaching/ANDRITZ

**Relevant legal provisions:**
EPC Art. 54(2)(3), 56, 84, 123(2), 114(2)

**Keyword:**
"Late-filed document - not admitted"
"Auxiliary requests: admissibility of amendments - yes"
"Novelty (all requests) - yes"
"Inventive step (all requests) - no"

**Decisions cited:**
-

**Catchword:**
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**Case Number:** T 0391/00 - 3.3.6

**D E C I S I O N**
**of the Technical Board of Appeal 3.3.6**
**of 18 February 2003**

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**Decision under appeal:** **Decision of the Opposition Division of the European Patent Office posted 11 February 2000 revoking European patent No. 0 672 209 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** P. Krasa

**Members:** G. Dischinger-Höppler
C. Rennie-Smith

## Summary of Facts and Submissions

I. This appeal is from the decision of the Opposition Division to revoke European patent No. 0 672 209 for lack of inventive step. The decision was based on amended claims according to a main and two auxiliary requests. The only independent claim of the main request reads:

"1. A method of bleaching medium consistency pulp with ozone where ozone is added as a mixture of ozone and a suitable carrier gas such as oxygen, nitrogen or air, said method comprising, in the same stage, the steps of:

a) mixing said mixture of ozone and carrier gas in an amount of 2-5 $m^3$/adt with pressurized pulp in a first fluidizing mixer to form a foamy mixture of pulp, ozone and carrier gas;

b) transferring said foamy mixture of pulp, non-reacted ozone and carrier gas to a second fluidizing mixer;

c) refluidizing said mixture of pulp, unreacted ozone and carrier gas in said second fluidizing mixer;

d) transferring said foamy mixture of pulp, residual ozone and carrier gas to step e);

e) separating residual gas comprising mainly carrier gas and residual ozone from said mixture after ozone having had sufficient time to react with the pulp."

This claim differs from Claim 1 as granted only by the addition of the term ", in the same stage," in the preamble of the claim.

II. Two notices of opposition based on lack of novelty and inventive step (Articles 100(a), 54, 56 EPC) cited inter alia the following documents:

(1) EP-B-0 397 308,

(2) C.-A. Lindholm, "Effect of pulp consistency and pH in ozone bleaching", Paperi ja Puu - Papper och Trä, 3/1987, pages 211 to 218; and

(11) WO-A-93/07961,

whereas the Proprietor relied on document

(10) H. Dahllöf, "Current Projects with Ozone Bleaching", 10 pages "To be presented at the Air Liquide Ozone Symposium", Denmark, 28 to 29 September 1995.

III. In its decision, the Opposition Division found that the subject-matter claimed according to the amended main request was novel but not inventive in view of document (1) as the closest prior art. Two auxiliary requests were held inadmissible under Rule 57a EPC and Article 123(2) EPC respectively. The Opposition Division held in particular that it was obvious to use in the method disclosed in document (1) a second fluidizing mixer immediately after a first one and before the gas separation step, in order to add to that prior art a further method with additional mixing for improving the reaction rate of ozone at low equipment

costs.

IV. With its statement of grounds of appeal and with its letter dated 17 January 2003, the Appellant (Proprietor) filed amended claims in new first and second auxiliary requests.

Claim 1 of the first auxiliary request differs from granted Claim 1 by reading in step b): "transferring said foamy mixture ... to a second fluidizing mixer **via a flow channel**" (emphasis added). Claim 1 of the second auxiliary request additionally differs by step d) reading: "transferring said foamy mixture ... to step e) **via a flow channel**" (emphasis added).

V. With its only letter dated 3 February 2003, Respondent I (Opponent I) filed the following new document:

Shinichiro Kondo, "Two Stage MC-Oxygen Delignification Process and Operating Experiences, Proceedings, 1992 Pan-Pacific Pulp & Paper Technology Conference, Part A, September 8-10, 1992, Tokyo, pages 23 to 31.

VI. Oral proceedings were held before the Board of Appeal on 18 February 2003.

VII. The Appellant's arguments, in writing and at the oral proceedings, can be summarised as follows:

- The claimed subject-matter was not only novel over the cited prior art, especially documents (1) and (11), but also involved an inventive step.

- It was evident from document (10) that the claimed method improved bleaching efficiency over the

method shown in Figure 2 of document (1). As regards Figure 3 of document (1), it was self-evident that the claimed method additionally reduced equipment and energy costs.

- Those advantages were achieved by the distinguishing features, namely by using a gas volume of 2 to 5 $m^3$/adt and two directly successive mixing steps within one single bleaching stage.

- Whilst the late-filed document should not be admitted into the proceedings, none of the prior art documents filed in due time gave a skilled person any incentive to modify the process of document (1) so that two mixers could be used without any gas removal between them in order to improve bleaching efficiency over Figure 2 of document (1) and, in addition, to reduce equipment and energy costs over Figure 3.

VIII. The arguments of Respondent I were in summary as follows:

- The claimed subject-matter was not novel over document (1) since it covered the possibility that the second mixer was a degassing mixer such as a gas removing medium consistency (MC) pump as used in Figure 3 of document (1) and since the amount of gas in document (1) fell within the claimed range of 2 to 5 $m^3$/adt if the same pressure of up to 15 bar as in the patent in suit was applied.

- Figure 9a of document (11) also anticipated the claimed method. The fact that according to this Figure bleaching gas was also introduced into the

second mixer was no distinguishing feature since this feature was not excluded by the wording of Claim 1 of the patent in suit.

- The new filed document (V above) was highly relevant to the present case as it disclosed the using of two mixers in series and the direct transfer of the pulp via flow channels from the first to the second mixer and from the second mixer to the reactor and gas separator which would further substantiate that the claimed subject-matter lacked novelty or alternatively inventive step over the cited prior art.

- It was generally known in the art that the reaction rate of the ozone increased with improved mixing of gas and pulp and that the problems of mixing decreased with decreasing gas volume. Therefore, the claimed subject-matter was not inventive over document (1).

- The same arguments as to novelty and inventive step applied to the claims of the auxiliary requests.

IX. Respondent II agreed with the arguments put forward by Respondent I and added the following:

- The use of flow channels between the mixers and between the second mixer and the gas separation device was originally not disclosed in relation to the amounts of gas to be used which were lower than those disclosed in document (1). In this respect, the amendments made to the claims of the auxiliary requests were open to objection under

Articles 84 and 123(2) EPC.

- The terms "comprising" and "said mixture" used in Claim 1 did not exclude the presence of other steps between the two mixers. Consequently, Claim 1 also read onto the bleaching methods disclosed in document (1).

- The problem to be solved by the claimed subject-matter in view of document (1) could be seen as improvement of the efficiency of the ozone bleaching. Whilst it was obvious from document (2) to improve the mixing for that purpose, document (10) dealing with ozone consumption in relation to the ozone concentration in the gas, had no bearing on the bleaching method according to the patent in suit.

X. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or on the basis of its first auxiliary request filed on 21 June 2000 or its second auxiliary request filed on 17 January 2003.

The Respondents requested that the appeal be dismissed.

## Reasons for the Decision

1. *Late filed evidence*

1.1 Two weeks before the oral proceedings before the Board of Appeal, Respondent I for the first time sought to rely on a new document relating to a Conference held in Tokyo in September 1992 (see V above). The only reason

given for doing so was that this document was discovered to be highly relevant for the present case during the final preparation before oral proceedings in an opposition case in Sweden scheduled for 6 February 2003.

According to its own submissions, the Respondent had, however, been familiar with this document since March 1998, that is about half a year before it filed opposition in the present case.

1.2 Pursuant to Article 114(2) EPC, the Boards of Appeal often admit late-filed evidence into the proceedings, provided that it is prima facie and at first sight more relevant with regard to the claimed invention than the citations already on file, to the extent it might change the outcome of the decision to be taken by the Board and that it is beyond any doubt that such evidence was publicly available at the priority date of the patent in suit.

1.3 In the present case, these requirements are not met.

1.3.1 The late-filed document is an undated conference report and relates to a two stage MC-oxygen delignification process (title on page 23). Ozone treatment of pulp, the specific technical field of the patent in suit, is not mentioned. In contrast, the documents filed in time, in particular documents (1) and (2), actually concern or explicitly refer to MC-ozone bleaching of pulp and the difficulties involved. Thus, it is not prima facie apparent that the late-filed document is technically more relevant than the documents already on file.

1.3.2 Moreover, the Respondent did not provide any evidence as to whether and when the document had ever been made actually available to the public.

1.4 For these reasons, the Board holds that the late-filed document is not to be taken into consideration pursuant to Article 114(2) EPC.

2. *Interpretation of the claims and admissibility of amendments in the auxiliary requests*

2.1 Objections under Articles 84 and 123(2) EPC have been raised against the introduction into Claim 1 of the auxiliary requests of the features concerning transfer of the mixture of gas and pulp from the first to second mixer and from the second mixer to the gas separator "via a flow channel". It was argued that this feature was originally only disclosed in as much it was suggested that the amount of gas introduced into the first mixer was larger than that introduced into the mixer used in the method disclosed in document (1). Reference was made to page 3, line 36 to page 4, line 17 of the application as filed.

Since the amount of 2 to 5 $m^3$ gas/adt was, however, smaller than the lowest amount of about 7 $m^3$/adt mentioned in document (1), it was argued the amendments were not supported by the original description.

For the same reason, it was argued the claims of the auxiliary requests lacked clarity should the amount of 2 to 5 $m^3$ gas/adt be considered as a distinguishing feature in relation to document (1).

2.2 The Appellant argued that the introduction of said

features was made merely to clarify further that transfer of the gas/pulp mixture was made directly with no other steps in between. Moreover, it was evident that the discrepancy concerning the amount of gas used according to document (1) in comparison with that used according to the patent in suit was based on a misinterpretation of document (1).

2.3 The Board accepts the Appellant's arguments for the following reasons:

2.3.1 Claim 1 of the main request and both auxiliary requests is based on original Claims 1, 5, 8 and 13 in combination with page 4, lines 19 to 28 of the original description, where the amount of 2 to 5 $m^3$ gas/adt is disclosed. The original claims are so worded as to disclose that **the** mixture (or **said** mixture) obtained in the first mixer is transferred to the second mixer and from there to the gas separator. This wording is, in the Board's opinion, unambiguous and in itself clear and sufficient to indicate that nothing is added or withdrawn from the mixture in the course of carrying out steps a) to e) of Claim 1. In such circumstances, the wording of the claims would not, normally, require interpretation in the light of the original description.

Moreover, there is ample support for such a direct transfer between the steps in the application as filed. It is in particular illustrated in the original Figures 1, 2, 5 and 6 of the application as filed, where it is shown that the mixture of gas and pulp is transported via pipelines (possibly including a reactor) between the mixers and to the gas separator with no further inlet or outlet conduits.

The Board has not overlooked that, according to the original description of Figure 5 (page 7, lines 1 to 14), it is possible that "if desired or necessary, the mixers 16 and 52 can be pumping and/or degassing mixers presupposing that the length of the preceding reaction zone is adequate". Mixer 52 is the **third** mixer in the apparatus. Therefore, the above interpretation holds good if this **third** mixer 52 is used for degassing. Moreover, as argued by the Appellant and accepted by the Board, the functioning of a mixer suitable for pumping and/or degassing depends on the way it is used. Therefore, this paragraph does not necessarily mean that gas is separated from the pulp already in the second mixer 16.

On the other hand, original Figure 4 and the corresponding description on page 6, last paragraph, include the possibility of adding ozone in both the first and second mixer if a third fluidising mixer in series is present. Since this piece of information has remained basically unchanged in the patent in suit (Figure 3 and column 4, lines 33 to 47), the wording of the claims of the main request must be interpreted to extend to such an embodiment, whereas the claims of the auxiliary requests have been restricted so as to exclude this embodiment.

2.3.2 Neither the figures nor the claims as originally filed require that the bleaching method concerned only operates with larger amounts of gas than in document (1).

The paragraph referred to by the Respondents (page 3, line 36 to page 4, line 17) in respect to Figure 1 relates to the apparatus according to that Figure as

disclosed in the previous paragraph (page 3, lines 15 to 34). It describes the operation of that apparatus and it is indeed said that the volume of gas mixed into the pressurized pulp via fluidizing mixer 14 is **clearly larger** than in the method of document (1) which is why it cannot be properly mixed with the pulp but large bubbles remain in the pulp which are broken up by the second fluidizing mixer to form a foamy mixture as in document (1). However, in the following paragraph (page 4, lines 19 to 28), it is stated that "this kind of reactor application allows mixing efficiently 3 to 5 $m^3$/adt of gas into the pulp" and that additional mixing in the reaction vessel should be provided for, if larger volumes of gas are to be used, but preferably already when the gas doses exceed 2 to 3 $m^3$/adt.

Consequently, the operation of the apparatus of Figure 1 is not restricted to the use of larger volumes of gas than in document (1) but clearly discloses also the use of gas volumes of 2 to 5 $m^3$/adt as claimed in all requests.

Therefore, the Board concludes that the amendments made to the claims of the auxiliary requests do not offend the requirements of Article 123(2) EPC.

2.3.3 As concerns the objection under Article 84 EPC, the Board agrees that the claims and some parts of the description might be contradictory as regards the amount of gas to be used. However, this is not the result of the amendments made in the auxiliary requests. The contradiction existed already in the claims as granted which included the amount of 2 to 5 $m^3$/adt as an essential feature and is due to the contradictory statements in the original description

that, on the one hand, the amount of gas is clearly larger than in document (1) and, on the other hand, that efficient mixing is obtained with 2 to 5 $m^3$ gas/adt.

The Board holds, therefore, that the amendments made to the auxiliary requests do not **create** a problem under Article 84 EPC.

3. *Novelty*

3.1 Main request

Novelty of the subject-matter of Claim 1 has been contested in view of document (1) under Article 54(2) EPC and in view of document (11) under Article 54(3) EPC.

3.1.1 Document (1) does not disclose the amount of 2 to 5 $m^3$/adt of gas to be mixed into the pulp. The only values given in document (1) are about 70, 14 and 7 $m^3$/adt. They show for particular conditions (10% consistency, 1% ozone/adt and 10% concentration of ozone in oxygen) how the gas volume decreases if the pressure is increased from 1 bar to 5 or 10 bar (page 3, lines 20 to 26 and Table I).

According to the Respondents' opinion the amount of gas given in Claim 1 was meaningless since no pressure to be applied was indicated. Moreover, the amounts mentioned in document (1) fell within the claimed range, if the applied pressure was increased up to 15 bar.

However, this upper limit is mentioned in the patent in

suit (column 4, lines 8 to 12) but not in document (1). The Board further holds that an amount of gas expressed by volume ($m^3$) as in the present case is a distinct and concrete feature. Of course, the gas mass comprised in such volume depends on the pressure applied. This is however irrelevant to the question of novelty in the present case, where the mass of the gas does not play any role. Thus, if no pressure is indicated, the amounts of gas relate to any pressure usually applied in the technical field of MC ozone bleaching and in particular to pressures as indicated in the description of the patent (column 4, line 10).

Further it is not permissible, for the purpose of a novelty attack, to supplement certain information on which the citation is silent (here: a pressure above 1 bar) by a feature which is only disclosed in the patent in suit. Since, contrary to the patent in suit, document (1) does not contain the advice that pressures above 10 bar should or could be used, it follows that document (1) does not anticipate the subject-matter of Claim 1.

3.1.2 Concerning document (11), the novelty objection was based on Figure 9a illustrating an embodiment with two mixers in series. As is apparent from the Figure as well as from the corresponding part of the description (page 19, line 35 to page 20, line 23), a bleaching chemical is introduced into both mixers. In particular it is stated to be characteristic of the process that the volume of gas to be introduced into the second mixer is greater than that to be supplied to the first mixer. In contrast to the claimed method (see 2.3.1 above), no third mixer is present in that event. Document (11) does not, therefore, anticipate the

subject-matter of Claim 1 either.

3.2 Auxiliary requests

The same considerations apply to the subject-matter claimed in the auxiliary requests since the amendments made therein represent merely a further clarification of the fact that transfer of the mixture is made directly between steps a) and e) (see 2.2 and 2.3 above).

3.3 The Board is, therefore, satisfied that the claimed method according to any of the requests is novel over documents (1) and (11). With respect to the other citations, it is sufficient to state that they do not anticipate the claimed process either. Since the appeal fails for other reasons, it is not necessary to give further details here.

4. *Inventive step (main request)*

4.1 Technical background

The patent in suit is concerned with the general technical problem in the field of bleaching pulp with ozone at MC conditions where large amounts of gas are to be mixed with pulp. It is said that large volumes of gas are not properly mixed with the pulp in a fluidizing mixer. Instead, large bubbles of gas remain in the pulp (column 1, lines 5 to 11 and column 3, lines 21 to 24).

According to the patent in suit, processes are known which use for that purpose several mixers connected in series and in which fresh ozone containing gas is

introduced into each mixer (column 1, lines 15 to 51). Document (1) is particularly referred to as describing such a method and it is stated that this document further requires separation of gas between the mixers (column 1, lines 22 to 41).

4.2 Closest prior art

All parties rely on document (1) as the closest prior art and the Board also agrees that document (1) qualifies as a suitable starting point for assessing inventive step, since it is also concerned with the problem of mixing the ozone containing gas into MC pulp (page 2, lines 17 to 22). In particular it is stated in document (1) that, at MC conditions, gas cannot move freely in the pulp but that the conditions for good mass transfer have now been created (page 2, lines 47 to 48).

Thus, document (1) discloses a method of bleaching MC pulp with ozone contained in oxygen as a carrier gas comprising the steps of

- mixing the ozone containing oxygen with pulp under intense agitation and a pressurized state of 1 to 10 bar in a fluidizing mixer to form a foamy mixture,

- transferring the foamy mixture to a reaction vessel and

- therefrom to a gas separator (Claims 1 and 4, page 3, lines 16 to 19 and 44 to 52).

This basic process is represented in Figure 2 showing

an MC pump for pumping MC pulp connected via a channel with the fluidizing (intensive) mixer into which ozone gas is introduced, the mixer being connected to a reactor which again is connected to a gas separation device where separated gas is withdrawn. All connections are shown in the form of pipelines or flow channels.

In the event the amount of ozone to be introduced is so large that it is not advantageous to add it all at the same time, it is suggested to repeat the above basic bleaching stage. Two successive bleaching stages are shown in the flow sheet of Figure 3 consisting of the following devices connected in series: MC pump - fluidising mixer with gas inlet - reactor - gas separation (e.g. gas-removing MC pump) with gas outlet - second fluidising mixer with gas inlet - reactor - gas separation with gas outlet.

4.3 Technical problem and solution

4.3.1 According to the Appellant, the correct starting point in document (1) should be the bleaching process shown in Figure 3 since this disclosed more than one fluidising mixer. Via the omission of an intermediate gas separation device, the technical problem actually solved by the claimed subject-matter in view of this embodiment consisted, so the Appellant argued, in an improvement of the bleaching efficiency and a reduction of equipment and energy costs (see also column 2, lines 9 to 23 of the patent in suit).

4.3.2 However, as is shown in Figure 5 of the patent, the application of a second bleaching stage is not excluded from the patent in suit. It is apparent from this

Figure that gas is separated from the pulp after the first reactor and fresh ozone is introduced thereafter and before a second reactor via another fluidizing mixer.

Apart from the particular amount of gas of 2 to 5 $m^3$/adt, the claimed subject-matter as illustrated in Figure 5 of the patent differs from the embodiment shown in Figure 3 of document (1) only by using a second mixer in the first bleaching stage. Therefore, even if the Board were to accept - for the sake of argument - the embodiment shown in Figure 3 of document (1) as the starting point for evaluating inventive step, it must follow that equipment and energy costs are actually increased, rather than reduced, by the claimed method.

4.3.3 It also follows that the correct starting point for assessing inventive step of the subject-matter as claimed in the patent in suit is Figure 2 of document (1) which shows a possible way of carrying out one single ozone bleaching stage (see also page 3, lines 46 to 52).

The Appellant conceded that in this case the technical problem in view of document (1) was reduced to improving the bleaching efficiency as defined by the ratio of brightness increase (or kappa number reduction) per kilogram of ozone employed. It was shown in document (10) that this problem was actually solved by the introduction of a second mixer and by introducing gas volumes of 2 to 5 $m^3$/adt into the pulp. It did not matter that, in this respect, document (10) referred to the increase of ozone consumption instead of bleaching efficiency, since in principle both terms

mean the same as far as the influence of proper mixing is concerned.

4.3.4 The Board agrees with this understanding of the terms, in particular since it is not apparent that mixing has any influence on the selectivity of ozone bleaching. It follows that the technical problem to be solved in view of document (1) can be seen in providing a process with improved bleaching efficiency by improving the ozone consumption.

4.3.5 Document (10) is a post-published document and may be used here only to evaluate whether it is plausible that the technical problem is actually solved by the means claimed. Particular reference has been made to Figure 2 which refers to "Calculated ozone consumption using different mixing alternatives". The Appellant argued that the figure shows the results of experiments carried out with ozone concentrations of 7% in the carrier gas as mentioned on page 2, first line, and at 10 bar (g), a gas/liquor ratio of between about 0.34 to 0.55 and using one or two mixers in series, whereas the calculations only refer to the ozone charge (in kg/adt) which is necessary for a particular gas/liquor ratio if, at 10 bar (g), the ozone concentration was either 12% or 14%.

In principle, the figure shows that ozone consumption decreases for any number of mixers with increased gas/liquor ratio and with increased ozone charge (kg/adt) for a particular ozone concentration but increases with an increased number of mixers. In the figure, the gas/liquor ratio and the calculated ozone charges are on the X-axis and the ozone consumption is on the Y-axis. The figure only shows gas/liquor ratios

up to 0.7 and ozone charges up to about 11 kg/adt. It is, however, apparent that the graph is not limited here. Extrapolation of the data given allows one to expect that using two mixers instead of one would also increase the ozone consumption for higher gas liquor ratios and higher ozone charges. The Board, therefore, concludes that document (10) also suggests that using more than one mixer in series would also increase ozone consumption for the gas/liquor ratios of 1.0 or higher in document (1) (see Table 1), albeit at lower consumption values. Document (10) further shows that these benefits are not only achieved with gas doses within the claimed range of 2 to 5 $m^3$ gas/adt. On the contrary, extrapolation of the ozone charge axis, e.g. for 12% ozone concentration and 10 bar (g), indicates that, by using two mixers, ozone consumption would also be improved with gas doses outside the claimed range.

Thus, document (10) cannot demonstrate that the gas volume used per adt is critical and not arbitrary or, in other words, that it contributes to the effect achieved.

4.3.6 The Board therefore accepts that the problem set out above in view of document (1) is solved by the application of two mixers in series but does not see any other relationship with the amount of gas to be used than that it may be sufficient with small amounts of gas to use one mixer to get proper mixing and, therefore, good ozone consumption, whereas with higher gas doses two mixers may be necessary to achieve the same ozone consumption.

4.4 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 technical problem by the means claimed, i.e. by the application of a second mixer and by using gas in an amount of 2 to 5 $m^3$/adt.

4.4.1 It follows from the above that no particular advantage can be attributed to the claimed range of gas doses, except that better consumption is achieved with smaller amounts of gas. It is, however, well-known in the art that the reactivity between ozone and pulp, i.e. the ozone consumption, under MC conditions largely depends on proper mixing which is problematic in view of the large volumes of gas involved (document (2), page 216, paragraph bridging the left-hand column and the middle column). The Board therefore holds that a skilled person would have expected that, the smaller the gas volumes used, the better would be the resulting bleaching efficiency due to the fact that a more intensive mixing and, correspondingly, higher reactivity can be obtained.

4.4.2 This theory derived from document (2), that intensive mixing (fluidization) is necessary to provide sufficient reactivity between ozone and pulp at MC conditions is confirmed by the teaching of document (1) which states that good mass transfer between ozone and fibres is a prerequisite for a successful MC bleaching (page 2, lines 20 to 22 and 45 to 48). Nevertheless, document (1) shows that, in spite of intense agitation in a fluidizing mixer, the foamy mixture tends to collapse and gas can separate again. In order to prevent such separation of gas, it is suggested to use a second kind of mixer after the first one which

lightly agitates the fluidized mixture (page 3, lines 43 to 52).

4.4.3 The Board accepts the Appellant's only argument in this respect, namely that light agitation is different from fluidization. However, given the above information in document (1) that one fluidizing mixer might not be sufficient for a proper mixing or to keep the mixture long enough in the fluidized state, the Board considers the use of a second fluidizing mixer instead of the light agitation in document (1) to be an obvious option if the skilled person realizes that "large bubbles remain in the pulp" after the treatment in a first fluidizing mixer or that the light agitation proposed in document (1) is insufficient to keep the foamy mixture in the fluidized state required for reaction between ozone and pulp.

4.5 Therefore, the Board concludes that, for the purpose of improving the bleaching efficiency of the process disclosed in document (1), the skilled person would, with a reasonable expectation of success, have tried to perform the process with a lesser volume of gas and with a second fluidising mixer after the first instead of the light agitation recommended in document (1).

Consequently, the subject-matter of Claim 1 of the main request lacks an inventive step and does not meet the requirements of Article 56 EPC.

4.6 Auxiliary requests

The amendments made to the claims in the auxiliary requests are not suitable to distinguish the claimed subject-matter further over document (1) and, hence,

not able to add any new aspect with regard to inventiveness (see 3.2 above). Therefore, the same conclusions as drawn for Claim 1 of the main request apply mutatis mutandis to Claim 1 of both the first and second auxiliary requests.

## Order

## For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Rauh P. Krasa