BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 25/89 - 3.2.2

Application No.: 80 300 728.5

Publication No.: 0 017 353

Title of invention: Production of paper and paper board

Classification: D21D 3/00

D E C I S I O N
of 7 May 1991

Proprietor of the patent: Allied Colloids Limited

Opponent: 01: BASF Aktiengesellschaft
02: Erbslöh Geisenheim GmbH & Co.

EPC Articles 54, 56, 84

Keyword: "Novelty and inventive step (yes, after amendment)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 25/89 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 7 May 1991

Appellant 01 : (Opponent 01)
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Decision under appeal :
Interlocutory decision of the Opposition Division of the European Patent Office dated 25 October 1988 concerning maintenance of European patent No. 0 017 353 in amended form.

Composition of the Board :

Chairman : G. Szabo
Members : P. Dropmann
F. Benussi

Summary of Facts and Submissions

I. European patent No. 0 017 353 claiming priority date of 28 March 1979 was granted on 16 November 1983 on the basis of European patent application No. 80 300 728.5 filed on 10 March 1980.

II. Two oppositions were filed against this patent on the grounds of lack of novelty and inventive step (Article 100(a) EPC) and insufficiency of disclosure (Article 100(b) EPC).

The Opponents (Appellants 01 and 02) referred to the following prior art documents:

(1) Chemical Abstracts, Vol. 83, page 135, No. 133 772p relating to JP-A-75/59505 (translation into English submitted by Appellant 01)

(2) DE-A-1 929 738

(3) DE-A-2 262 906

(4) FR-A-1 525 519

(5) US-A-3 052 595

(6) "Der Einsatz von ALTONIT bei der Papiererzeugung", brochure Erbslöh & Co., 15 January 1977

(7) Das Papier, Vol. 27, 1973, pages 417-422, H. Pummer "Selektive Füllstoffretention und optische Eigenschaften des Papiers"

(8) Wochenblatt für Papierfabrikation, Vol. 107, 1979, pages 493-502, W. Auhorn et al. "Untersuchung von Störsubstanzen in geschlossenen Kreislaufsystemen" (Paper presented at the Symposium "Chemisch-technologische Probleme der Papierherstellung" 1978 in München) and

(9) Das Papier, Vol. 29, 1975, pages V32-V43, H.F. Arledter et al. "Synergistische Flockung stoffhaltiger Suspensionen der Papier- und Zellstoffindustrie".

The Proprietor of the patent (Respondent) introduced a number of documents published after the priority date of the patent in suit into the opposition proceedings. Amongst these documents the following one is of particular relevance:

(10) Pulp & Paper Canada, Vol. 81, 1980, pages 54-62, R.H. Pelton et al. "A survey of potential retention aids for newsprint manufacture".

III. By an interlocutory decision within the meaning of Article 106(3) EPC, notified on 25 October 1988, the Opposition Division decided to maintain the European patent in amended form as specified in a communication pursuant to Rule 58(4) EPC dated 3 February 1988.

IV. Appellant 01 and Appellant 02 each filed a Notice of Appeal against this decision on 17 December 1988 and 16 December 1988, respectively, and paid the appeal fees on 17 and 19 December 1988, respectively. The Statements of Grounds were filed on 17 December 1988 and 28 February 1989.

V. In a Communication dated 28 February 1991, the Board introduced the document

(11) Book "B" Preprints of papers to be presented to the 65th Annual Meeting of the Technical Section of the Canadian Pulp and Paper Association on 1 and 2 February 1979, pages B163 to B172, R.H. Pelton et al. "A survey of potential retention aids for newsprint manufacture"

into the proceedings as evidence that the content of document (10) was published before the priority date of the contested patent.

VI. Oral proceedings were held on 7 May 1991. In the course of these proceedings, after a discussion of the four sets of claims filed with the Respondent's letter of 11 April 1991, the Respondent presented a modified set of Claims 1 to 6 together with a correspondingly revised description.

Independent Claim 1 is worded as follows:

"A method in which newsprint or fluting medium is made from an aqueous suspension of cellulosic fibres that is substantially free of filler and that has been formed from a pulp having a cationic demand of at least 0.1% and in which the drainage and retention properties of the suspension are improved by including in the suspension a water soluble polymer and 0.02 to 2% (dry weight based on the dry weight of the suspension) of a bentonite type clay, wherein the polymer is a substantially non-ionic polyacrylamide polymer containing 1 to 10 mole% acrylic acid groups and having molecular weight above one million and the clay is added to the pulp and the polymer is subsequently added to the pulp containing the clay and the

newsprint or fluting medium contains less than 5% by weight total filler."

Dependent Claims 2 to 6 relate to preferred features of the method according to Claim 1.

VII. The arguments presented by the Appellants in their written submissions and at the oral proceedings, insofar as these are still relevant to the present claims, can be summarised as follows:

Appellant 01 maintained his objection under Article 100(b) EPC in conjunction with Article 84 EPC. In particular, he argued that the term "a pulp having a cationic demand of at least 0.1%" specified in Claim 1 was unclear and could not serve to delineate the claimed method over the prior art. The type and molecular weight of the cationic polymer required to determine the cationic demand of the pulp should be indicated.

As far as inventive step was concerned, Appellant 01 referred to documents (6), (11), (3), (8), (5) and (4). The use of bentonite in combination with polymers as means for increasing retention in the manufacture of paper was already known from documents (6), (3), (8) and (5). The latter document especially taught that bentonite and acrylamide polymer were mutually activating. Although this document was concerned with the manufacture of high quality, filled paper and filler retention, the person skilled in the art and faced with the problem of producing low grade unfilled paper like newsprint and fluting medium would take this prior art into consideration, particularly in view of the synergistic effect mentioned above. Furthermore, the subject-matter of Claim 1 was obvious having regard to documents (3) and (8), which disclosed that improvement in retention and drainage could be

achieved if bentonite was added to a suspension of low grade fibres containing cationic retention aids. In addition, document (4) gave a hint in the direction of Claim 1, since it suggested the use in newsprint manufacture of high molecular weight anionic polymers, for example polyacrylamide containing acrylic acid.

Appellant 02 argued that the subject-matter of Claim 1 lacked novelty in view of document (5). This document was not restricted to the manufacture of high quality paper and the presence of a large amount of filler. According to Claim 1 of this citation, it rather comprised all kinds of paper and low amounts of filler, e.g. low grade paper which inherently had a high cationic demand. Document (5) thus covered the claimed method.

In case the claimed method was considered to be novel over document (5), it would at least be obvious, in the light of document (11), to apply the teaching of document (5) to suspensions of low grade fibres. Furthermore, a combination of documents (3) and (11) would lead to the claimed method. Since it was known from document (11) that a high molecular weight nonionic polyoxyethylene was the most cost effective retention aid for newsprint manufacture, no inventive step could be seen in replacing the cationic polymer mentioned in document (3) by a substantially nonionic polymer.

VIII. In response, the Respondent argued that Claim 1 was clear and its subject-matter was novel and involved an inventive step. None of the citations suggested combinations of 0.02 to 2% bentonite and a substantially nonionic polyacrylamide polymer containing 1 to 10 mole% acrylic acid groups, which is already termed as a low anionic copolymer, and having molecular weight above one million for use on the pulps defined in Claim 1 to obtain the

surprising improvement in drainage and retention properties.

IX. The Appellants request that the decision under appeal be set aside and the patent be revoked in its entirety.

The Respondent requests that the patent be maintained on the basis of Claims 1 to 6 and description pages 2 to 6 and page 3a (to be inserted on page 2) as submitted at the oral proceedings.

X. At the conclusion of the oral proceedings, a decision of the Board was announced as hereinafter stated in the Order.

Reasons for the Decision

1. The appeal is admissible.

2. **Amendments**

The amended claims meet the requirements of Article 123(2) EPC. In particular, the features of Claim 1 concerning the filler content of less than 5%, the bentonite content of 0.02 to 2% and the type and molecular weight of polymer can be unequivocally deduced from pages 4 and 5 of the description as originally filed. The new range of 1 to 10 mole% acrylic acid groups is admissible in view of page 5, lines 17 to 22 of said description and the decision T 2/81, "Methylen-bis-(phenylisocyanat)" (OJ EPO 1982, 394, in particular point 3). The description has been amended solely by way of adaptation to the modified claims.

Furthermore, the features of Claim 1 represent a clear limitation of the scope of protection in comparison with the granted Claim 1. Thus, Claim 1 does not contravene Article 123(3) EPC, either.

3. Clarity

The Board is satisfied that, due to the introduction into Claim 1 of the feature concerning the total amount of filler being less than 5%, Claim 1 is clear as required by Article 84 EPC and that the invention is sufficiently clear and complete for it to be carried out by a person skilled in the art (Articles 83 and 100(b) EPC). This feature in combination with the features that newsprint or fluting medium is made from an aqueous suspension that has been formed from a pulp having a cationic demand of at least 0.1% clearly defines the suspension and pulp used and the product made in the claimed method. In the absence of any indication in Claim 1 of the type and molecular weight of the cationic polymer required to determine the cationic demand of the pulp used to form the suspension, the feature "pulp having a cationic demand of at least 0.1%" is to be interpreted as meaning that those types of pulp have to be used in the claimed method in which the amounts of cationic polymer required to be added to give any significant increase in fibre retention and drainage is at least 0.1% regardless of the type of polymer and that, thus, the amount of even the most effective cationic polymer that must be added is greater than 0.1% (cf. page 2, third paragraph of the Respondent's letter dated 14 March 1986).

4. Novelty

The method according to Claim 1 is novel over the prior art documents mentioned during the proceedings, since none of these documents discloses a method which comprises, in

combination, the features that newsprint or fluting medium containing less than 5% total filler is made from the particular suspension defined in Claim 1 and that 0.02 to 2% of a bentonite type clay and a water soluble, substantially nonionic polyacrylamide polymer containing 1 to 10 mole% acrylic acid groups and having molecular weight above one million are added in this sequence to the suspension.

This can clearly be seen from the fact that documents (2), (4), (7), (9) to (11) are not concerned with the use of bentonite and documents (3) and (8) mention the use of cationic polymers in combination with bentonite. Document (6) does not disclose the combination of bentonite and high molecular weight, low anionic polyacrylamide polymers. Document (1) is neither concerned with the manufacture of newsprint or fluting medium nor does it describe the sequence of adding the bentonite type clay to the pulp before adding the polymer to the pulp containing the clay.

As to document (5), the Board cannot share the view of Appellant 02 that Claim 1 lacks novelty in the light of this citation. It is true that Claim 1 of this document mentions in general terms the manufacture of paper. However, a realistic interpretation of the whole document, taking into consideration the mentioning of the filler content of 10 to 60% (cf. column 2, lines 45 to 55), clearly shows that this document is concerned with high quality, filled papers. At least it does not disclose newsprint or fluting medium containing less than 5% by weight total amount of filler, including added bentonite type clay, as claimed in the patent in suit. Even if document (5) was considered to comprise all kinds of paper and low amounts of filler, as alleged by Appellant 02, this would not mean that it would necessarily destroy

novelty of the claimed method, since a generic disclosure does not normally take the novelty of any specific example falling, as a proper selection invention, within the terms of that disclosure.

5. **Closest state of the art**

Document (11) represents the state of the art which is closest to the subject-matter of Claim 1. Indeed, this document is also concerned with the manufacture of newsprint, i.e. essentially unfilled paper, and describes retention aids which improve fibre fines retention and, thus, also the drainage properties (cf. page B163, right column, third paragraph) of an aqueous suspension of cellulosic fibres that was substantially free of filler and was formed from a pulp having a cationic demand of at least 0.1% (cf. Figures 1 to 3). A high molecular weight, nonionic polyoxyethylene was found to be the most cost effective retention aid. The next most effective retention aid was a high molecular weight, cationic polyacrylamide.

6. **Problem and solution**

Considering, as was accepted by the Respondent, document (11) as the starting point for the claimed method when assessing inventive step, the objective technical problem to be solved over the closest prior art can be formulated. It is to be seen in a further improvement of fibre retention and drainage properties of the suspension as defined in Claim 1 for the manufacture of newsprint or fluting medium.

The problem is solved in accordance with Claim 1 by using a combination of 0.02 to 2% of a bentonite type clay and a water soluble, substantially nonionic polyacrylamide

polymer containing 1 to 10 mole% acrylic acid groups, i.e. a low anionic copolymer, and having molecular weight above one million. The clay is first added to the pulp and thereafter the polymer is added to the pulp containing the clay.

In the light of the examples mentioned in the patent specification and of the technical reports filed during the proceedings, the Board is satisfied that the use of the above combination of bentonite type clay and the particular copolymer results in improved fibre retention and drainage properties.

7. Inventive step

7.1 The question to be considered is whether or not it was obvious to a person skilled in the art and faced with the problem indicated above to use a combination of bentonite and the low anionic acrylamide copolymer defined in Claim 1 as additives for improvement of fibre retention and dewatering in a method for newsprint and fluting medium manufacture.

7.2 The closest prior art document (11) itself cannot have given a hint in the direction of such a combination for two reasons. First, this document is completely silent as to the use of bentonite as additive. Second, the most effective retention aids mentioned in this document are nonionic polyoxyethylene and a particular cationic acrylamide copolymer, whereas anionic retention aids consisting of copolymers of acrylamide and acrylic acid are described as ineffective (cf. document (11), page B168, right column, fourth paragraph, Table II and Figure 4).

7.3 Most of the other prior art documents are concerned either with additives other than bentonite (cf. documents (2), (4), (7) and (9)) or with the use of bentonite in combination with cationic polymers (cf. documents (3) and (8)) and, therefore, cannot have suggested the use of a combination of bentonite and low anionic polymer of the type defined in Claim 1.

7.4 Document (6) shows that ALTONIT, a bentonite type clay, can be used to improve filler retention and fibre retention and that certain properties of newsprint can be improved by such an additive. It is stated in document (6) that best results can be obtained when ALTONIT is applied together with anionic retention aids having molecular weight in the range between low and high, but that all other usual retention aids can be used. Since, however, none of the prior art documents cited in the proceedings teaches the use of low anionic polymers consisting of copolymers of acrylamide and 1 to 10 mole% acrylic acid and having a high molecular weight of above one million as fibre retention aid for newsprint or fluting medium manufacture, the Board cannot consider it obvious to use this particular copolymer in combination with bentonite to solve the problem underlying the present invention, i.e. to improve fibre retention and dewatering.

It is true that, as pointed out by Appellant 01, document (4) (cf. Example 5 and page 2, right column, third paragraph) mentions the use of a high molecular weight copolymer of acrylamide and 10 mole% acrylic acid and also mentions low quality paper ("papier-journal"). However, this additive is described as preventing flocculation during paper making and, therefore, does not suggest that, in combination with bentonite, it can be useful in improving fibre retention and drainage properties. Whilst preventing flocculation may be

desirable in certain situations, in others the opposite is true (cf. document (9)). There was, therefore, no compelling reason to try such agents for other reasons.

7.5 Documents (1) and (5) are the only ones among those cited in the proceedings which are concerned with a combination of bentonite and high molecular weight acrylamide polymer that may contain a low amount of acrylic acid units, i.e. a copolymer that can be of the low anionic type defined in Claim 1 (cf. document (1), in particular page 5, last paragraph and document (5), paragraph bridging columns 1 and 2). However, the purpose of this copolymer is to improve peeling properties on driers (cf. document (1)) or to increase filler retention in filled paper (cf. document (5)). Documents (1) and (5) do not suggest that this copolymer could have the effect of improving fibre retention and dewatering. They would, therefore, not be considered by the person skilled in the art and faced with the totally different problem mentioned above. The assumption of one of the Appellants that, based on document (5), column 1, lines 32 to 36 and the turbidity readings in Example 3, increased filler retention would be accompanied by increased fibre retention, is not justified in view of the statements in column 1, lines 24 to 32, which clearly deal with filler retention.

7.6 The Appellants argued that it was obvious in the light of document (11) to apply the teaching of document (5) to suspensions of low grade fibres, in particular in view of the synergistic effect of bentonite and acrylamide polymer known from document (5). They did, however, not succeed in presenting convincing arguments why improvement of fibre retention and drainage could have been expected when applying the teaching of document (5), which deals with filler retention, to low grade fibres. Such an improvement could, rather, not be expected, since it was known from

document (11) that anionic polymers and nonionic polymers, with the exception of polyoxyethylene, were ineffective as fibre fines retention aids (cf. page B168, right column, fourth paragraph and the paragraph bridging pages B168 and B169).

Furthermore, the Appellants' arguments that a combination of documents (3) and (8) or (3) and (11) would lead to the claimed method cannot be accepted. Document (3) (cf. page 6, original numbering) and document (8) (cf. paragraph 7.3) both relate to the same problem as the patent in suit. The term "Trübung" (turbidity) used in document (3) should be interpreted as transparency, since distilled water was mentioned as having the reading of 100 (cf. page 7, original numbering, third paragraph). Document (3) as well as document (8) are concerned with low grade fibres and disclose the use of a combination of bentonite and polymer. The polymer, however, is cationic and there is no suggestion that the cationic polymer should be replaced by an entirely different polymer, namely a low anionic copolymer as defined in the invention. As already mentioned above, document (11) teaches that anionic polymers and nonionic polymers, except polyoxyethylene, are ineffective as fines retention aid and, therefore, would lead away from the claimed method.

7.7 Summing up, the Board comes to the conclusion that the subject-matter of present Claim 1 cannot be derived in an obvious manner from the cited prior art and, accordingly, involves an inventive step having regard to Article 56 EPC.

8. The method according to Claim 1 is, therefore, patentable (Article 52(1) EPC) and the patent may be maintained on the basis of this Claim 1 and dependent Claims 2 to 6.

Order

For these reasons, it is decided that:

1. **The decision under appeal is set aside.**

2. **The case is remitted to the first instance with the order to maintain the patent on the basis of the documents specified in paragraph IX above.**

The Registrar: **The Chairman:**

N. Maslin

G. Szabo

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