

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No.23

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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Ex parte RENATA GRIFANTINI,  
GIANNI FRASCOTTI,  
GIULIANO GALLI, and  
GUIDO GRANDI

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Appeal No. 2001-2506  
Application No. 08/415,658

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HEARD: June 13, 2002

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Before WINTERS, ADAMS, and GREEN, Administrative Patent Judges.

GREEN, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-15. Claims 1, 13 and 14 are representative of the subject matter on appeal, and read as follows:

1. A process for the production of D- $\alpha$ -amino acids by the stereospecific conversion of racemic mixtures of 5-substituted hydantoins wherein the conversion reaction is carried out in the presence of a microorganism transformed with the plasmid pSM651 CBS 203.94 capable of expressing at high levels and without inducers an enzymatic system capable of converting said hydantoins into the corresponding D- $\alpha$ -amino acids.

13. Plasmid pSM651 deposited at the Bureau Voor Schimmelcultures, SK Baarn (Holland) where it has received the deposit number CBS 203.94.
14. A microorganism selected from Bacillus subtilis and Escherichia coli transformed with the plasmid pSM651.

The examiner relies upon the following references:

|   |             |               |
|---|-------------|---------------|
| Olivieri et al. (Olivieri)                          | 4,312,948   | Jan. 26, 1982 |
| Neal et al. (Neal)                                  | WO 94/00577 | Jan. 6, 1994  |
| European Patent Application<br>Nanba et al. (Nanba) | 0 515 698   | Dec. 12, 1992 |

The claims stand rejected under 35 U.S.C. § 103(a). After careful review of the record and consideration of the issues before us, we reverse.

#### BACKGROUND

The claims are drawn to a method of producing D- $\alpha$ -amino acids through the stereospecific conversion of 5-substituted hydantoins. The conversion is achieved through the use of a microorganism that has been transformed with a plasmid capable of expressing D-hydantoinase and D-N-carbamoylase enzymes without the introduction of an inducer. See Specification, page 1. The plasmid required by the claims is the pSM651 plasmid, which has been deposited at the Bureau Voor Schimmelcultures, SK Baarn (Holland), and has a deposit number of CBS 203.94. See id. page 16.

#### DISCUSSION

Claims 1 and 4-15 stand rejected as obvious over the combination of Neal and Nanda. Claims 2 and 3 stand rejected over the combination of Neal and Nanda, further in view of Olivieri.

According to the examiner, Neal teaches recombinant DNA vectors that produce high levels of carbamoylase and/or hydantoinase enzymes in homologous or heterologous hosts, and their use in the production of D- $\alpha$ -amino acids. The carbamoylase and hydantoinase genes as taught by Neal have a nucleotide sequence that is identical to the genes of the present invention. See Examiner's Answer, pages 4-5. The rejection acknowledges that "the difference between Neal et al., and the instant application is the choice of DNA vector into which the A. radiobacter carbamoylase and hydantoinase genes are cloned, and the choice microorganisms transformed with the vector." See id. at 5. Based on the teachings of Neal alone, the rejection concludes that

it would have obvious to one of ordinary skill in the art at the time the invention was made to construct a high copy vector containing the A. radiobacter carbamoylase and hydantoinase genes, transform homologous and heterologous host cells, express the encoded enzymes, and produce D- $\alpha$ -amino acids from 5-substituted hydantoins in a culture system, because insertion of these genes into a functionally similar high copy vector would be expected to result in high levels of expression of both genes, in either A. radiobacter or E. Coli. Although the preferred vector disclosed in this application is pSM671, a vector containing both the A. radiobacter carbamoylase and hydantoinase genes could be constructed "from plasmids, cosmids and bacteriophages known in the art" (see instant application page 11, lines 22-25). Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to express the A. radiobacter carbamoylase and hydantoinase genes using a non-inducible promoter because Neal [ ] explicitly suggests the use of non-inducible promoters to optimize the expression of active, soluble A. radiobacter carbamoylase in E. Coli without the expense and inconvenience of chemical inducers. (see page 9, lines 19-23).

Id. at 5-6.

Nanba is cited for teaching the expression of the A. radiobacter carbamoylase gene in heterologous hosts such as B. subtilis, among others.

Olivieri is cited for teaching the isolation and immobilization of an Agrobacterium enzyme system on a solid support for use in the conversion of D,L-5-substituted hydantoins to the corresponding D-amino acids.

Appellants argue in response to the rejection that although Neal discloses a “wish” to use non-inducible promoters, Neal does not enable their use, and that Neal in fact teaches away from non-inducible promoters because all of the disclosed data pertains to the use of inducible promoters. See Appeal Brief, page 4. In addition, appellants argue there is nothing in the references that “suggests the particular deposited plasmid of the present invention, or a specific deposited microorganism transformed with such, or a process using such.” Id. at 6.

We agree with appellants that there is nothing in the prior art of record that teaches or suggests the particular deposited plasmid as required by the claims that are the subject of this appeal, i.e., the pSM651 plasmid, having the deposit number CBS 203.94. While, as stated by the rejection set forth by the answer, the prior art may teach or suggest a plasmid containing genes for both the hydantoinase and carbamoylase activities under the control of a non-inducible promoter, the prior art does not teach or suggest a plasmid having the nucleotide sequence of the plasmid required by the products of claims 13, 14 and 15—the pSM651 plasmid. See, e.g., In re Deuel, 51 F.3d 1552, 1558-59, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995); In re Bell, 991 F.2d 781, 783-84, 26 USPQ2d 1529, 1532 (Fed. Cir. 1993). Because a plasmid having the nucleotide sequence of the pSM651 plasmid is not taught or suggested by the prior art, the

processes requiring the use of that plasmid are also novel and nonobvious. See In re Ochiai, 71 F.3d 1565, 1569-70, 37 USPQ2d 1127, 1131 (Fed. Cir. 1995).

It may be argued in support of the examiner's rejection that the limitation of a "microorganism transformed with the plasmid pSM651 CBS 203.94" should be read as a product-by-process limitation. If a product of a product-by-process limitation "is the same or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 996 (Fed. Cir. 1985). However, as discussed above, the product, in this case the microorganism transformed with the pSM651 plasmid, is different and nonobvious over the microorganisms of the prior art, as the transformed microorganism now contains a plasmid whose DNA sequence is not taught or suggested by the prior art.

Admittedly, during ex parte prosecution, claims are to be given their broadest reasonable interpretation consistent with the description of the invention in the specification. See In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). But giving the claims their broadest interpretation does not include reading a limitation required by the claims that are the subject of this appeal, i.e., the pSM651 plasmid, out of the claims. See Unique Concepts, Inc. V. Brown, 939 F.2d 1558, 1562, 19 USPQ2d 1500, 1504 (Fed. Cir. 1991) ("All the limitations of a claim must be considered meaningful . . ."). If appellants did not want to be limited to the use of the pSM651 plasmid, the plasmid could have been more broadly claimed.

REJECTION UNDER 37 C.F.R. § 1.196(b)

Claims 2 and 3 are rejected under 35 U.S.C. § 112, fourth paragraph, as they fail to further limit the process of claim 1.

The process of claim 1 is drawn to a process of producing D- $\alpha$ -amino acids, "wherein the conversion reaction is carried out in the presence of a microorganism transformed with the plasmid pSM651 CBS 203.94." Claims 2 and 3, however, require that the conversion reaction be carried out "in the presence of the enzymatic system isolated from the microorganism transformed with the plasmid pSM651 CBS 203.94." Claim 2. Claim 3 is dependent on claim 2.

The fourth paragraph of section 112 requires that:

a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

Claims 2 and 3 fail to further limit claim 1 because claim 1 requires that the conversion reaction be carried out in the presence of a microorganism transformed with the plasmid pSM651 CBS 203.9, whereas claim 2 and 3 do not contain that limitation, as they require that the conversion reaction take place in the presence of an enzyme system isolated from a microorganism transformed with the plasmid pSM651 CBS 203.9. Because claims 2 and 3 do not incorporate all of the limitations from the claim upon which they depend, they do not meet the requirements of 35 U.S.C. § 112, fourth paragraph.

OTHER MATTERS

Upon receipt of the application, the examiner should investigate whether the Bureau Voor Schimmelcultures, SK Baarn (Holland) is an acceptable

depository. See 37 CFR 1.803. Because all of the claims require the deposited pSM651 plasmid, deposit of that plasmid is required in order for the claims to meet the enablement requirement of 35 U.S.C. § 112, first paragraph.

### CONCLUSION

The prior art of record fails to teach or suggest processes for the production of D- $\alpha$ -amino acids using microorganisms transformed with the pSM651 plasmid, having the deposit number CBS 203.94, thus the rejections under 35 U.S.C. § 103(a) are reversed. In addition, Claims 2 and 3 are subject to a new ground of rejection under 35 U.S.C. § 112, fourth paragraph.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant(s), WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

No time period for taking any subsequent action in connection with this

appeal may be extended under 37 CFR § 1.136(a).

REVERSED; 37 C.F.R. § 1.196(b)

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|-----------------------------|---|-----------------|
| Sherman D. Winters          | ) |                 |
| Administrative Patent Judge | ) |                 |
|                             | ) |                 |
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|                             | ) | BOARD OF PATENT |
| Donald E. Adams             | ) |                 |
| Administrative Patent Judge | ) | APPEALS AND     |
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| Lora M. Green               | ) |                 |
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