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**Datasheet for the decision
of 1 February 2019**

Case Number: T 0055/18 - 3.2.07

Application Number: 09156683.6

Publication Number: 2236664

IPC: D21B1/16, D21C9/00, D21D1/00,
D21H11/00, D21H11/18

Language of the proceedings: EN

Title of invention:

Process for the production of nano-fibrillar cellulose
suspensions

Patent Proprietor:

FiberLean Technologies Limited

Opponent:

Stora Enso AB OYJ

Headword:

Relevant legal provisions:

EPC Art. 100(b), 111(1)
RPBA Art. 12(4), 13(1)

Keyword:

Grounds for opposition - insufficiency of disclosure (no)
Late-filed document - admitted (no)
Appeal decision - remittal to the department of first instance
(yes)

Decisions cited:

Catchword:



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Case Number: T 0055/18 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 1 February 2019

Appellant: FiberLean Technologies Limited
(Patent Proprietor) Par Moor Centre
Par Moor Road
Par, Cornwall PL24 2SQ (GB)

Representative: Russell, Tim
Venner Shipley LLP
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Respondent: Stora Enso AB OYJ
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 2 November 2017
revoking European patent No. 2236664 pursuant to
Article 101(3)(b) EPC.**

Composition of the Board:

Chairman I. Beckedorf
Members: A. Pieracci
K. Poalas

Summary of Facts and Submissions

I. The appellant (patent proprietor) filed an appeal within the prescribed time limit and in the prescribed form against the decision of the opposition division revoking European patent No. 2 236 664 B1.

II. The opposition had been filed against the patent as a whole based on all grounds for opposition pursuant to Article 100(a) to (c) EPC.

The opposition division found that the grounds for opposition pursuant to Article 100 (c) EPC did not prejudice the maintenance of the patent as granted. The opposition division decided to revoke the patent on the grounds of insufficiency of disclosure pursuant to Article 100(b) EPC.

III. The appellant requested with the statement setting out the grounds of appeal

that the appealed decision be set aside and that the case be remitted to the opposition division for the examination of inventive step,
or, in the alternative,
that the case be remitted to the opposition division for the examination of inventive step of the claims according to the auxiliary request.

IV. The respondent in its reply requested

that the appeal be dismissed.

V. The following documents were cited by the appellant for consideration during the appeal proceedings:

D5: Chinga-Carrasco G., *Nanoscale Research Letters* 6 (2011), 417;

D6: Klemm D. et al., *Angewandte Chem. Int. Ed.* 44 (2005);

D7: McGraw-Hill *Encyclopedia of Science & Technology*, 5th edition, The McGraw-Hill Company, 1982;

D8: Pages 5-9 of the patent proprietor's submissions dated 2 March 2017.

VI. The respondent filed together with its reply the following document:

D8a: All pages of the patent proprietor's submissions dated 2 March 2017.

VII. In order to prepare the oral proceedings scheduled upon both parties' requests, the Board communicated its preliminary assessment of the case to the parties by means of a communication pursuant to Article 15(1) RPBA.

The Board indicated that the invention of the opposed patent appeared to be sufficiently disclosed and that a remittal to the opposition division according to Article 111(1) EPC to consider whether the requirements of inventive step were fulfilled appeared to be appropriate since the opposition division had not yet decided on the issue.

VIII. With a letter dated 13 November 2018, the respondent filed two further documents, namely:

D9: Pääkkö et al., *Biomacromolecules*, 8 (2007), 1934-1941;

D10: ISO - Standard 5267 - 1, Pulps - determination of drainability - Part 1: Schopper-Riegler method.

IX. Oral proceedings before the Board took place on 1 February 2019. At the oral proceedings, the appellant and the respondent confirmed their requests filed during the written procedure.

For further details of the course of the oral proceedings, reference is made to the minutes thereof.

The decision was announced at the end of the oral proceedings.

X. The parties argue as follows.

The appellant argues essentially that the respondent has not discharged the burden of proof and has not shown that the invention is insufficiently disclosed so that it cannot be carried out by a person skilled in the art. The appellant also argues that detecting the presence of primary fibrils and the absence of fibres is not necessary for carrying out the invention.

The respondent argues essentially that the burden of proof is shifted to the appellant and that the invention cannot be carried out since the person skilled in the art is not in the position of knowing when no fibres and only primary fibrils are present in the fibrillated suspension as requested by claim 1 of the patent as granted.

The parties' lines of argument, which were argued upon and confirmed during the oral proceedings, will be dealt with in detail in the reasons for the decision.

XI. Independent claim 1 according to the main request, i.e. according to the patent as granted, reads as follows:

A process for the production of nano-fibrillar cellulose suspensions, characterized by the steps of:

- (a) providing cellulose fibres in the form of a suspension;
- (b) providing at least one filler and/or pigment;
- (c) combining the cellulose fibres and the at least one filler and/or pigment;
- (d) fibrillating the cellulose fibres in the presence of the at least one filler and/or pigment until there are no fibres left and only primary cellulose fibrils are obtained.

Reasons for the Decision

- 1. The appealed decision - Burden of proof
 - 1.1 The appellant argues that according to the case law in opposition proceedings the burden of proof lies with the opponent to demonstrate that the requirements of Article 83 EPC are not met. The opposition division instead put the burden of proof on the patent proprietor and based its decision on this, so that the decision of the opposition division is wrong.

1.2 The Board agrees with the appellant.

It is established jurisprudence of the Boards of Appeal that an objection of lack of sufficient disclosure presupposes that there are serious doubts substantiated by verifiable facts. The burden of proof is upon the opponent to establish, on the balance of probabilities that a skilled reader of the patent, using his common general knowledge, would be unable to carry out the invention (see the Case Law of the Boards of Appeal, 8th Edition, 2016, II.C.8).

The opposition division admittedly put the burden of proof of sufficiency of disclosure on the appellant during opposition proceedings as it can be derived from the following passages of the reasons of the impugned decision (see point 4.2 thereof):

"...In the OD's view, the proprietor failed to provide the OD with convincing evidence establishing what is exactly the size of a primary fibril..." (see page 4, penultimate paragraph of the impugned decision);

"...Moreover, the OD is of the opinion that the proprietor did not convincingly establish what is the method for determining the presence of a primary fibrils in the aqueous suspension produced according to granted claim 1..." (see page 5, fourth paragraph of the impugned decision);

"...Although the proprietor recognised during oral proceedings that scanning electron microscopy (SEM) or transmission electron microscopy (TEM) could be used to determine the presence of nanofibrils of cellulose, no evidence has been provided in this respect by the proprietor during the proceedings..." (see page 6,

first paragraph, second sentence, of the impugned decision).

The opposition division, while putting the burden of proof on the appellant and basing its decision on such allocation of the burden of proof, failed to indicate in the reasons thereof why the appropriate principles of the established case law as set out above were not followed.

The decision of the opposition division is therefore already for this reason incorrect.

2. Shifting the burden of proof

2.1 The parties are in dispute over whether in the case at hand the burden of proof has been shifted from the respondent/opponent to the appellant/patent proprietor.

In this respect, the respondent submits that the shift is induced by the appellant which, on two occasions in opposition proceedings, demonstrated itself that the claimed invention could not be reproduced. For this, the respondent refers to document D8, i.e. the response of the patent proprietor to the grounds of opposition, in which primary fibrils are indicated on figure 2. Given the scale reported on the figure and the indication of the presence of mineral pigment particles, which have a dimension of the order of magnitude of microns, the elements indicated as primary fibrils on the figure are too big to actually be primary fibrils. A similar argument applies to the photo presented at the oral proceedings in opposition and annexed to the appealed decision, wherein mineral pigments and nano-fibrillated cellulose material are both indicated, although the order of magnitude of the

two is quite different, so that nano-fibrillated cellulose material cannot be shown in this picture. In the respondent's view, the appellant, by filing the photos of two examples of the invention in which primary fibrils cannot be identified, demonstrated that the person skilled in the art cannot carry out the invention since he cannot determine whether step d) of claim 1 has been carried out.

The appellant argues that, as indicated by the opposition division in the reasons for the decision, the photo of D8 and the photo presented at the oral proceedings are too fuzzy and pixelated for providing conclusive evidence. The fact that the appellant has filed two pixelated and fuzzy photos cannot as such relieve the respondent of the burden of proof.

- 2.2 The Board, essentially accepting the appellant's line of arguments, finds that no shift of the burden of proof has occurred and that the respondent continues to bear the burden of proof for the alleged insufficiency of disclosure.

The appellant indicated at the oral proceedings in opposition that figure 2 of D8 was not correctly labelled, and filed thereafter a further photo (see the second and third paragraphs from the bottom of page 2 of the minutes of the oral proceedings in opposition). The Board considers, therefore, that figure 2 of D8 cannot provide an appropriate piece of evidence, since its relevance was reconsidered by the appellant itself during opposition proceedings.

To this extent, the Board agrees with the opposition division that the further photo filed at the oral proceedings in opposition is fuzzy and pixelated and

therefore cannot provide proper information of what is represented therein.

The Board also concurs with the opposition division that "...optical microscopy may not be the more appropriate technique to investigate the presence of particles in a suspension having a size in the range of some nanometers, because of the size resolution allowed by using this technique..." (see under point 4.2 the sentence bridging pages 5 and 6 of the reasons of the impugned decision).

Figure 2 of D8 and the photo presented at the oral proceedings in opposition, both obtained by optical microscopy, do not therefore provide appropriate and conclusive evidence either in favour or against the reproducibility of the invention and therefore cannot discharge the respondent from carrying the burden of proof of showing that the claimed invention is insufficiently disclosed.

3. Admittance of documents D9 and D10 into the proceedings

3.1 Documents D9 and D10 were submitted and relied upon by the respondent for the first time in the appeal proceedings. The respondent argued for their admittance in the proceedings that these documents are highly relevant. The appellant objects to their admittance for reasons of late filing and lack of relevance.

Referring to D10, which is the ISO norm cited in the opposed patent for the determination of the Schopper-Riegler (SR) degree, the respondent argues that this document is relevant since it shows that the solution to be used for measuring the SR degree is a sample of a suspension of fibrous material in water. This is

different from the opposed patent in which a pigment and/or filler is also present.

The respondent argues that there is no indication in the opposed patent whether the SR measurement should be carried out in the presence or absence of filler and/or pigment. In the first case, the filler and/or pigment would affect the results of the measurements; in the second case, how to remove the filler and/or pigment from the suspension so as to carry out the measurements is not shown.

The respondent also argues that the SR value does not assess the degree of fibrillation or the dimensions of the fibrous material in the suspension being tested, but only the drainage resistance.

With reference to D9 the respondent argues that this document is relevant since it shows that even fibrillating at a high SR degree does not mean that only primary cellulose fibrils are obtained. With reference to page 1938, left column and to figure 2(b) of D9, the respondent argues that even with an SR value of 94, which is lower than the value of 95 indicated in paragraph [0048] of the opposed patent, microfibrils (diameter of 5 nanometers, corresponding to the primary fibrils of claim 1) are obtained together with thicker fibrils of 10-20 nanometers. Thus, a high SR value does not mean that only primary cellulose fibrils are obtained.

The appellant argues that document D9 does not relate to a method according to the invention and, referring to paragraph [0042] of the opposed patent, that it is not the SR value as such but its variation that is relevant for the invention.

3.2 The Board concurs with the appellant for the following reasons.

Documents D9 and D10 are cited by the respondent in relation to the issue of the SR value. The relevance of the SR value as a control parameter for the claimed process is derivable from the description of the opposed patent, see for example paragraph [0042] of the opposed patent which reads:

" ... One indication of cellulose fibrillation according to the present invention is the increase of the Schopper Riegler degree (°C) ..."

and has been addressed in detail by the appellant in its grounds of appeal.

The norm ISO 5267/1 used to calculate the SR degree is also cited several times in the opposed patent and therefore its relevance has been known to the respondent since the time of filing the opposition (see for example paragraph [0043], paragraphs [0046]-[0047] and also the paragraphs relating to the specific examples, paragraphs [0068], [0070], [0071], [0076], [0081], [0085], in which it is indicated that the SR value of the obtained suspension is measured according to ISO 5267/1).

The Board is thus of the opinion that the appellant is correct in arguing that documents D9 and D10 could have been filed well earlier.

Furthermore, the following is to be considered.

In the opposed patent it is mentioned that the SR degree is determined for the suspension with filler and/or pigment (see e.g. paragraph [0043] and also the paragraphs relating to the specific examples, paragraphs [0068], [0070], [0071], [0076], [0081],

[0085], in which it is indicated that the SR value of the obtained suspension is measured according to ISO 5267/1).

That the SR degree is a measure of the drainability of a pulp suspension is known and acknowledged in the opposed patent (see paragraph [0043]). However, as indicated in the opposed patent, the variation of the SR degree can be used according to the invention for monitoring the progress of the microfibrillation process (see paragraph [0042]).

Thus, according to the opposed patent, the method of ISO 5267/1 is to be used for a suspension with filler and/or pigment even if the ISO 5267/1 refers essentially to a suspension of pulp and water.

Document D10, i.e. ISO 5267/1 itself, does not therefore add anything to what is already known to the person skilled in the art reading the opposed patent and is thus not relevant for the decision to be taken.

As mentioned above, according to paragraph [0042] of the opposed patent "One indication of cellulose fibrillation according to the present invention is the increase of Schopper-Riegler degree". It is thus the increase of SR which gives an indication that the fibrillation is taking/has taken place when carrying out the method of the invention. That a sample of cellulose fibres treated according to a method not according to the invention and having a high SR value does not show only primary cellulose fibrils (as the respondent argues to be the case in D9) is thus not relevant and does not imply that the method of the invention cannot be carried out.

Since document D9 does not relate to a solution microfibrillated according to the invention, this

document is also not relevant for the decision to be taken.

Since documents D9 and D10 are late-filed and are not relevant for the decision to be taken, the Board has decided not to admit these documents in the proceedings in virtue of Articles 13(1) and 12(4) RPBA.

4. Sufficiency of disclosure (Article 100(b) EPC)

4.1 The appellant essentially argues that the respondent has not discharged its burden of proof and has not shown that the invention cannot be reproduced, in particular that the examples given in the patent cannot be carried out.

The patent specification provides a detailed description of the claimed invention as well as specific examples, and thus provides the person skilled in the art with sufficient information on how to establish that primary cellulose fibrils are obtained and on how to establish that there are no fibres left in the pulp suspension.

The invention addresses the problem of providing a more efficient process for obtaining nano-fibrillar cellulose suspensions (see paragraph [0021] of the patent). This problem is addressed by the addition and co-processing of certain fillers and/or pigments with cellulose fibres containing pulp (see paragraph [0022]). The invention lies in the use of fillers and/or pigments in the step of fibrillating cellulose fibres. According to the appellant the statement in granted claim 1, that "there are no fibres left and only primary cellulose fibrils are obtained" is the result of the use of fillers and/or pigment during the

fibrillation process. To carry out the invention the person skilled in the art needs only to know how to add and co-process fillers and/or pigments in the fibrillation step. Neither this technical knowledge nor the specific examples given in the patent have been put into doubt and/or proven wrong by either the opponent or the opposition division. Apart from this, in the patent specification, reference is made to the SR degree, as an indication of the degree of fibrillation according to the invention (see paragraph [0042]) and that SR degree measurements can be employed to determine if the required fibrillation has occurred (see paragraphs [0043]-[0054]).

Furthermore, it is within the skilled person's common general knowledge to employ appropriate microscopy to detect/observe objects of a specific size and that in any case from the opponent's submissions D5 and D6 it is evident that electron micrographs can be used to visualize morphological structure of cellulose, including elementary fibrils, microfibrils and microfibrillar bands (see D5, page 3 and figure 2; D6, page 3363 and figure 4). There is no need for placing too much emphasis on the ability of the skilled person to determine the size of a "primary fibril". With reference to paragraphs [0006]-[0007] of the patent and to document D7 (page 738, right hand column, lines 18-24, 36-37 and figure 2), it is apparent that the term "primary fibril" is not defined by the size of the fibril but is a term which describes a particular class of nano-fibrillated cellulose fibrils. Furthermore, the dimension of the fibres and the primary fibrils is not referred to in the claims.

4.2 The respondent argues that an invention can only be considered to be sufficiently disclosed if each and

every step of the claimed method is sufficiently disclosed. However, the patent does not disclose how to carry out step (d) of claim 1, which is of "fibrillating the cellulose fibres in the presence of the at least one filler and/or pigment until there are no fibres left and only primary cellulose fibrils are obtained". In fact, it remains unknown how to evaluate whether the two conditions of step d) of the claimed method:

- no fibres left and
- only primary cellulose fibrils are obtained,

are fulfilled.

The SR degree cannot be used to determine whether there are no fibres left and only primary cellulose fibrils in suspension, as it only relates to the drainability of the cellulose suspension and its determination is influenced by the presence of the filler and/or pigment.

Even if transmission electron microscopy (TEM) could be used to determine the presence of primary fibrils in a suspension, due to the difference in dimensions of fibres and primary fibrils, it would not be possible to determine at the same time that fibres are not present.

Should the appellant be right with the assertion that the primary fibrils are a particular class of nano-fibrillated cellulose fibrils, then the patent lacks disclosure of how to determine whether this particular class of nano-fibrillated cellulose fibrils is present in the suspension or not.

4.3 The Board, having reconsidered the submissions of the parties, in particular in the light of the arguments discussed at the oral proceedings, does not deviate from and herewith confirms its preliminary assessment of the case and is of the following opinion.

As discussed above, it is established jurisprudence of the Boards of Appeal that an objection of lack of sufficient disclosure presupposes that there are serious doubts substantiated by verifiable facts and that the opponent carries the burden of proof of showing that the invention cannot be carried out.

In the present case, the Board is of the opinion that the objection of insufficiency of disclosure raised by the respondent and shared by the opposition division is not substantiated by verifiable facts and that therefore the respondent has failed to discharge its burden of proof.

One of the main points of the impugned decision and of the line of argument of the respondent is that to carry out the claimed process a person skilled in the art should be able to carry out step (d) of claim 1 and therefore needs to know the dimension of the "primary fibrils" to be able to detect them. A method for detecting said "primary fibrils" in the suspension is also necessary. At the same time, a method is also needed for determining that no fibres are present in the suspension.

Step (d) of claim 1 requires fibrillating the cellulose fibres in the presence of at least one filler and/or pigment until there are no fibres left and only primary cellulose fibrils are obtained. This however does not require that the elements of the suspension are

detected and that their dimension is measured. In fact, claim 1 does not comprise a step of measuring the dimension of the elements of the suspension, so that the absence in the patent of a specific indication of the dimension of the primary fibrils and of a method for measuring such dimension does not affect a priori the reproducibility and thus the sufficiency of disclosure of the claimed invention.

Furthermore, it is noted that the respondent itself acknowledges that in the art the range of the dimensions of primary fibrils is known (see page 4, third paragraph of the reply to the grounds of appeal with reference to D5 and D6), as well as it is known that primary fibrils can be detected by using transmission electron microscopy (TEM) (see figure 2 of document D5 as well as page 4, second paragraph, of the submissions dated 13 November 2018). The argument presented by the respondent at the oral proceedings, that the person skilled in the art cannot determine at the same time the presence of primary fibrils and the absence of fibres, cannot be accepted. This is an assertion which remains unsubstantiated; furthermore, nothing prevents the person skilled in the art from performing the analysis for the presence of primary fibrils and absence of fibres in different steps and with different technical means.

As argued by the appellant, the patent specification mentions that one indication of cellulose fibrillation according to the present invention is the increase of the SR degree (see paragraph [0042]). In a preferred embodiment, the combination of fibres and filler and/or pigment is fibrillated until the SR degree is increased by a certain amount (see paragraph [0046] and claim 18) or, in a further preferred embodiment, until a given

value of the SR degree is attained (see paragraph [0047] and claim 19). Furthermore, it is mentioned in the patent specification (see paragraph [0051]) that in order to optimize the fibrillation, the fibre suspension is usually processed by subjecting it to several passages through the fibrillation device and that after a certain number of passages no further increase of the SR degree is achieved anymore (see paragraph [0053]).

It is noted that the patent specification acknowledges with reference to the background art that the fibrillation process may be continued until there are no fibres left and only fibrils of nano size remain (see paragraph [0010]). That this is generally possible has not been contested by the respondent or by the opposition division.

The arguments of the appellant therefore appear to be plausible. That this is not the case has not been shown by the respondent, which bears the burden of proof.

The Board holds that verifiable facts have not be presented by the respondent to support its doubts. In particular, the respondent has not shown that any of the examples of the patent are not workable or are such that step d) cannot be carried out or can only be carried out with undue burden.

Since the respondent has not shown, or at least has not convincingly put in doubt, that the person skilled in the art cannot carry out the invention taking into account the information provided in the patent and his common general knowledge, the sufficiency of disclosure of the invention of the opposed patent cannot be denied.

5. Remittal of the case to the opposition division
(Article 111(1) EPC)

The appellant requested the case to be remitted to the opposition division for examination of inventive step. The respondent agreed.

The Board also holds that a remittal to the opposition division according to Article 111(1) EPC to consider whether the requirements of inventive step are fulfilled is appropriate in this case, since the opposition division has not yet decided on this issue.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division for further prosecution on the basis of the patent as granted.

The Registrar:

The Chairman:



G. Nachtigall

I. Beckedorf

Decision electronically authenticated