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**Datasheet for the decision
of 4 April 2012**

Case Number: T 0062/10 - 3.3.06
Application Number: 01987827.1
Publication Number: 1328683
IPC: D21H 21/10, D21H 17/68
Language of the proceedings: EN

Title of invention:
Manufacture of paper and paperboard

Patentee:
Ciba Speciality Chemicals Water Treatments Limited

Opponent:
SNF S.A.S.

Headword:
Papermaking/CIBA

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step (no): main request, first, second and fourth
auxiliary requests"
"Amendments (not allowable): third auxiliary request"

Decisions cited:
-

Catchword:
-



Case Number: T 0062/10 - 3.3.06

D E C I S I O N
of the Technical Board of Appeal 3.3.06
of 4 April 2012

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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
26 November 2009 concerning maintenance of
European patent No. 1328683 in amended form.

Composition of the Board:

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

Summary of Facts and Submissions

I. This appeal is from the interlocutory decision of the Opposition Division concerning maintenance of European patent No. 1 328 683 in amended form on the basis of the then pending main request. The independent Claim 1 reads:

"1. A process for making paper or paper board comprising forming a cellulosic suspension, flocculating the suspension, draining the suspension on a screen to form a sheet and then drying the sheet, characterised in that the suspension is flocculated using a flocculating system comprising a siliceous material and organic microparticles which have an unswollen particle diameter of less than 750 nanometers, wherein a further flocculating material is included into the cellulosic suspension before adding the polymeric microparticles and siliceous material, and in which the flocculating material is cationic and is a natural or synthetic polymer, in which the microparticles are made from anionic copolymers comprising from 0 to 99 parts, by weight, of nonionic monomer and from 100 to 1 part by weight of anionic monomer, based on the total weight of anionic and nonionic monomers, in which the suspension is first flocculated by introducing the cationic polymer, subjecting the suspension to mechanical shear and then reflocculating the suspension by introducing the polymeric microparticle and siliceous material."

II. A notice of opposition had been filed against the granted patent, wherein the Opponent sought revocation of the patent inter alia on the grounds of Article 100(a) EPC for lack of inventive step (Articles 52(1) and 56 EPC). The opposition was based, amongst others, on the following documents

D1 EP-A-0 462 365,

D2 EP-A-0 877 120 and

D3 Declaration by Paul Cutts, dated 8 September 2009.

III. In its decision, the Opposition Division held that a skilled person would not have had any motivation to modify the process disclosed in document D1 so as to use the microparticles in combination with silica since he would expect worse drainage. Nor had he any reason to use the cross-linked microparticles of document D1 in the process disclosed in document D2. Moreover, neither document D1 nor document D2 disclosed the feature of reflocculation.

IV. This decision was appealed by the Opponent, now Appellant.

V. The Proprietor, now Respondent, maintained the main request and filed amended sets of claims in 3 auxiliary requests under cover of a letter dated 1 November 2010 and in a fourth auxiliary request during oral proceedings held before the Board on 4 April 2012.

Claim 1 of the first auxiliary requests differs from that of the main request by adding at the end of the

claim the feature ", in which the microparticles are microbeads which have a particle size of less than 750 nanometers and are cross-linked". Claim 1 of the second auxiliary request differs from that of the first auxiliary request by introducing the feature "in which the cationic polymer is formed from a water soluble ethylenically unsaturated monomer or water soluble blend of ethylenically unsaturated monomers comprising at least one cationic monomer," between the terms "microparticle and siliceous material" and "in which the microparticles are microbeads". Claim 1 of the third auxiliary request differs from that of the second auxiliary request by adding at the end of the claim the features ", in which the cellulosic suspension comprises filler, wherein either i) the siliceous material is silica microgels or ii) the amount of polymeric microparticles is up to 400 ppm by weight based on the weight of dried suspension, and the dose of siliceous material is at least 500 ppm by weight". Claim 1 of the fourth auxiliary request differs from that of the third auxiliary request by deleting the term "either i) the siliceous material is silica microgels or ii)", by replacing the term "up to 400 ppm" by "50 to 400 ppm" and by replacing the term "at least 500 ppm" by "500 to 2000 ppm".

VI. The Appellant submitted in essence the following arguments:

The subject-matter claimed in the main request was not inventive in view of Example 27 of document D2 as the closest prior art or in view of Example 35 of document D1. Concerning document D1, it was explained that a skilled person did not expect a decrease in drainage

and retention if part of the microparticles were replaced by bentonite as suggested in the description of document D1.

This applied also to the auxiliary requests since their features were either known from document D1 or did not provide any particular effect.

Concerning Claim 1 of the third and fourth auxiliary requests, the Appellant objected under Article 123(2) EPC to the introduction of the feature concerning the amounts of microparticles and siliceous material.

VII. The Respondent submitted in essence the following arguments:

Document D2 was not the closest prior art since it did not have the most features in common with the claimed invention. Document D1 was more suitable as a starting point for assessing inventive step since it differed from the claimed process only in that it did not disclose the addition of cationic polymer, followed by a degradation of agglomerates by applying shear and then adding bentonite and microparticles in combination. Starting from Example 35 of document D1 and considering the results shown in Example 31, a skilled person had not incentive to replace part of the microparticles by bentonite in order to improve drainage and retention.

Therefore, the subject-matter claimed in the main request was not obvious in the light of the cited prior art.

This applied the more so to the subject-matter claimed in the first to third auxiliary requests where the additional features concerned preferred selections.

Concerning the fourth auxiliary request, the Respondent argued that it had been shown in the tests contained in document D3 that unexpected improvements were achieved in comparison with the process disclosed in documents D1 and D2.

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

The Respondent requested that the appeal be dismissed or that the patent be maintained on the basis of one of the auxiliary requests 1 to 3 filed with the letter dated 1 November 2010 or the fourth auxiliary request filed during oral proceedings.

Reasons for the Decision

1.1 The patent in suit relates to the field of papermaking, in particular to a process of papermaking by forming a cellulosic suspension, flocculating the suspension by using a flocculating system, draining the suspension on a screen to form a sheet and then drying the sheet (paragraph 1 and 2 and Claim 1).

It is acknowledged in the patent in suit that such processes are known in the art, inter alia from document D1 where ionic, organic microparticles of less than 750 nm in diameter are disclosed as retention additives (paragraph 10).

The independent Claim 1 of any of the Respondent's requests, specifically pertain to a method of papermaking by first flocculating the suspension by introducing a cationic polymer, then subjecting the suspension to mechanical shear and then reflocculating the suspension by introducing a second flocculating material.

According to the patent in suit, known processes of this kind use bentonite (paragraphs 4 and 6), anionic polymer (paragraph 8) or colloidal silica and charged acrylamide copolymer (paragraph 9) as the second flocculating material.

The technical problem underlying the invention is stated to consist in complying with the still existing need for further improving drainage, retention and formation in the papermaking processes and the need for providing a more effective flocculating system for making highly filled paper (paragraph 13).

- 1.2 As mentioned above, the relevant prior art cited in the patent in suit includes document D1 which is considered by the Respondent as the closest prior art for the assessment of inventive step. In his opinion, document D1 had the most features in common with the claimed subject-matter.
- 1.3 The Board agrees that documents D1 is a suitable starting point for the assessment of inventive step since it relates to the same technical problem as the patent in suit, namely the improvement of drainage and

retention of a papermaking process (document D1 page 2, lines 3 to 4 and page 3, lines 23 to 25).

- 1.4 For that purpose, document D1 discloses a papermaking process which comprises the embodiment of adding to the suspension a crosslinked ionic organic polymer microbead of less than 750 nm in diameter and, additionally, a high molecular weight, hydrophilic ionic organic polymer and/or an ionic polysaccharide, such as starch, preferably of a charge opposite that of the microbead (page 3, lines 23 to 31). In the detailed description, document D1 goes on saying that if the high molecular weight polymer or polysaccharide is cationic, the preferred sequence of addition is adding the cationic polymer first, then the anionic microbead. There is an explicit teaching that the inverse order of addition is not preferred (page 4, lines 18 to 23).

Other embodiments of document D1 are processes wherein the microbeads are either anionic or cationic and added alone, cationic microbeads are used in conjunction with anionic high molecular weight polymers or the microbeads are used in combination with high molecular weight polymers of similar charge (page 3, line 57 to page 4, line 3, page 4, lines 36 to 41).

Further, it is said that the microbeads may be replaced up to 50 % by weight with bentonite or silica (page 7, lines 16 to 18).

- 1.5 The Respondent argued that none of the examples of document D1 implied a process employing cationic polymer and then a flocculating system involving both anionic microparticles and siliceous material. On the

contrary, considering these examples, a skilled person had no motivation to employ such a system since it was evident from Example 31 of document D1 that anionic microbeads give better drainage than 3 times the amount of silica. The statement on page 7 of the description of document D1 did not suggest that replacing in Example 35 of document D1 part of the microbeads with silica might be beneficial for drainage and retention. Hence, a skilled person would not consider combining a cationic polymer in combination with a flocculating system containing anionic microparticles together with a siliceous material in order to improve drainage and retention.

- 1.6 The Board is not convinced by this argument, since the disclosure of a document is not confined to the detailed information given in the examples but includes any reproducible technical information in the whole document made available to the skilled reader (Case Law of the Boards of Appeal of the European Patent Office, 6th edition 2010, chapter I.C.2.7).

Hence, it is irrelevant for the question of what is disclosed in document D1 whether an example is directed towards an embodiment wherein cationic polymer is used in combination with a flocculating system comprising anionic microparticles and siliceous material if such an embodiment arises unambiguously from other parts of that document.

Moreover, determining the disclosure of a document is not a matter of assessing what a skilled person would have done in order to improve that prior art. Therefore, it is irrelevant for the question of what has been

disclosed in document D1 that the examples in the patent in suit, under certain circumstances, show an improvement in drainage and retention if part of the organic microparticles is replaced by bentonite.

On the other hand, the statement on page 7, lines 14 to 18 concerning what is part of the invention of document D1 is quite clear, namely that it is preferred that the high molecular weight, ionic polymer and/or polysaccharide and the microbeads are of a charge opposite to each other and that the microbeads may be used as such or may be replaced in part, i.e. up to 50 % by weight, with bentonite or silica such as colloidal silica.

In the Board's opinion, this means that document D1 is intended to cover embodiments where the microbeads may be replaced in part by bentonite or silica even in those embodiments of document D1 where ionic polymers or polysaccharides are used in conjunction with the microbeads.

While being true that Example 31 of document D1 indeed shows that addition of 3 pounds/ton of silica with an average size of 5 nm gives still worse drainage times than addition of 1 pound/ton of a particular cross-linked anionic microbead of specific ionicity and 130 nm in diameter, this does not mean that a skilled person would, therefore, ignore completely the teaching on page 7 of document D1 or conclude that silica should not be used specifically in all those cases where cationic polymer is added first, followed by the anionic microbeads. This is corroborated by the fact

that Example 35 shows that drainage times improve as the amount of silica increases.

The Board concludes, therefore, that document D1 does not provide a prejudice against such replacement in certain embodiments disclosed therein, in particular in the preferred embodiment where cationic polymer and/or starch is added first, followed by addition of the anionic microbead.

- 1.7 Hence, document D1 is held to disclose a papermaking process wherein a cationic, natural or synthetic polymer is added to the cellulosic suspension, followed by the addition of flocculating system comprising the anionic microparticles and siliceous material.

2. *Main request*

- 2.1 Document D1 does not explicitly disclose in the general portion of the description to apply shear on the suspension after adding the cationic polymers and to reflocculate thereafter the suspension by adding the anionic microbeads.

The Board notes that reflocculation means that flocs formed in the suspension due to the addition of a first flocculating material are mechanically degraded by the application of shear whereupon the suspension is again flocculated by adding further flocculating material (see also paragraphs 8, 57 and 58 of the patent).

- 2.2 There is nothing on file showing what effect might be achieved by this particular *modus operandi* in

comparison with e.g. a practise where the initially produced flocs are not degraded.

Hence, the technical problem credibly solved by the claimed process over the disclosure of document D1 has to be reformulated as providing a further method of making paper by forming a cellulosic suspension, flocculating and draining the suspension to form a sheet and drying the sheet.

- 2.3 It remains to be decided whether it was obvious for someone skilled in the art to modify the method disclosed in document D1 by subjecting the suspension to shear after a first flocculation by the cationic polymers and reflocculating the suspension by adding the polymeric microparticles and the siliceous material, in order to solve the above technical problem.
- 2.4 Papermaking processes displaying enhanced drainage and retention by applying shear to mechanically degrade the flocs formed in a cellulosic suspension by the addition of a cationic polymer and then reflocculating the suspension by applying a second retention aid are known in the art as indicated in that part of the description of the patent in suit which relates to the relevant prior art (in particular paragraphs 4 and 8).

This is corroborated by document D1, since in the examples shear is also applied upon addition of the ionic polymer and the microbeads (page 7, lines 47 to 48) and Example 28 specifically shows the effect of different shear conditions on the relative performance of a retention aid. It is further corroborated by the preference in document D2 to apply shear after the

addition of an ionic water-soluble polymer and also after the addition of a second, anionic, polymer, however with the restriction in the latter case not to mix excessively in order to prevent destruction of the formed agglomerates (page 8, lines 20 to 23).

Therefore, it is obvious for a skilled person wishing to operate the process of document D1 to apply shear after the addition of the cationic polymers such as to degrade the flocs formed by the addition, thus bringing about reflocculation upon addition of the second flocculating agent.

- 2.5 Consequently, the Board concludes that the skilled person, faced with the above mentioned technical problem of providing a further method of papermaking, would have arrived at the subject-matter of Claim 1 by following the teaching of the prior art.

Therefore, the subject-matter of Claim 1 of the main request does not amount to an inventive step.

3. *First auxiliary request*

- 3.1 Claim 1 of the first auxiliary request differs from Claim 1 of the main request insofar as the microparticles to be used are cross-linked.

- 3.2 As correctly pointed out by the Appellant and unchallenged by the Respondent, document D1 already discloses this feature as of importance.

- 3.3 The Board concludes therefore that an inventive step cannot be based on that particular feature with the

consequence that the subject-matter of Claim 1 of the first auxiliary requests is not based on an inventive step.

4. *Second auxiliary request*

4.1 Claim 1 of the second auxiliary request differs from that of the first auxiliary request by specifying that cationic polymer is formed from a water soluble ethylenically unsaturated monomer or water soluble blend of ethylenically unsaturated monomers comprising at least one cationic monomer.

4.2 According to the Respondent, the effect achieved by this feature consisted in a particular selection of the cationic polymer.

However, such cationic polymers are also disclosed in document D1 and preferred in the examples (see paragraph bridging pages 6 and 7 in combination with page 5, lines 28 to 38 and page 8, lines 1 to 11).

4.3 Consequently, the subject-matter of Claim 1 of the second auxiliary requests is not based on an inventive step.

5. *Third auxiliary request*

5.1 Claim 1 of the third auxiliary request contains the feature "ii) the amount of polymeric microparticles is up to 400 ppm by weight based on the weight of dried suspension, and the dose of siliceous material is at least 500 ppm by weight".

5.2 In the Respondent's opinion, this feature is based on the paragraph bridging pages 16 and 17 of the application as originally filed (see also paragraph 56 of the patent as granted).

However, according to this paragraph, the amount of polymeric particles is defined not only by an upper limit of 400 ppm but also by a lower limit of 20 ppm, preferably 50 ppm. Likewise, the amount of siliceous material is defined not only by a lower limit which is preferably 500 ppm, but also by an upper limit of 10.000 ppm, preferably 2000 ppm.

Hence, when defining the claimed subject-matter by amounts to be used, the omission of the lower limit for the amount of polymeric microparticles and of the upper limit for the amount of siliceous material violates the requirements of Article 123(2) EPC.

5.3 Claim 1 of the third auxiliary request is, therefore, not allowable under Article 123(2) EPC.

6. *Fourth auxiliary request*

6.1 Claim 1 of the fourth auxiliary request differs from that of the second auxiliary request by the following additional features:

i) the cellulosic suspension comprises filler,

and

ii) the amount of polymeric microparticles is 50 to 400 ppm by weight based on the weight of the dried

suspension, and the dose of siliceous material is 500 to 2000 ppm by weight.

- 6.2 The Board notes that both features are allowable under Article 123(2) EPC, but not based on an inventive step for the following reasons:
- 6.3 Concerning feature i), reference is made to documents D1 (page 4, lines 6 to 11) and D2 (page 10, line 4) which both suggest the addition of filler in the suspension.
- 6.4 Concerning feature ii), the Respondent relied on the experiments of document D3. In his opinion, these experiments showed that the claimed excess of siliceous material over polymeric microparticles provided and unexpected improvement of drainage and retention.
- 6.5 The Board agrees insofar as document D3 indeed shows that drainage and retention improve as the proportion of bentonite increases and that the best results are obtained if bentonite is present in excess. However, these results are not reflected in the examples shown in the patent in suit and also in contradiction thereto, since in the patent in suit the best results are obtained if the ratio of micro-particles to bentonite is 500 ppm : 500 ppm or 1 : 1 (see paragraphs 82, 88, 93 and 100 of the patent).

This corresponds exactly to the reference in document D1 to replace the microparticles up to 50 % by weight with bentonite.

No inventive step can be based on the feature requiring going beyond that limit if no specific effect is achieved.

The Board further observes that the experiments of document D3 differ from the examples in the patent in suit at least with respect to the consistency of the pulp, the amount of filler in the pulp and the composition of both, the cationic polymer and the polymeric microparticle. Hence, it is not possible to simply explain the results obtained in the patent as well as in document D3 by the ratio bentonite : microparticle alone, if other features exist which might have an influence too.

- 6.6 Therefore, the above conclusions with respect to Claim 1 of the higher ranking requests apply also to Claim 1 of the fourth auxiliary request.

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

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:

D. Magliano

P.-P Bracke