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Datasheet for the decision of 8 January 2008

Case Number: T 1875/06 - 3.3.04

Application Number: 00953438.9

Publication Number: 1210869

IPC: A01H 5/00

Language of the proceedings: EN

Title of invention:
Construction of barley with decreased gel protein content

Applicant:
SAPPORO BREWERIES LTD.

Opponent:
-

Headword:
Barley/SAPPORO BREWERIES

Relevant legal provisions:
EPC Art. 54(2), 56, 111(1)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Strict standard of proof in respect of an internet disclosure"
"Inventive step of claims 1 to 8 of the main request in the light of documents (1) and (2) - (yes)"
"Remittal to the first instance - (yes)"

Decisions cited:
T 0091/98, T 0373/03, T 1134/06

Catchword:
see points (6) to (15)

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1875/06 - 3.3.04

D E C I S I O N
of the Technical Board of Appeal 3.3.04
of 8 January 2008

Appellant: (Applicant)
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 24 July 2006 refusing European application No. 00953438.9 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: U. Kinkeldey
Members: M. Wieser
R. Moufang

Summary of Facts and Submissions

I. The appeal was lodged by the Applicant (Appellant) against the decision of the Examining Division to refuse under Article 97(1) EPC (1973) the patent application EP 00 953 438.9 (published as EP-A-1 210 869), having the title: "Construction of barley with decreased gel protein content".

II. The Examining Division decided that the subject-matter of claim 1, and further of claims 2 to 10, of the only request before them, which consisted of claims 1 to 14 filed upon entry into the regional phase before the EPO, did not involve an inventive step and therefore did not meet the requirements of Article 56 EPC.

III. Claims 1 to 3 of Appellant's request before the Examining Division read:

"1. A method for constructing a barley with reduced gel protein content, which is the method for constructing a barley in which the gel protein capable of agglutinating in a gel during the extraction of proteins from the barley has been reduced, said method comprising:

introducing into the barley, a D-hordein expression suppressing nucleic acid capable of suppressing the production of the endogenous D-hordein protein of barley,
whereby the production of D-hordein is suppressed by introduction of the D-hordein expression suppressing nucleic acid and the gel protein content is thus reduced.

2. The method for constructing a barley with reduced gel protein content according to claim 1, wherein the D-hordein expression-suppressing nucleic acid can express any one of:

(a) an antisense RNA complementary to the endogenous D-hordein RNA of barley;

(b) a DNA fragment requisite for D-hordein reduction; and

(c) a gene that codes a ribozyme capable of decomposing the D-hordein mRNA.

3. The method for constructing a barley with reduced gel protein content according to claim 1 or 2, wherein the D-hordein expression suppressing nucleic acid is such that

(a) a D-hordein coding sequence encoding D-hordein is linked in a reverse orientation to the downstream of a promoter operable within the barley, so as to be able to generate the antisense RNA;

(b) a DNA fragment requisite for D-hordein is linked as a transgene between a promoter and a transcription termination factor in a normal orientation; or

(c) a gene that codes a ribozyme capable of decomposing the D-hordein mRNA whereby said gene is linked between a promoter and a

transcription termination factor in a normal orientation.

IV. The decision under appeal, as well as the present decision, refers to the following documents:

(1) Journal of Cereal Science, vol.28, 1998, pages 291 to 299; XP002936009

(2) Journal of Cereal Science, vol.24, 1996, pages 47 to 53; XP002229715

(3) URL:http://128.250.58.34/staff/kg.htm (retrieved on 2003-02-14); XP002229716

V. The decision under appeal is concerned with the requirements of Article 56 EPC only.

The Examining Division found that document (1) represented the closest state of the art and that the problem underlying the present application according to claim 1 was "the provision of an alternative method to provide barley with reduced levels of gel protein" (see points 1.2 to 1.3 of the appealed decision).

The Examining Division, considering that firstly the disadvantages of classical breeding methods, as used in document (1), were summarized in the present application, and secondly that document (3) suggested to use antisense techniques to reduce levels of hordein protein expression, decided that the subject-matter of claim 1 did not involve an inventive step contrary to the requirements of Article 56 EPC.

The same was found to apply to the subject-matter of claims 2 to 10 (see points 1.6 to 1.7 of the appealed decision).

VI. The Board expressed its preliminary opinion in a communication dated 8 August 2007.

Oral proceedings were held on 8 January 2008.

VII. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or, in the alternative, of the first, second or third auxiliary request, all filed with the grounds of appeal dated 4 December 2006.

VIII. Claim 1 of the main request is a combination of claims 1 and 3 before the Examining Division and reads:

"A method for constructing a barley with reduced gel protein content, which is the method for constructing a barley in which the gel protein capable of agglutinating in a gel during the extraction of proteins from the barley has been reduced said method comprising:

introducing into the barley, a D-hordein expression suppression nucleic acid capable of suppressing the production of the endogenous D-hordein protein of barley,
whereby the production of D-hordein is suppressed by introduction of the D-hordein expression suppressing nucleic acid and the gel protein content is thus reduced, wherein the D-hordein expression suppressing nucleic acid is such that

(a) a D-hordein coding sequence encoding D-hordein is linked in a reverse orientation to the downstream of a promoter operable within the barley, so as to be able to generate the antisense RNA;

(b) a DNA fragment requisite for D-hordein is linked as a transgene between a promoter and a transcription termination factor in a normal orientation; or

(c) a gene that codes a ribozyme capable of decomposing the D-hordein mRNA whereby said gene is linked between a promoter and a transcription termination factor in a normal orientation."

Claims 2 to 12 are identical to claims 4 to 14 before the Examining Division and refer to preferred embodiments of the method of claim 1 (claims 2 to 3), to D-hordein expression suppressing nucleic acids (claims 4 to 8), to vectors and a kit comprising the D-hordein expression suppressing nucleic acid (claims 9 to 11) and to a barley constructed by using the claimed method or the claimed kit (claim 12).

IX. The submissions made by the Appellant, as far as they are relevant to the present decision, may be summarised as follows:

Document (3) could not be subsumed under the prior art to be considered in the assessment of patentability of the present invention in view of decision T 1134/06 of 16 January 2007.

The subject-matter of the claims of the main request could not be derived in an obvious way from the disclosure in documents (1) and (2).

Reasons for the Decision

1. Document (1) discloses the production of *Hor 3* (the gene coding for D-hordein) null lines of barley. It is mentioned that several prior art studies (among them document (2)) have found that elevated D-hordein levels in barley were negatively correlated to malting quality, however the authors of document (1) state, that the relationship between hordein and malting quality is still unclear (page 291, right column to page 292, left column).

Hor 3 null lines were produced by crossing breeding lines of European barley with a barley of Ethiopian origin which lacked D-hordein (page 292, section "Material and Methods"). The results of the study confirm a correlation between the amount of D-hordein and gel protein found in barley. The gel protein content in the D-hordein null lines was found to be significantly lower than in nearly isogenic, D-hordein positive, isogenic lines (see sentence bridging pages 295 to 296 and tables I and II).

However, no significant relationship between the hordein composition and malting performance was determined. Neither the presence or absence of D-hordein nor the amount of gel protein had any effect on the malting performance of the examined barley lines (page 296, end of left column). The authors do not have

any explanation for this disagreement with prior art studies (page 298, right column, first paragraph) and conclude that the results obtained would justify more detailed studies with regard to the interactions between hordein alleles, hordein amount, grain texture and malting quality performance (page 298, right column, second paragraph).

2. Document (2), published two years before document (1), investigated the relationship between D-hordein and malting quality in barley and examined how changes in hordein composition affected malting performance (page 48, left column, first full paragraph).

Different cultivars were grown under different nitrogen regimes. The hordein composition of the grain and the malt extract of all samples were determined upon micromalting (page 48, section "Experimental").

It was found that variation in growth conditions resulted in a wide range of grain protein contents and malt extract values, as well as variation in the proportion of the individual B, C and D-hordeins in the grain. D-hordein in particular varied over a 10-fold range (tables I and III).

Document (2) reports on page 51, right column, that several older studies have shown a negative correlation between the amount of gel protein (aggregated hordein) and malt extract and wort filtration rate.

The results of the experiments of document (2) show that, of all individual hordein fractions, D-hordein displayed the strongest negative correlation with malt

extract. D-hordein, found nearly exclusively in gel protein, was therefore considered to be the limiting factor in gel protein formation (passage bridging pages 51 and 52). Although the authors of document (2) stated that the relationship between D-hordein and malting quality was complex and still not fully understood (page 51, right column, first full paragraph), they suggested that measurement of D-hordein in the grain would offer an estimate of the amount of gel protein formed during malting which correlated with malting quality. Thus, the determination of the amount of D-hordein in barley was considered to offer a more accurate guide to malting quality than the determination of total protein alone (page 52).

3. Document (3), a short abstract retrieved from the Internet, reports of investigations of genes affecting barley malting qualities. It is a summary of works carried out to improve the malting performance of Australian barley by using molecular biotechnology techniques. One specific approach mentioned is directed to the *Hor 3* gene encoding D-hordein. Lines 4 to 6 of document (3) read:

"High levels of hordein expression are usually detrimental to malt quality. To experimentally reduce levels of hordein protein expression we are using antisense genes."

Document (3) does not contain further details or results of these experiments.

4. In accordance with the problem and solution approach, the Boards of Appeal have developed certain criteria for identifying the closest prior art to be treated as a starting point for the assessment of inventive step (Article 56 EPC). The Boards have repeatedly pointed out that the closest prior art for assessing inventive step is normally a prior art document disclosing subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common (cf Case Law of the Boards of Appeal of the EPO, 5th Edition 2006, Chapter I.D.3.1).

The Examining Division, in the appealed decision, has considered document (1) to represent the closest state of the art. It was decided that the claimed subject-matter was obvious in the light of the disclosure in document (1) when combined with the disclosure in document (3).

5. Article 54(2) EPC states that the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or by any other way, before the date of filing of the European patent application.

6. The Examining Division, when posting the appealed decision on 24 July 2006, could not be aware of decision T 1134/06 of 16 January 2007. This decision contains a comprehensive analysis of the standard of proof that has to be adopted when deciding if an Internet disclosure belongs to the state of the art.

The Board in decision T 1134/06 (supra) summarises in point (2) the relevant case law of the Boards of Appeal with regard to the principle of free evaluation of evidence. In point (3) the role of the Internet in general as source for prior art is examined, whereby also earlier decisions of the Boards of Appeal are cited (e.g. T 91/98 of 29 May 2001 and T 373/03 of 2 September 2005).

7. The Board in case T 1134/06 (supra) arrives at the decision that a strict standard of proof should be applied, due to the inherently transient nature of the medium, which makes it very difficult to establish with a high degree of reliability *what* appeared on a website and *when.* Often the only certainty is the real-time certainty of the availability and content of a website in the particular moment it is viewed (point (3.2)).

8. The relevant passage in point (4.1) of the reasons reads:

"Thus, the fact that an Internet disclosure is state of the art under Article 54(2) EPC should be proved 'beyond any reasonable doubt'. The particular facts and evidence required will depend on each individual case, but will normally have to meet the criteria established by the jurisprudence of the Boards of Appeal in respect of a prior use or a prior oral disclosure, i.e. answer the questions of *when* the Internet disclosure was made available to the public, *what* was made available and *under which circumstances* was it made available to the public. Concerning the latter question, it will in most cases be necessary to address the main concern of reliability surrounding the Internet, in particular so

as to establish whether and in how far a retrieved disclosure is true to the disclosure appearing at that date."

9. The present Board, fully agreeing with this finding in decision T 1134/06 (supra), will thus apply this strict standard of proof to document (3), retrieved from the Internet by the Examining Division when establishing the Supplementary European Search Report.

10. Document (3) is a printout of a web page. At the date of the present decision, the URL indicated in the Supplementary European Search Report, namely http://128.250.58.34/staff/kg.htm, did not permit retrieval of document (3) or of any other document.

The last two lines of document (3) read:

"This page is maintained by Graham Parslow [*e-mail address omitted by the Board*] using HTML Author. Last modified on 10/25/95."

The right-hand top corner of document (3) shows a box containing three entries. The first is designated "P.D." (publication date) and contains the handwritten information "25 10-1995", thus the same date, although in a different format, as indicated in the last sentence of document (3). The other two entries are not relevant for the present issue and designate the page numbers ("P.") and the total number of pages indicted in a circle.

11. To the Board's knowledge the box and the information contained therein are routinely added to a document

during the procedure before the department of first instance after it has been retrieved at a search by the Examining Division.

12. However, the date given in the last sentence of document (3) ("10/25/95") is the date of completion of the document by its author and does not contain information concerning the publication of the document. Such "author date" does not allow to draw any conclusion with regard to the question when, or if at all, a document has become available to the public.

13. The only other date associated with document (3) is the date indicating in the Supplementary European search report when the document has been retrieved from the Internet by the Examining Division. This date, namely 14 February 2003 lies three and a half years after the priority date of the present application.

14. On the basis of the information provided it would have been necessary to investigate further if a document having the content of document (3) was available to the public before the priority date of the present application. Though such further investigation might reveal that the document retrieved by the Examining division during the Supplementary European Search was available to the public at the relevant date, this is by no means self-evident.

Proof of the above assumption regarding public availability of document (3) will depend on suitable further evidence. The Board considers it *plausible* that the website retrieved by the Examining Division was accessible to the public at the relevant date of the

present application and contained the technical information of document (3), which would thus belong to the state of the art under Article 54(2) EPC. However, though this may be likely, the reasonable doubts which are due to the inherently unreliable nature of the Internet must be removed before the document can indeed be taken into consideration in the present case for assessing patentability.

15. The Board is therefore inclined to exercise its discretion under Article 111(1) EPC and to remit the case to the Examining Division for further examination in order that it may carry out a further investigation to obtain the necessary evidence outlined above. In as far as a reasonable effort to obtain such further evidence is unsuccessful, the examination should be carried out without considering document (3) as included in the state of the art.

16. However, while remitting the case, the Board, in order not to unnecessarily delay the present procedure, will examine whether the subject-matter of claims 1 to 8 of the main request (corresponding to claims 1 to 10 of the request before the Examining Division) meets the requirements of Article 56 EPC in the light of the disclosure in the other prior art documents cited in the appealed decision, namely documents (1) and (2).

17. Claim 1 of the main request is concerned with a method for constructing a barley with reduced gel protein content.

Such methods are referred to in both, documents (1) and (2). However, document (1) discloses a breeding method aiming at the production of *Hor 3* null lines, and thus

at the suppression of the production of D-hordein, while document (2) refers to a method whereby, as a result of cultivation at different nitrogen regimes, cultivars with different D-hordein content are obtained.

Therefore, document (1), having the most technical features in common with the subject-matter of claim 1 of the main request, is considered to represent the closest state of the art.

18. In agreement with the Examining division, the Board considers the problem to be solved according to claim 1 of the present application to be the provision of an alternative method to produce a barley with reduced gel protein content.

19. Neither document (1) itself nor document (2) suggest that a skilled person trying to solve this problem should amend the teaching of document (1) and replace the classical breeding methods disclosed therein by the techniques of molecular biology according to claim 1 (see points (2) and (3) above).

20. The Board is aware that the disadvantages of classical breeding techniques have been well known in the relevant art at the priority date of the present application (see paragraphs [0010] and [0109] of the application as published). Moreover, there is no doubt that the techniques mentioned in items (a) to (c) of claim 1 per se were part of the common general knowledge of a skilled person in the field of plant genetic engineering. This has not been disputed by the Appellant and is evident from the citation of various

general textbooks in the experimental part of the application.

21. However, the technical feasibility of an invention is only one necessary requirement for the practicability but is not sufficient to render obvious what was actually achievable for a skilled person. The fact that a method was known to a skilled person so that he/she had the intellectual possibility to apply this method for a specific purpose merely establishes the possibility of using such method in such manner; i.e. that the skilled person **could** have used it. However, if it has to be established that such intellectual possibility was also a technical measure, which it was obvious for the skilled person to use, it is necessary to show that there was a recognisable pointer in the state of the art to apply the method known per se for the specific purpose for achieving the intended technical effect; i.e. the skilled person **would** have made such combination.

Although the disadvantages of classical breeding techniques were known to a skilled person and although methods of molecular biology overcoming said disadvantages belonged to the general knowledge of a skilled person, in the absence of a recognisable pointer in either of document (1) or (2) to apply these methods for constructing a barley with reduced gel protein content, the subject-matter of claim 1 of Appellant's main request is not considered to be derivable in an obvious way from the disclosure in these two documents. The same applies to the subject-matter of claims 2 to 8.

22. To conclude, the Board finds that the subject-matter of the claims, which were found in the decision under appeal not to meet the requirements of Article 56 EPC in the light of the disclosure in documents (1) and (3), is not obvious from the disclosure in documents (1) and (2) and, exercising its discretion under Article 111(1) EPC, remits the case to the department of first instance for further examination and in particular to carry out further investigations as outlined in points (8) to (15) above.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution on the basis of claims 1 to 12 of the main request filed with the grounds of appeal dated 4 December 2006.

Registrar: Chair:

P. Cremona U. Kinkeldey