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**Datasheet for the decision
of 11 February 2020**

Case Number: T 2114/16 - 3.3.06

Application Number: 10719950.7

Publication Number: 2425057

IPC: D21H17/67, D21H11/18

Language of the proceedings: EN

Title of invention:

METHOD FOR PRODUCING FURNISH, FURNISH AND PAPER

Patent Proprietor:

UPM-Kymmene Corporation

Opponents:

- 1) --- (the opposition of Billerud Korsnäs AB was withdrawn)
- 2) Aechter, Bernd
- 3) Stora Enso Oyj
- 4) Holmen AB
- 5) Imerys Minerals Limited

Headword:

Paper Furnish/UPM-Kymmene Corporation

Relevant legal provisions:

EPC Art. 54, 56, 83, 123(2)
RPBA Art. 12(4)

Keyword:

Late-filed evidence - admitted (no)
Sufficiency of disclosure - (yes) - main request
Amendments - allowable (yes) - main request
Novelty - (yes) - main request
Inventive step - (yes) - main request

Decisions cited:

G 0001/03, T 1797/09, T 1307/12

Catchword:



Beschwerdekammern
Boards of Appeal
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Case Number: T 2114/16 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 11 February 2020

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
5 August 2016 concerning maintenance of the
European Patent No. 2425057 in amended form.**

Composition of the Board:

Chairman G. Santavicca
Members: S. Arrojo
J. Hoppe

Summary of Facts and Submissions

I. The appeals of opponents 3, 4 and 5 lie against the decision of the opposition division to maintain European patent Nr. 2 425 057 in amended form on the basis of the first auxiliary request filed during the oral proceedings held on 13 June 2016.

II. Claim 1 of the request upheld by the opposition division (respondent's main request) reads as follows:

"A method for preparing aqueous furnish to be used in paper or paper board manufacturing, in which method the furnish is prepared by adding at least filler to a fibre suspension, wherein the filler and/or the fibres are treated with cationic polyelectrolyte and nanofibrillated cellulose, characterized in that the filler and the fibres are treated first with cationic polyelectrolyte and secondly with nanofibrillated cellulose by adding them to the fibre-filler suspension."

Claims 2 to 6 concern preferred embodiments of the method according to claim 1.

Claim 7 concerns a method of manufacturing paper or paper board by preparing a furnish by the method according to claims 1 to 6, and preparing paper or paper board from the furnish.

III. Five oppositions had been filed against the patent on the grounds of lack of novelty and inventive step (Article 100(a) EPC), insufficiency of the disclosure of the invention (Article 100(b) EPC) and extension

beyond the content of the application as originally filed (Article 100(c) EPC).

With letter of 24 February 2015, opponent 1 withdrew its opposition, thus ceasing to be a party to the opposition proceedings.

The following items of evidence were *inter alia* relied upon during opposition proceedings:

- E9: S. Ahola et al., "*Cellulose nanofibrils - adsorption with poly(amideamine) epichlorohydrin studied by QCM-D and application as paper strength agent*", in Cellulose (2008) (published online already on 20 September 2007), 15:303-314, Springer Science+Business Media B.V., 2007;
- E22: English translation of JP 63-203894, published on 23 August 1988;
- E26: Miskiel, F.J. et al., "*Use of amylose corn starch to improve the paper strength attained by addition of microfibrillated cellulose*", in Research Disclosure 42806, December 1999;
- E32: Petri Silenius, "*Improving the combinations of critical properties and process parameters of printing and writing papers and paperboards by new paper-filling methods*", Dissertation Espoo, 2002.

IV. Initially, opponents 2, 3, 4 and 5 (from now on, respectively, "appellant 1", "appellant 2", "appellant 3" and "appellant 4") lodged an appeal and requested to set aside the decision under appeal and to revoke the opposed patent in its entirety.

V. With its statement setting out the grounds of appeal, appellant 4 filed three further documents:

Im1: M.C. Lofton et al., "*Deposition of polyelectrolyte complexes as a mechanism for developing paper dry strength*", in Tappi Journal, Vol.4, No.9, September 2005;

Im 2 and Im 3, which were no longer relied upon at the oral proceedings (*infra*), however.

VI. With its reply to the appeals, the patent proprietor (from now on "the respondent") requested the rejection of the appeals as its main request, or, alternatively, the maintenance of the patent on the basis of one of auxiliary requests 2-4 submitted with this reply.

VII. In a communication in preparation for oral proceedings, dated 24 April 2019, the Board gave its preliminary opinion, *inter alia* that

- documents Im1, Im2 and Im3 should not be admitted into the proceedings,
- the claimed invention was sufficiently disclosed and supported by the content of the application as originally filed,

as well as that

- the claimed subject-matter was novel and not obvious over the cited prior art.

VIII. With letter dated 10 September 2019, appellant 1 withdrew its appeal, and thus became party as of right pursuant to Article 107 EPC, second sentence.

IX. In response to the communication of the Board, appellant 3, with letter dated 23 December 2019, *inter*

alia submitted additional arguments in support of its objections under Article 56 EPC against the subject-matter of all claim requests.

- X. With letter dated 20 January 2020, opponent 3/appellant 2 announced that it would not attend the oral proceedings.
- XI. Oral proceedings took place on 11 February 2020 as scheduled, in the presence of the respondent as well as of appellants 3 and 4 (opponents 4 and 5).
- XII. The final requests of the parties at the oral proceedings were as follows:

The **appellants** (opponents 4 and 5) requested that the decision under appeal be set aside and that the European patent be revoked.

The same had been requested by the further appellant - opponent 3 - in writing.

The **respondent** (patent proprietor) requested

- that the appeals be dismissed (main request = former auxiliary request 1),
- or, as an auxiliary measure,
- that the patent be maintained in amended form based on one of auxiliary requests 2 to 4 filed with the reply to the statement setting out the grounds of appeal.

Reasons for the Decision

1. Procedural aspects
 - 1.1 Admittance of late filed document Im1
 - 1.1.1 Document Im1 was submitted for the first time with the statement setting out the grounds of appeal of appellant 4 (opponent 5).
 - 1.1.2 At the oral proceedings before the Board, appellant 4 sought to justify the late filing of Im1 in the appeal proceedings with the arguments that:
 - it was a reaction to the position taken in the decision under appeal (grounds, 8.4, were referred to) that there would be a prejudice to add a cationic polymer and a nanofibrillated cellulose to a fibre-filler suspension; moreover that,
 - Im1 had not been filed to present a new case/raise new objections, but simply to complement the lack of inventive step objection raised in view of document E9.
 - 1.1.3 These justificative arguments did not convince the Board for the following reasons:
 - In its response to the notices of opposition, dated 1 December 2014 (see pages 12 to 14), the patent proprietor (now respondent) had argued that there was no teaching in the cited prior art which would have motivated the skilled person towards the addition of a cationic polymer and nanofibrillated cellulose to a filler-fibre mixture.
 - Thus, the position taken in ground 8.4 of the decision under appeal had indeed already been invoked at the beginning of the opposition proceedings;

- this implied that opponent 5 (now appellant 4) had had sufficient time to react and to submit document Iml during the first instance proceedings.
- Consequently, Iml could and should have been submitted already in the opposition proceedings.
- Furthermore, appellant 4 has cited Iml both as stand-alone document and in combination with E9 to raise new objections under Article 56 EPC (see pages 7-8 of the statement setting out the grounds of appeal of appellant 4).

- 1.1.4 Therefore, the Board exercised its discretion under Article 12(4) RPBA-2007, Article 25 (2) RPBA 2020, and decided not to admit late filed document Iml into the appeal proceedings.
- 1.2 Admittance of the allegedly amended case of appellant 3 based on common general knowledge and document E32
 - 1.2.1 At the beginning of the oral proceedings before the Board, when presenting its initial requests, the respondent *inter alia* requested not to admit the late filed arguments of appellant 3 (opponent 4) on alleged common general knowledge submitted with letter of 23 December 2019 (see e.g. page 1).
 - 1.2.2 The arguments contained in the submission of 23 December 2019 deal with the role of a filler in papermaking, and in particular indicate that:
 - (1) it was generally known in papermaking that fillers were used as a substitute for fibre in the paper products production, as also confirmed by the opposed patent ([0002] lines 11-12); and that
 - (2) fillers used in papermaking to substitute fibres in the furnish, as also confirmed by the opposed patent ([0002]), were not merely an additive, but were used as

the main part of the paper, and thus could not be compared with other additives. This was also apparent for example from claim 2 at issue, where the filler content was claimed as being possibly 60 wt. %, i.e. as constituting a major part of the paper product itself.

(3) in order to prepare a furnish using less fibres, filler was used as a substitute of the fibres. Thus, filler was not added to impart any positive properties to the paper but to lower the costs

and, more particularly that,

(4) it was, in any case straightforward for the skilled person to add filler and mix it with the fibres.

1.2.3 The Board notes that, as apparent from the assessment of obviousness (see *infra*), in the present case, taking into account these arguments would not change the outcome of the proceedings.

1.2.4 It is also noted that it is equally irrelevant for the outcome of the proceedings whether document E32 is taken into account or not, because the objections based on this document are very generic, do not refer to specific passages thereof, and merely repeat what was considered to be well known in the art (also according to the contested patent), namely that it is generally known to add a filler to the fibre slurry as a substitute of part of those fibres in order to reduce costs and to control e.g. the opacity.

2. Main request - Article 83 EPC

2.1 The Board has come to the conclusion that the main request complies with the requirements of Article 83 EPC.

2.2 Appellant 3 argued that the invention could not be carried out throughout its entire scope, because claim 1 did not specify the type and amount of filler and of cationic polymer required to manufacture the paper furnish. The skilled person would therefore be confronted with an undue burden when trying to reproduce aqueous furnishes for any of the conditions encompassed by the subject-matter of claim 1.

Furthermore, the patent in suit provided a single example falling within the scope of the claim (i.e. example 2, strategy 4 and figure 7d) and unclearly referred to different nanofibrillated cellulose concentrations in different parts of the description (i.e. 15 and 30 mg/g of fibres in paragraph [0057] vs. 15% and 30% in paragraph [0059] referring to figures 8a) and 8b)). In view of this insufficient and inconsistent information, the skilled person would not be capable of reproducing the effects of the invention as described in paragraph [0061] of the patent in suit.

2.3 The Board considers that the determination of the types and amounts of filler and cationic polymer pertains to the common general knowledge of the skilled person, because both substances are commonly used in the papermaking industry. Moreover, it has not been shown that the information disclosed in e.g. paragraphs [0019] to [0024] of the patent in suit is insufficient to carry out the invention once common general knowledge is taken into account.

Furthermore, since the claims at issue do not define the technical effect described in paragraph [0061] of the patent in suit, the Board considers, in line with G 1/03 (OJ 2004, 413, reasons, 2.5.2, last paragraph, second sentence "If an effect is expressed in a claim,

there is lack of sufficient disclosure. Otherwise, i.e. if the effect is not expressed in a claim but is part of the problem to be solved, there is a problem of inventive step (T 939/92, OJ EPO 1996, 309)", that an objection based on the non achievement of the invoked effect cannot succeed, because the technical effect is not part of the invention.

2.4 The Board therefore maintains its provisional opinion and concludes that the subject-matter of claim 1 according to the main request is sufficiently disclosed in the patent in suit.

3. Main request - Article 123(2) EPC

3.1 The Board has concluded that the main request complies with the requirement of Article 123(2) EPC.

3.2 Appellant 2 argued that, since claims 3-6 as originally filed were dependent on claim 1, the characterising portion of original claim 1 must have necessarily encompassed all the alternatives defined in original claims 2-6. Consequently, since claim 1 of the main request was based on a combination of the characterising portions of original claims 1 and 2, it must necessarily encompass methods combining the subject-matters of original claims 3 to 6 with that of original claim 2. However, since the original application did not support the combination of the methods of claims 2, 3 and/or 4, the subject-matter of claim 1 of the main request included embodiments going beyond the content of the application as filed.

3.3 This objection is not convincing for the following reasons:

- Original claims 3-6 did not depend on claim 2, so the alternatives defined in those claims were different (and independent) from that defined in original claim 2.

- In the course of the examination proceedings claims 3-6 were deleted and claim 1 was restricted to the preferred form of claim 2 as originally filed, which, contrary to the arguments of appellant 2, implies that the subject-matter of claim 1 clearly excludes the alternatives originally defined in claims 3-6.

3.4 The subject-matter of claim 1 is therefore considered to be supported by the combination of claims 1 and 2 as originally filed.

3.5 The Board thus maintains its preliminary opinion and concludes that the main request does not extend beyond the content of the application as originally filed.

4. Main request - Article 54 EPC

4.1 The Board has come to the conclusion that the main request fulfills the requirements of Article 54 EPC.

4.2 In their statements setting out the grounds of appeal, opponents 2 and 3 (now, respectively, party as of right and appellant 2) maintained their objections of lack of novelty in view of E5 and E22.

In particular, appellant 1 argued that the method defined in claim 1 was anticipated by example 5 of E5.

This objection was based on the following assumptions:

- that the term "oxidized starch" in the invoked example implied that the starch was, at least to a certain extent, in the form of a fibre,
- that the mention of the substance "SB latex" (styrene butadiene latex) implied a polymer with at least some "cationic latices" (as well as anionic and non-ionic ones), and
- that the invoked example implied a sequential order of addition as defined in claim 1 at issue, because the claimed method did not require that the fibres and the fillers were mixed before adding the cationic polyelectrolyte.

4.3 The Board does not follow this argumentation for the following reasons:

As already made clear in the provisional opinion:

- The alleged fact that "oxidized starch can be in the form of fibres" (page 6, 2nd paragraph of grounds of opposition of appellant 1) is speculative, and can thus not be regarded as a clear and unambiguous disclosure.
- The "SB latex" mentioned in example 5 of E5 is not a clear and unambiguous disclosure of a "*cationic polyelectrolyte*" as defined in claim 1 at issue.
- Claim 1 at issue clearly requires that "*the filler and the fibres are treated first with cationic polyelectrolyte (...) by adding them to the fibre-filler suspension*", implying the formation of a fibre-filler suspension before the sequential addition of cationic polyelectrolyte and nanofibrillated cellulose.

Thus, example 5 of of E5 cannot be novelty destroying.

4.4 Appellant 2 had also objected that the method of claim 1 was not novel in view of the disclosure in comparative example 1 of E22, because reading claim 1

in the light of paragraph [0011] of the patent in suit would lead to the conclusion that the addition of the filler together with the CP was encompassed by the method of claim 1.

- 4.5 The Board does not share this objection, because there is no need to construe the subject-matter of claim 1 in view of the cited paragraph. In particular, in claim 1 at issue the defined step of "*adding them* [the CP and the NFC] *to the fibre-filler suspension*" clearly excludes the addition of the filler together with the CP. Hence, there is no reason to construe claim 1 in the light of the description, i.e. to deviate from the unambiguous meaning given therein.

Hence, document E22 cannot be novelty destroying either.

- 4.6 The subject-matter of claim 1 is therefore novel over the method illustrated in example 5 of E5 or in comparative example 1 of E22.

5. Main request - Article 56 EPC

- 5.1 The Board has concluded that the main request complies with the requirements of Article 56 EPC.

5.2 The invention

- 5.2.1 The present invention relates to a method for preparing aqueous furnish to be used in paper or paper board manufacturing (paragraph [0001]), as well as to the manufacture of paper or paper board from a furnish prepared by the method according to the invention.

- 5.2.2 According to the patent (paragraph [0006]), the invention addresses the need for a method that makes it possible to use a high content of the filler so that the strength of the final paper product will not decrease and so that the method will not cause any other unwanted effects on the manufacturing process.
- 5.2.3 In particular, still according to the patent (paragraph [0007]), the invention aims to provide a novel method for preparing aqueous furnish to be used in paper and paper board manufacturing in such a way that the paper product manufactured from the furnish has a high loading of filler, with good mechanical strength. The aim of the invention is also to provide a novel method for preparing a furnish in order to improve the interactions between fibres and fillers. More particularly (paragraph [0010], first sentence) the invention proposes to modify the fibre and/or filler surfaces in such a way that the fibre-filler bonding is enhanced (fillers and fibres generally form weak bonds, which causes low retention of fillers and poor mechanical properties).
- 5.2.4 According to the patent in suit (paragraph [0008]), these objectives are achieved by a method for preparing an aqueous furnish as defined in claim 1 at issue, including a particular sequential order of addition of components, as defined in the characterising portion thereof, which is the following:
1. preparation of a fibre suspension;
 2. addition of a filler to a fibre suspension;
 3. addition of a cationic polyelectrolyte (from now on "CP") to the fibres-filler mixture; and
 4. addition of nanofibrillated cellulose (from now on "NFC") to the fibres-filler-mixture treated with CP.

5.2.5 According to the patent (paragraph [0010], second sentence), in the method according to the invention at least the filler surface is modified by adsorption of cationic polyelectrolyte (CP) and nanofibrillated cellulose (NFC) during the furnish preparation, such that the modification creates a bilayer of cationic polyelectrolyte and NFC around the fillers, which improves the affinity between fillers and fibres. Furthermore, the fibres are also modified, because the CP and NFC are added to the fibre-filler suspension (see claim 1 and the sentence bridging pages 2 and 3 of the patent).

5.2.6 The proposed method thus allegedly aims at forming a CP-NFC bilayer around the filler and fibres, in order to promote the formation of bonds between them (paragraphs [0010]-[0012] of patent), thereby preventing the loss of mechanical properties (strength) despite the presence of fillers.

5.3 Closest prior art

5.3.1 The appellants raised several lack of inventive step objections, wherein E9, E22 or E26 were alternatively taken as suitable closest prior art disclosures. Thus, it should be established which of these documents, if any, represents the most promising springboard:

5.3.2 Document E9 (page 304, right column, last paragraph) addresses the problem of decreasing the amount of the polyelectrolyte poly(amideamine) epichlorohydrin (PAE) used in papermaking industry for environmental reasons. Therefore, the goal of E9 is to assess the ability of cellulose nanofibrils to improve the wet-strengthening effect of PAE in order to reduce the amount thereof used in papermaking. To achieve this objective, E9

proposes a method (to increase the wet and dry strength of paper) which, in particular, includes the sequential addition of PAE (CP) and then NFC to a fibre slurry (i.e. PAE adsorbs first and then NFC), in order to form a bilayer on the fibres which promotes inter-fibre bond formation, thereby improving the mechanical strength of the resulting paper (abstract and page 310, starting from left column, second paragraph). Document E9 does however not disclose the presence of any filler, hence does not address the promotion of filler-fibres bond formation.

Thus, the similarities between document E9 and the invention only concern the fibres but not the filler. It is therefore not apparent for the Board why a skilled person trying to solve the problem of maintaining good paper strength in the presence of fillers would consider this document as a promising springboard without the benefit of hindsight.

Consequently, the Board concludes that document E9 cannot be taken as the closest prior art, as this would necessarily require the benefit of hindsight, therefore invalidating from the outset any subsequent conclusion using the problem-solution approach.

- 5.3.3 Document E22 (page 3, point(C)) addresses the problem of low paper strength caused by the increase in the amount of filler. According to this document, when the filler is first flocculated and then added to the fibres, the lowering of the strength can be mitigated but at the expense of a reduction of the opacity. Thus, E22 addresses the problem of obtaining good strength while maintaining a satisfactory opacity when using fillers.

To solve this problem, E22 proposes (page 3, line 37, to page 4, line 12; page 6, lines 14-19; example 1) to disperse together (pre-mix) the filler and a microfibrillar cellulose (the NFC), to flocculate this mixture by adding a cationic polyelectrolyte (the CP) (see page 5, first full paragraph), and to finally add the flocs formed therefrom to the papermaking stock (the fibre pulp).

It is thus apparent that E22 addresses the same problem as mentioned in the patent in suit. Hence, E22, rather than E9, should be considered as the closest prior art for the assessment of inventiveness when using the problem solution approach.

- 5.3.4 Concerning the question of which part of E22 should be regarded as the closest prior art, appellant 4 argued that the skilled person would consider starting from comparative example 2 of E22 (pages 8-9) rather than relying on the exemplary teachings of this document (i.e. the preferred examples). In this respect, appellant 4 referred to decision T 1797/09, according to which there was no reason to disregard comparative examples as the closest prior art.

In order to justify the choice of comparative example 2 of E22, appellant 4 also argued that even if comparative example 2 were regarded *a priori* as a sub-optimal starting point, the skilled person would reconsider this prejudice when reading document E9, which explicitly taught that the formation of nano-aggregates (analogous to the filler-NFC-CP flocs proposed in the exemplary embodiments of E22) was detrimental for the paper strength and should therefore be avoided. Since comparative example 2 did not lead to the formation of such nano-aggregates (i.e. flocs), it

would be considered to be a better starting point than the exemplary embodiments of E22 (e.g. example 1).

The Board does not follow these arguments for the following reasons:

In decision T 1797/09 (reasons, 2.2 to 2.12) the Board had indeed started from a comparative example for assessing obviousness, based on the highest number of common features with the invention, because the only document which addressed the same problem as the invention was an Article 54(3) EPC document. Moreover, there was evidence that the two distinguishing features between the claimed subject-matter and the closest comparative example of the prior art did not provide any technical effect (thus, that the technical problem solved was the mere provision of a further composition). Finally, obviousness over the comparative example as the closest prior art was acknowledged because the distinguishing features were generally disclosed as known options in the very same document of the comparative example. Hence, this decision concerns a very particular case, which is not comparable to the present one, in which several closest prior art documents have been invoked.

Comparative example 2 of E22 discloses a method wherein filler, NFC and CP are sequentially added in this order to a fibre pulp slurry. As argued by the respondent, the results presented in table 1 on page 12 of E22 indicate that this method gives rise to the worst outcome among all of the tested alternatives in terms of internal bond strength. Thus, comparative example 2 is disclosed to illustrate the poor bond strength obtained in the absence of the filler-NFC-CP mixture flocculation step, which is proposed in document E22 as

the solution to improve paper strength despite the presence of fillers. It is not apparent for the Board why the skilled person would select the most disadvantageous starting point (having the lowest internal bond strength) for the purpose of solving the technical problem of increasing the mechanical strength of paper. As correctly pointed out by the respondent, an inventive step objection based on selecting such a clearly disadvantageous starting point would necessarily be contaminated by hindsight, since this choice could only be motivated by the previous knowledge of the claimed invention (in line with e.g. reasons 3.1 of T 1307/12).

It cannot be accepted either that, as argued by appellant 4, the skilled person would reconsider its selection of the closest prior art after consulting the content of document E9, as this would not only cast doubts as to whether E22 indeed represents the closest prior art, but, most importantly, would beg the question of why the selection of the closest prior art should be influenced by the content of a different document (in this case E9). This way of acting/reasoning clearly goes against the well-established principles of the problem-solution approach and can therefore not be accepted.

Consequently, the Board comes to the conclusion that, following the problem-solution approach, the skilled person would start from the teachings of the exemplary embodiments of E22, e.g. from example 1.

- 5.3.5 Document E26 (see page 1556, title and first two paragraphs) addresses the problem of increasing the paper strength by adding micro-fibrillated cellulose.

According to E26, the sought-for improvement can be achieved by the use of high amylose corn starch as a processing co-agent for the microfibrillar cellulose. The improvement in paper strength (in terms of tensile index) for a sheet produced with 15% filler is apparent from the paragraph bridging pages 1557 and 1558 as well as from table 1 thereof.

E26 (page 1556, fourth paragraph, last sentence) also mentions the optional use of a cationic polyacrylamide retention aid ("Percol"), falling within the scope of CP in claim 1 at issue.

With its written submissions, appellant 3 argued that the indication in E26 that "the slurry and the filler were introduced to the pulp mixing lines (...) and then retention aid was added (...)" (the "slurry" and the "retention aid" corresponding respectively to the NFC and the CP in the patent in suit) discarded the alternative of mixing NFC and filler before its introduction into the fibre suspension.

As indicated in its preliminary opinion, the Board disagrees with this argumentation. In particular, E26 discloses (page 1557, first full paragraph, last sentence) that "when oat fibre (NFC) was to be used in filled paper, the slurry (i.e. the pre-formed NFC slurry) and the filler were introduced to the pulp mixing lines prior to the headbox, and then retention aid was added directly to the headbox". Thus, while E26 clearly discloses that a filler is added before the headbox (i.e. before the addition of the CP), it does not clearly disclose whether the NFC is added to the fibre suspension before, after or together with the filler. Furthermore, E26 discloses that the NFC and the filler are fed and mixed with the cellulose fibres

prior to the headbox (page 1557, first full paragraph) in order to ensure a high loading level of additives and a complete mixing in the mixing line prior to the headbox. The method of Claim 1 at issue thus differs from the method of E26 in that the CP is added to a filler-fibres mixture before adding the NFC.

In view of the similarities in the problem being solved and of the commonality of technical features, the Board comes to the conclusion that document E26 can also be considered to represent a suitable starting point for assessing obviousness.

5.3.6 Summing up, E26 and E22 (example 1) are regarded as suitable starting points for assessing inventive step according to the problem solution approach, because they address the problem of improving the paper strength, include all the components used in the invention (fibres, filler, NFC and CP) and refer to a particular order of addition of the components.

5.4 Problem solved by the invention

5.4.1 According to the patent in suit (par. [0007]) the invention solves the problem of providing

"a novel method for preparing aqueous furnish to be used in paper and paper board manufacturing in such a way that the paper product manufactured from the furnish has a high loading of filler, with good mechanical strength (...) [and] to improve the interactions between fibres and fillers."

5.4.2 On top of the comparative tests included in the patent in suit (examples 1 and 2), two further experimental reports have been filed in the course of the

proceedings: the respondent (patent proprietor) filed a report with letter dated 21 May 2015 and appellant 3 filed a report with letter dated 5 April 2016. During the proceedings the appellants relied on these reports to argue that the claimed invention did not successfully solve the problem of improving the paper strength but simply the less ambitious one of providing an alternative method to manufacture paper having good mechanical properties.

5.4.3 As in the present case the appeals fail even if the less ambitious problem is considered, the Board decided, in favour of the appellants, to assess inventive step under the assumption that the claimed invention does not solve the problem of improving the mechanical strength of the paper, as invoked by the respondent, but the less ambitious one of providing an alternative method to manufacture paper having good mechanical properties.

5.4.4 It was not contested that this less ambitious problem was effectively solved by the claimed invention according to the main request.

5.5 Obviousness

It remains to be decided whether the skilled person, starting from either E22 or E26 and in view of the further cited prior art, would have been motivated to arrive at the subject-matter of the invention in an obvious manner.

Starting from document E22

5.5.1 When starting from the exemplary embodiments of document E22 (e.g. example 1) as the closest prior art,

and confronted to the above-mentioned technical problem, the skilled person would not find any teaching in E22 (other than to form flocs of filler, NFC and CP) which could (let alone would) lead to a step of adding the filler to the fibres before adding the NFC (let alone to add the CP before the NFC), because E22 explicitly teaches away from forming a fibre-filler suspension with the unflocked filler.

5.5.2 On the other hand, even if the skilled person had considered the teaching of E9, it would have learned to treat the fibres with CP and NFC to obtain a bilayer structure thereon, because E9 does not deal with fillers and explicitly teaches to form the bilayer solely on the fibres. Hence, the combination of the teachings of E22 with those of E9 would lead the skilled person to separately treat the fibres according to E9 and the filler according to E22 before mixing them and forming the fibre-filler mixture. Thus, even upon combining the teachings of E22 and E9 the skilled person would not arrive at a method as claimed in an obvious manner.

5.5.3 Consequently, the claimed subject-matter is not rendered obvious by E22 alone or in combination with E9.

Starting from document E26

5.5.4 The appellants argued that the indication in E26 that the filler was to be added to the pulp in the mixing lines prior to the headbox (4th paragraph of page 1556) implied that the fillers should be directly added to the fibre slurry. In any case, there would only be three possible interpretations of this paragraph: the filler was added before the NFC, the filler was added

together with the NFC or the filler was added after the NFC. Since there was no evidence that any one of these options was better than the others, the appellants concluded that they should all be considered as obvious alternatives.

Furthermore, the appellants argued that if, in order to maintain good mechanical properties, the skilled person wanted to promote inter-fibres bonding, it would have consulted E9 (abstract; page 310; figure 8) and would have learned therefrom that the NFC had to be added directly after the CP to the fibres to form a bilayer system thereon. In doing so, the skilled person would automatically have arrived at the subject-matter of claim 1, because the only technically sound alternative to incorporate the sequence CP-NFC taught in E9 into the method of E26 while maintaining the addition of the filler in the mixing lines (as required in page 1556, 4th paragraph of E26) was to add the filler before the CP. Moreover, the alternative of adding the filler after the NFC would be discarded because it would require major modifications of the method in E26, such as adding the filler to the headbox or adding all the components at different points of the mixing lines.

Finally, the appellants argued that the respondent had not provided any evidence that adding CP and then NFC to the filler-fibre mixture would provide any technical contribution over the alternative of adding these substances directly to the fibres alone. In this respect, while the patent alleged (paragraph [0010]) that a bilayer was formed around the fillers, no evidence had been submitted to prove that this was the case, i.e. that the presence of the filler contributed in any way to the formation of internal bonds in the paper. In particular, none of the submitted tests

provided a direct comparison between the sequential addition of CP and then NFC to the fibre-filler suspension (corresponding to "strategy 4" and claim 1 of the patent in suit) and a sequential addition of CP and NFC to a fibre suspension (i.e. the method disclosed in E9). Thus, there was no reason to associate the presence of the filler with the underlying effect of maintaining good mechanical strength, as this could be entirely attributed to the formation of bonds between the fibres (as it was the case in E9).

In view of the above considerations the appellants concluded that the subject-matter of claim 1 was obvious in view of E26 alone or combined with E9.

5.5.5 The Board does not agree with the arguments of the appellants for the following reasons:

-First, in view of the fact that the order of addition of the substances is critical for the underlying invention (and also relevant in E26), it is not reasonable to conclude that the skilled person would simply choose to follow the conventional pre-mixing of fillers and fibres as known in the art or as disclosed e.g. in E22. In fact, this is well illustrated in E22 itself, which refers to the conventional step of adding the fillers to the fibre suspension only to subsequently conclude that this pre-mixing step is detrimental for the paper strength and should therefore be avoided (page 2, line 13, to page 3, line 31). Furthermore, since the order of addition is important, it cannot be concluded that the three possible sequences of addition arising from the interpretation of the above cited passage in E26 would simply be regarded as obvious alternatives, let alone as obvious

alternatives for the specific purpose of maintaining good mechanical strength (i.e. the problem being solved).

- Moreover, when starting from E26, which teaches the use of a starch (rather than of a cationic starch) to treat NFC before addition to the fibre slurry, and the use of a cationic polymer, if at all, only as retention aid in the headbox, the skilled person could not learn from E9 when the filler should be added, because E9 does not deal with fillers. Instead, E9 teaches that the sequential addition of CP and NFC to fibres promotes mechanical strength due to the formation of a bilayer on the pulp fibres (i.e. without a filler). Thus, the skilled person would implement the teaching of E9 in the method of E26 by adding CP and then NFC directly to the fibres (as this would give rise to the formation of the internal fibre-fibre bonds taught in E9), which implies that the filler would be added in the last step to this mixture.

In other words, in the absence of any teaching in E9 (or any of the cited documents) that the good mechanical strength obtained when adding CP and then NFC to the fibres would also (proportionally) be obtained when the CP and then the NFC are added to a filler-containing fibre suspension, the skilled person, knowing that the presence of the filler might interfere with the formation of the bilayer on the fibres, would be prompted to avoid adding the filler to the fibres as a first step.

Therefore, even if it were assumed, in favor of the appellants, that the skilled person would regard the pre-mixing of the filler and the fibre suspension in the first step as the customary or standard way to

proceed, this sequential order would be discarded or shifted once the teachings of E9 were taken into account. There is thus no need to further consider the content of late filed document E32 (Appendix 4, e.g. page 505).

- While it is true that none of the tests on file provides a direct comparison between the sequence in claim 1 and the strategy proposed in E9, this comparison is not relevant in the present case for assessing obviousness, because as indicated above, E9 is not considered to be a suitable starting point (i.e. the technical effects of the invention are not assessed in view of E9). Furthermore, it has been assumed that the invention merely solves the problem of providing an alternative method to obtain good mechanical strength, an effect which is supported by the fact that "strategy 4" in the patent in suit (corresponding to the subject-matter of claim 1) leads to the best mechanical strength when compared to the other tested sequential orders of addition (see figure 9). In this respect, the alleged formation of a bilayer around the fillers is simply a theoretical explanation of these factual observations, so it is not apparent how it can play any role for deciding whether the claim is obvious in view of the cited prior art.

5.5.6 All in all, the subject-matter of claim 1 is not rendered obvious by E26 alone or in combination with E9 (or any of the other cited documents), because neither E9 nor any of the other cited documents provides a hint that the good paper strength obtained with the sequence of addition fibre suspension-CP-NFC would still be maintained if the CP and then the NFC were added to a fibre-filler suspension.

5.6 The subject-matter of claim 1 of the main request is thus considered to be inventive in view of the cited prior art.

Conclusio

6. The Board therefore concludes that the main request complies with the requirements of the EPC.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:



A. Pinna

G. Santavicca

Decision electronically authenticated