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Datasheet for the decision of 26 January 2023

Case Number: T 2952/19 - 3.3.09

Application Number: 04803032.4

Publication Number: 1706477

IPC: A23K10/14, C12C5/00, C12C7/16, C12C7/04

Language of the proceedings: EN

Title of invention:
MASHING PROCESS

Patent Proprietor:
Novozymes A/S

Opponent:
DSM IP Assets B.V.

Headword:
Mashing process/NOVOZYMES

Relevant legal provisions:
EPC Art. 54, 56, 100(b), 100(a)
RPBA 2020 Art. 13(2)

Keyword:
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - non-obvious alternative
Amendment after summons - exceptional circumstances (no) - novelty objection raised for the first time at the oral proceedings before the board not admitted into the proceedings
Stay of the proceedings in view of G 2/21 (no)

Decisions cited:
T 0116/18

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2952/19 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 26 January 2023

Appellant: (Opponent)	DSM IP Assets B.V. Het Overloon 1 6411 TE Heerlen (NL)
Representative:	DSM Intellectual Property P.O. Box 4 6100 AA Echt (NL)
Respondent: (Patent Proprietor)	Novozymes A/S Krogshøjvej 36 2880 Bagsvaerd (DK)
Representative:	Potter Clarkson Chapel Quarter Chapel Bar Nottingham NG1 6HQ (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 September 2019 rejecting the opposition filed against European patent No. 1706477 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	A. Haderlein
Members:	M. Ansorge
	F. Blumer

Summary of Facts and Submissions

I. The opponent (appellant) lodged an appeal against the opposition division's decision to reject the opposition.

II. With its notice of opposition, the opponent had requested that the patent be revoked on the grounds for opposition under Article 100(a) EPC in conjunction with Articles 54 and 56 EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC.

III. The opposition division decided, *inter alia*, that the invention could be carried out, that the subject-matter of claim 1 as granted was novel and that the subject-matter of independent claims 1 and 14 as granted involved an inventive step in view of D15, D17 or D18 as the closest prior art.

IV. The following documents were cited in the proceedings:

D3: WO 96/37627 A1
D15: G. Kabaktschieva, Wl. Atanosow and Jord. Platikanow, "*Verbesserung der Abläuterung und der Bierfiltration durch Enzympräparate*", Brauindustrie 11/93, pages 1159 and 1160
D17: Sten Aastrup and W. Hannemann, "Extract Yield in Relation to Choice of Raw Materials, Brewing Regimes and Enzyme Addition", MBAA TQ, vol. 37, no. 1, 2000, pages 85 to 88
D18: WO 95/23514 A1
D31: Declaration of Dr. Christian Isak Jørgensen concerning the composition analysis of Ultraflo® L

V. Independent claims 1 and 14 as granted (main request) read as follows:

"1. A process for production of a mash having enhanced filterability and/or improved extract yield after filtration, which comprises: preparing a mash in the presence of enzyme activities and filtering the mash to obtain a wort, wherein the enzyme activities comprise:

a) a xylanase of GH family 10 present in an amount of at least 15% w/w of the total xylanase and endoglucanase enzyme protein, and

b) an endoglucanase of family GH12, GH7 and/or GH5 in an amount of at least 40% w/w of the total xylanase and endoglucanase enzyme protein."

"14. A composition comprising;

a) a GH10 xylanase present in an amount of at least 15% w/w of the total enzyme protein; and

b) a GH12, GH7 and/or GH5 endoglucanase present in an amount of at least 20% w/w of the total enzyme protein."

Claims 2 to 13 and 15 to 25 are directly or indirectly dependent on claim 1 or claim 14.

VI. Hereinafter, the enzymes defined in claims 1 and 14 will be referred to as GH5, GH7, GH10 and GH12.

VII. The parties' relevant arguments, submitted in writing and during the oral proceedings, are reflected in the reasons for the decision below.

VIII. Requests

The appellant requested that the decision be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed or that the patent be maintained on the basis of one of auxiliary requests 1 to 7, all of which were filed with the reply to the grounds of appeal.

Reasons for the Decision

MAIN REQUEST

1. Article 100(b) EPC

1.1 The appellant argued that the invention could not be carried out. It submitted in essence that the patent did not demonstrate that a mash having enhanced filterability and/or improved extract yield after filtration, as required in claim 1, could be obtained over the whole claimed range. The core argument of the appellant was that the feature "having enhanced filterability and/or improved extract yield after filtration" in claim 1 was to be understood as an improvement over known enzymes used in brewing, such as Ultraflo®. With respect to claim 14, the appellant argued that the patent failed to disclose how the "total enzyme protein" should be determined.

1.2 The board cannot accept the appellant's arguments for the following reasons:

1.2.1 Claim 1 relates to a process for production of a mash having enhanced filterability and/or improved extract yield after filtration. While it is true that the patent is interested in a process that is improved over the prior art, as mentioned in paragraphs [0002] and [0032] of the patent, for example, this does not mean that claim 1 requires an improvement over known enzymes. The feature "having enhanced filterability and/or improved extract yield after filtration" in claim 1 is to be interpreted as it is, wherein the feature is broad in meaning and does not have a specific reference point. Given its broad meaning, the board interprets the feature as having enhanced filterability and/or improved extract yield after filtration over a mashing process having no added enzymes. This interpretation is in line with the description of the patent. Reference is made, in particular, to paragraph [0032] on page 4, lines 10 to 19, of the patent, to which the appellant explicitly referred (see page 3, lines 1 to 11 from the bottom, of its grounds of appeal), arguing that it was known in the art that enzyme compositions comprising xylanases and endoglucanases enhance filterability and improve extract yield.

1.2.2 The appellant argued that the technical effect of enhanced filterability and improved extract yield cannot be achieved over the entire scope of claim 1. However, in view of the board's interpretation of claim 1 as set out in section 1.2.1 above, there is no doubt that a mash produced according to claim 1 has the defined effects over a mash produced without such enzymes.

1.2.3 In the board's view, the appellant's argument that there is no improvement over known enzyme compositions

such as Ultraflo® (see D15 or D17) is at best relevant to the question of inventive step, and has an impact on how the objective technical problem should be formulated.

1.2.4 The appellant also stressed that the experiments shown in Tables 15 to 21 of the patent were predominantly outside the claimed range since they failed to fulfil the compositional requirements of claim 1. However, even if this is the case, there is no absolute requirement that a patent needs to contain examples according to the invention. The burden of proof to demonstrate a lack of sufficiency is generally on the opponent. As mentioned above and considering the board's interpretation of claim 1 as set out in section 1.2.1 above, no evidence that could qualify as verifiable facts was provided in support of the appellant's argument.

1.2.5 Moreover, the appellant argued that the patent fails to sufficiently disclose endoglucanases according to EC 3.2.1.4 that can be used, or methods for testing them. The board does not agree. A skilled person having knowledge of the patent will be familiar with the respective enzymes defined in claim 1 and the way they are classified and tested.

1.2.6 Finally, the appellant argued that claim 1 did not contain any absolute amounts for the xylanases and endoglucanases defined in claim 1, so a xylanase of GH family 10 and an endoglucanase of family GH12, GH7 and/or GH5 could, while ostensibly meeting the requirements of claim 1, be added in infinitesimally small amounts in the claimed process. Under these circumstances, the appellant argued, it was not credible that the required effects could be achieved.

In the absence of any evidence, e.g. by way of experimental data, and considering the fact that the claims need to be construed with a mind willing to understand, these arguments are considered unfounded.

In view of the above, the subject-matter of claim 1 meets the requirements of Article 83 EPC.

1.3 The term "total enzyme protein" in claim 14 was criticised by the appellant under Article 100(b) EPC. The appellant argued that the patent failed to disclose how the "total enzyme protein" should be determined. The board is unable to see how this could lead to a lack of sufficiency. At best, the appellant's objection in this respect might be considered a clarity objection. The board has no doubt that a skilled person would be capable of producing a composition as defined in claim 14 without difficulty.

Thus, the ground for opposition pursuant to Article 100(b) EPC does not prejudice the maintenance of the patent.

2. Novelty

2.1 The appellant raised novelty objections against the subject-matter of claim 1 in view of D15 and D17.

2.2 The board cannot accept the appellant's arguments for the following reasons:

2.2.1 D15 is a document relating to the use of the commercially available enzyme composition Ultraflo® L in a mashing process, which describes the advantages thereof for lowering viscosity and improving filterability. D17 is similar in scope and also describes the enzyme composition Ultraflo® L. In essence, the disclosure of D17 is comparable to that of D15, and therefore the differences identified between the claimed subject-matter and D15 also apply to D17.

2.2.2 The appellant argued that the amount of GH10 and the amount of GH5, GH7 and/or GH12 in claim 1 are to be based only on the amounts of GH5, GH7, GH10 and GH12, as the total xylanase and endoglucanase enzyme protein. In its view, no other xylanases and endoglucanases are to be considered. The appellant calculated the amounts of the respective enzymes in Ultraflo® L as described in D15 and D17, and concluded that Ultraflo® L contained 49.4% w/w GH10, based on GH5, GH7, GH10 and GH12, and 50.6% w/w GH5, GH7 and GH12, based on GH5, GH7, GH10 and GH12.

2.2.3 However, the appellant's interpretation of the "total xylanase and endoglucanase enzyme protein" is not correct.

2.2.4 It follows from the wording of claim 1 that the term "total xylanase and endoglucanase enzyme protein" is to

be interpreted as referring to any xylanase and endoglucanase enzyme protein and not only to GH5, GH7, GH10 and GH12.

2.2.5 The respondent, which is the company producing Ultraflo® L, explained that Ultraflo® L contains other xylanases and endoglucanases in addition to those defined in claim 1 (see point 9. of D31). The appellant did not provide any evidence to the contrary. Thus, the board has no reason to doubt the respondent's explanation with respect to the composition of Ultraflo® L given in D31.

2.2.6 The appellant criticised the fact that the opposition division did not indicate where the patent disclosed that the term "total xylanase and endoglucanase enzyme protein" meant the totality of any xylanases and endoglucanases present, not just those explicitly mentioned in claim 1. However, as mentioned above, this is clear from the wording of claim 1.

2.2.7 The appellant referred to paragraphs [0063], [0068], [0070] and [0071] of the patent and alleged that GH10 is the only enzyme counting for xylanase and GH5, GH7 and/or GH12 are the only enzymes counting for endoglucanase. However, the board cannot see how this assertion can be true. These passages teach that generally, xylanases and endoglucanases within the meaning of the patent are those classified in EC 3.2.1.8 and EC 3.2.1.4. These are those referred to by the expression "total xylanase and endoglucanase enzyme protein" in claim 1, whereas the specific enzymes said "to be used in the present invention" are those which should be in an amount of at least 15% w/w and at least 40% w/w, respectively.

2.2.8 Under the present circumstances, the board sees no reason to doubt the respondent's calculations provided in D31 which, in principle, are not contested by the appellant, whose main thrust is that the term "total xylanase and endoglucanase enzyme protein" in claim 1 should be interpreted differently from the board's interpretation.

As can be taken from D31 (see point 27.), the amounts of GH5, GH7, GH10 and GH12 present in Ultraflo® L (as disclosed in D15 and D17) are as follows:

- 24.3% w/w of GH10, based on the total xylanase and endoglucanase enzyme protein, and 24.9% w/w of GH5, GH7 and GH12, based on the total xylanase and endoglucanase enzyme protein; and

- 6.4% of GH10, based on the total enzyme protein, and 6.6% of GH5, GH7 and GH12, based on the total enzyme protein.

2.2.9 Thus, the amount of GH5, GH7 and/or GH12, based on the total xylanase and endoglucanase enzyme protein, in Ultraflo® L, as disclosed in D15 or D17, i.e. 24.9% w/w, does not fall within the range of "at least 40% w/w" as specified in claim 1.

The subject-matter of claim 1 is therefore novel over D15 and for the same reasons also over D17.

2.3 At the oral proceedings before the board and for the first time in the entire proceedings, the appellant raised a novelty objection in view of D18, a document that has been on file since 2018. The appellant explained that it had discovered a potentially novelty-destroying disclosure in D18 the day before the oral

proceedings. It further submitted that this new objection was *prima facie* highly relevant. However, the appellant did not provide other facts or arguments that could qualify as "exceptional circumstances" within the meaning of Article 13(2) RPBA. This new novelty objection has not been admitted into the appeal proceedings since no exceptional circumstances can be discerned that could justify the introduction of a new objection at the oral proceedings (Article 13(2) RPBA). Thus, this new novelty objection has not been considered in the present case.

2.4 Therefore, the claimed subject-matter is novel and the ground for opposition pursuant to Article 100(a) in conjunction with Article 54 EPC does not prejudice the maintenance of the patent.

3. Inventive step

3.1 The appellant argued that the subject-matter of claim 1 did not involve an inventive step in view of D15 alone, D15 in combination with D3 or in view of D17 alone, and that the subject-matter of claim 14 lacked an inventive step in view of D15, D17 and D18.

3.2 The board is not convinced for the following reasons:

3.3 Claim 1

3.3.1 The appellant argued that the subject-matter of claim 1 differs from D15 or D17 as the closest prior art in the amount of 40% w/w of GH5, GH7 and/or GH12. In its view, the objective technical problem in view of D15 or D17 was the provision of an alternative process.

3.3.2 There was agreement between the parties on the distinguishing feature over D15 and D17. However, the parties had a different opinion on how the objective technical problem should be formulated.

3.3.3 Even when adopting in the assessment of the inventive step of claim 1 the objective technical problem as proposed by the appellant, i.e. the provision of an alternative process, the claimed process is considered to involve in inventive step for the reasons set out below.

3.3.4 With respect to the question of obviousness, the appellant argued that the enzyme activities claimed in claim 1 are no more than an arbitrary selection of alternatives that are known from the prior art.

3.3.5 However, firstly, the exact composition of Ultraflo® L (i.e. the composition referred to in D15 and D17) is not known from the file. It is merely derivable from D31 that Ultraflo® L contains 24.3% w/w GH10, based on the total xylanase and endoglucanase enzyme protein, and 24.9% w/w GH5, GH7 and GH12, based on the total xylanase and endoglucanase enzyme protein. However, other enzymes are also present in Ultraflo® L (see D31).

Secondly, Ultraflo® L is an optimised commercially available product which by its nature represents a "point-like" disclosure.

Thirdly, there does not seem to be anything on file that might motivate a skilled person to modify such a commercial product. What is more, a rather significant modification of Ultraflo® L, i.e. an increase of the amount of GH5, GH7 and/or GH12 from 24.9% w/w to at

least 40% w/w, based on the total xylanase and endoglucanase enzyme protein, would be necessary in order for it to fall within the claimed scope.

3.3.6 Under the present circumstances, the board does not see that it is obvious to a skilled person to significantly increase the amount of GH5, GH7 and/or GH12 in order to arrive at the claimed process, bearing in mind that the enzyme composition disclosed in D15 and D17 is an optimised commercial product representing a "point-like" disclosure. Although there might be obvious modifications in a case where a specific commercial product, such as Ultraflo® L, is the starting point in assessing inventive step, the board does not see that a skilled person would significantly modify this product. At least, a skilled person would not significantly amend the essential features of such a product, i.e. in this case the essential enzymes of Ultraflo® L.

3.3.7 The appellant argued that when faced with the problem of providing an alternative only, a motivation for a skilled person to modify the product was not necessary at all.

3.3.8 However, even if the objective technical problem were merely the provision of an alternative, it still has to be assessed whether or not the modification necessary to fall within the scope of the claim is obvious to a skilled person. Certainly, non-obvious alternatives do exist in cases where no improvement over the prior art can be acknowledged. The assessment of obviousness is to be performed on a case-by-case basis, taking the specific circumstances of the individual case into account.

3.3.9 Although commercial products (as in the present case) may well be the closest prior art, these are sometimes less promising springboards than documents having a detailed surrounding teaching. A successful inventive-step attack starting from a "point-like" disclosure, such as a commercial product, and intending to show that an alternative thereto is obvious to a skilled person requires some indication as to why this modification leading to the alternative is indeed obvious. This is particularly important in cases where the springboard in the inventive-step assessment is a "point-like" disclosure, as in the present case. In the case at hand, the board does not see that the necessary modification is obvious to a skilled person.

3.3.10 While in typical cases of a selection invention arguing that the modification is merely an arbitrary selection with respect to the general disclosure given in a document may, under certain circumstances, be sufficient to deny inventive step, this does not apply to the present specific case where a significant modification is necessary for bridging the gap between the "point-like" disclosure of Ultraflo® L and the claimed subject-matter.

In view of the above, the claimed process is considered to be a non-obvious alternative in view of D15 or D17, each taken alone.

3.3.11 The same outcome is achieved when considering D15 in combination with D3. The board shares the respondent's view that the combination of D15 with D3 is contrived and was considered with retrospective knowledge of the invention. D3 does not teach significantly increasing the amounts of GH5, GH7 and/or GH12 to arrive at the claimed process in an obvious manner.

Thus, the subject-matter of claim 1 involves an inventive step in view of D15 or D17 as the closest prior art.

3.4 Claim 14

3.4.1 For similar reasons to those set out above with respect to claim 1, the board does not see that it might be obvious to a skilled person having knowledge of D15 or D17 how to arrive at the composition of claim 14.

3.4.2 Even when assuming again that the technical problem to be solved in view of D15 or D17 as the closest prior art was merely the provision of an alternative composition, the claimed composition involves an inventive step in view of D15 or D17.

3.4.3 From D31 it can be derived that Ultraflo® L, as used in D15 and D17, contains 6.4% of GH10, based on the total enzyme protein, and 6.6% of GH5, GH7 and GH12, based on the total enzyme protein.

3.4.4 However, claim 14 requires a much higher amount of GH10 of at least 15% w/w, based on the total enzyme protein, and a much higher amount of GH5, GH7 and/or GH12 of at least 20% w/w, based on the total enzyme protein.

3.4.5 Under the present circumstances, the board does not see that it is obvious to a skilled person to significantly increase (i) the amount of GH10 and (ii) the amount of GH5, GH7 and/or GH12 in order to arrive at the claimed composition, again bearing in mind that the enzyme composition disclosed in D15 and D17 is an optimised commercial product representing a "point-like" disclosure. Although there might be obvious

modifications in a case where a commercial product, such as Ultraflo® L, is the starting point in assessing inventive step, the board does not see that a skilled person would significantly modify this product. At least, a skilled person would not significantly amend the essential features of such a product, i.e. the essential enzymes of Ultraflo® L.

The claimed composition is considered a non-obvious alternative in view of D15 or D17.

Thus, the subject-matter of claim 14 involves an inventive step in view of D15 or D17 as the closest prior art.

3.4.6 With respect to the question of inventive step in view of D18 as the closest prior art, the board makes the following observations:

D18 discloses a composition comprising GH10 (xylanase II) in an amount of 97% w/w of the total enzyme protein and GH7 (endoglucanase I) in an amount of 2.7% w/w of the total enzyme protein (see Example 3 of D18; calculations by the appellant).

Accordingly, the subject-matter of claim 14 differs from D18 in that it requires a significantly higher amount of GH5, GH7 and/or GH12 of at least 20% w/w, compared to the amount of GH7 of 2.7% w/w in Example 3 of D18. The parties were in agreement in this respect.

Even when assuming again that the technical problem to be solved in view of D18 as the closest prior art is the provision of an alternative composition, the claimed composition involves an inventive step in view of D18.

The board does not see that the significant increase of the endoglucanase GH7 (a more than seven-fold increase of the amount of GH7 compared to Example 3) that would be necessary for it to fall within the claimed scope is obvious to a skilled person having knowledge of D18.

In this context, the appellant referred to Example 3, in particular to page 23, lines 1 to 15, and Figure 1 of D18 and argued with respect to the question of obviousness that a person skilled in the art would not need any inventive skill to find optimal concentrations of a composition comprising a GH10 xylanase and a GH5, GH7 and/or GH12 endoglucanase in view of D18. D18 discloses the following on page 23, lines 3 to 5: "A remarkable reduction of the viscosity is seen when xylanase II (GH 10) is combined with especially endoglucanase I (GH 7) and the 43 kD cellulase". Hence, based on the disclosure in D18, a person skilled in the art had an incentive to optimise the enzyme mixture comprising GH10 and GH 7.

In essence, the appellant argued that a skilled person having knowledge of D18 would increase the amount of endoglucanase I (GH7) to fall within the scope of claim 1 in an obvious manner.

The board is not convinced.

D18 is directed to the use of xylanase preparations for reducing the viscosity of a plant material and for separating a plant material (see page 1, lines 5 to 9, of D18). As can be taken from page 7, lines 4 to 9, of D18, xylanase II (GH10) is of particular use for the purpose desired in D18. In particular, D18 teaches that the use of xylanase II is suitable for reducing

viscosity. This is clear from page 23, lines 1 and 2, of D18, which explains that no other enzymes reduce the viscosity at the same level as xylanase II.

D18 does not teach significantly increasing the amount of the endoglucanase enzyme GH7.

To fall within the claimed range of claim 14 it would be necessary to significantly increase the amount of endoglucanase I (GH7) from a value of 2.7% w/w to at least 20% w/w, i.e. an increase of more than seven-fold the amount given in Example 3, while at the same time significantly reducing the amount of xylanase II (GH10).

The appellant argued that a person skilled in the art has an incentive to optimise the enzyme mixture comprising GH10 and GH7 and referred in this respect to the first paragraph on page 23 of D18.

Although a certain increase of the amount of endoglucanase I (GH7) might indeed be within the ambit of obvious modifications, the board is unable to see that a skilled person having knowledge of D18 would increase the endoglucanase I (GH7) to such a significant extent that it would fall within the claimed range. In this context, it is noted that this increase of endoglucanase I (GH7) would be to the detriment of the amount of xylanase II (GH10) which, however, is taught in D18 as being an essential enzyme. Thus, the board concludes that the claimed composition is a non-obvious alternative in view of D18.

Thus, the subject-matter of claim 14 also involves an inventive step in view of D18 as the closest prior art.

For the same reasons as those given for claims 1 and 14, the subject-matters defined in the remaining claims, which are directly or indirectly dependent on claim 1 or claim 14, represent non-obvious alternatives in view of the closest prior art.

Therefore, the claimed subject-matter involves an inventive step and the ground for opposition pursuant to Article 100(a) in conjunction with Article 56 EPC does not prejudice the maintenance of the patent.

4. Stay of the proceedings in view of the pending referral G 2/21

The appellant requested that the present case be stayed in view of the pending referral G 2/21.

When assessing the allowability of the respondent's main request, the board has not relied on any evidence which was filed in support of a technical effect and which is to be considered "post-published" within the meaning of the referring decision (see T 116/18, Reasons 11.1). Thus, the present case does not depend on the outcome of the pending referral G 2/21. The request for a stay of the appeal proceedings has not been granted at least for this reason.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Schalow A. Haderlein

Decision electronically authenticated