

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

Ex parte IAN G. BRIDGES, DONALD GRIERSON  
and WOLFGANG W. SCHUCH

---

Appeal No. 1996-1027  
Application 08/162,288

---

ON BRIEF

---

Before WINTERS, WILLIAM F. SMITH, and LORIN, Administrative Patent Judges.

LORIN, Administrative Patent Judge.

DECISION ON APPEAL

In accordance with the Examiner's Answer (Paper No. 13, mailed November 1, 1995), this is an appeal under 35 U.S.C. § 134 from the final rejection of claims 4, 17-19 and 21-24, all the claims pending in the application. On consideration of the record, we reverse the examiner's decision rejecting these claims under 35 U.S.C. § 112 and 35 U.S.C. § 103.

Appeal No. 96-1027  
Application 08/162,288

We consider the issues in this appeal as they apply to claim 17, which is the only independent claim and therefore representative of the claims on appeal:

17. A process for modifying the production of a target gene product in a plant cell which comprises transforming the plant cell with a construct comprising a recombinant DNA sequence coding for only part of the target gene product wherein said target gene product is a fruit ripening enzyme.

The references relied upon by the examiner are:

|           |           |  |
|-----------|-----------|--|
| Jorgensen | 5,034,323 | July 23, 1989<br>(effective date 03/30/89) |
| Hiatt     | 4,801,540 | Jan. 31, 1989<br>(effective date 01/2/87)  |

Napoli et al., The Plant Cell, Vol. 2, pp. 279-89 (Apr. 1990)

van der Krol et al., The Plant Cell, Vol. 2, pp. 291-99 (Apr. 1990)

van der Krol et al., Plant Molecular Biology, Vol. 14, pp. 457-66 (1990)

van der Kroll, Ph.D. Thesis, University of Amsterdam, 14, September 1989

There are four rejections<sup>1</sup> (Examiner's Answer, pp. 3-7):

Claims 17 and 21-23 are rejected under 35 U.S.C. § 112, first paragraph, "as the disclosure is enabling only for claims limited to polygalacturonase and pectinesterase sequences derived from tomato."

Claims 4, 17-18, and 21-23 are rejected under 35 U.S.C. § 112, first paragraph, "as the disclosure is enabling only for claims limited to where the plant cell is tomato."

---

<sup>1</sup> There are currently three separate rejections under 35 U.S.C. § 112, first paragraph, and one rejection under 35 U.S.C. § 103. The Final Rejection (Paper No. 9) included a fourth rejection under 35 U.S.C. § 112, first paragraph. But this was subsequently withdrawn (Examiner's Answer, top p. 9). Accordingly, appellants' arguments (Brief, pp. 7-10) regarding that rejection are moot.

Appeal No. 96-1027  
Application 08/162,288

Claims 4, 17-19, and 21-23 are rejected under 35 U.S.C. § 112, first paragraph, "as the disclosure is enabling only for claims limited to the construct pJR16S."

Claims 4, 17-19, and 21-24 are rejected under 35 U.S.C. §103 as being unpatentable over "either of van der Krol (Ph.D. Thesis) or Jorgensen et al. taken with Hiatt et al."

### DISCUSSION

As set forth in the representative claim, the objective of the claimed invention is to modify the expression of a fruit ripening enzyme in a plant cell. In particular (Specification, pp. 1-2), the objective is to inhibit gene expression of the enzymes polygalacturonase and pectinesterase that cause a fruit's cell wall to change when it ripens. As indicated in a number of dependent claims, the invention is particularly directed to tomatos. The claimed invention accomplishes the fruit enzyme expression modification by transforming the plant cell with a DNA construct. The DNA construct comprises a recombinant DNA sequence coding for only a part of the fruit ripening enzyme.

#### Enablement

We first note that two of the three enablement rejections are internally inconsistent.

1) With regard to the first enablement rejection, which is directed only to claims 17 and 21-23, examiner argues (Examiner's Answer, p. 4) that the disclosure is enabling only for DNA constructs involving polygalacturonase and pectinesterase sequences derived from tomato. Claims 4 and 18 are not so limited. Therefore, to be consistent, the rejection

Appeal No. 96-1027  
Application 08/162,288

should have included claims 4 and 18. 2). With regard to the third enablement rejection, which is directed to claims 4, 17-19, and 21-23, examiner argues (Examiner's Answer, p. 4) that the disclosure is enabling only for construct pJR16S. That argument applies equally to claim 24; yet the rejection of claim 24 (Examiner's Answer, p. 5) has been withdrawn.

Secondly, in our assessment, the three enablement rejections are directed to different aspects of the same issue: whether the disclosure sufficiently teaches those of ordinary skill in the art how to make and use the inventive process as broadly as it is claimed without undue experimentation. Enablement rejection 1 focusses on the source of the claimed DNA construct involving polygalacturonase and pectinesterase sequences. Enablement rejection 2 focusses on the type of plant cells. Enablement rejection 3 focusses on the particular construct pJR16S, as well as the length of the recombinant DNA sequence. In each instance, the examiner argues that undue experimentation would be required for one skilled in the art to practice the invention as broadly as it is claimed. Accordingly, for purposes of discussion, we will treat the enablement rejections together.

The initial burden of providing reasons why a supporting disclosure does not enable the claims rests with the examiner. In re Marzocchi, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971). The examiner must establish that appellants have not provided sufficient disclosure, either through illustrative examples or terminology, for one skilled in the art to practice the invention as broadly as claimed without having to resort to undue experimentation. See In re Vaeck, 947 F.2d 488, 496, 20 USPQ2d 1438, 1445 (Fed. Cir.

Appeal No. 96-1027  
Application 08/162,288

1991). While some experimentation may be necessary, that does not preclude enablement; what is required is that the amount of experimentation "must not be unduly extensive." Atlas Powder Co. v. E.I. DuPont de Nemours & Co., 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984). Here, we can find no persuasive reasoning why the specification does not reasonably enable one skilled in the art to practice the invention as broadly as it is claimed and without undue experimentation. See In re Marzocchi, 439 F.2d 220 at 223-24, 169 USPQ at 369-70 (CCPA 1971).

Here, all we are provided is examiner's assertion that, except when employing DNA constructs involving polygalacturonase and pectinesterase sequences derived from tomato, tomato plant cells, pJR16S, and/or a recombinant DNA of a specified sequence segment length (although examiner does not say what that length should be), the claimed process is unpredictable and therefore, "[g]iven this unpredictability, the limited guidance presented in the specification, and the breadth of the claims, it is deemed that undue experimentation would be required of one skilled in the art to

practice the invention as so broadly claimed...." Examiner's Answer, p. 4. No fact finding has been done by the examiner to support this assertion.

It is true that unpredictability is a factor to be considered.

In unpredictable art areas, this court has refused to find broad generic claims enabled by specifications that demonstrate the enablement of only one or a few embodiments and do not demonstrate with reasonable specificity how to make and use other potential embodiments across the full scope of the claim.

Appeal No. 96-1027  
Application 08/162,288

PPG Indus., Inc. v. Guardian Indus. Corp., 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996). However, the burden rests initially with the examiner to substantiate the unpredictability of the art and that, given the unpredictability, the specification does not provide sufficient information to guide those of skill to make and use the claimed process across the full scope of the claims. Here a clear goal is disclosed; i.e, to inhibit the expression of fruit-ripening enzymes. Examples are provided which extensively describe the techniques necessary to make the recombinant DNA construct and thereafter to transfer the construct to the plant cell to be modified (specification, pp. 7-33). While the specification focusses on tomatos, there is no evidence that the process detailed therein for tomatos is not a sufficient guide for one of skill to apply the same techniques to the cells and constructs of other disclosed fruits (specification, p. 4, lines 24-27). Whatever unpredictability surrounds the use of constructs and cells other than tomato and pJR16S, or a recombinant DNA of different sequence segment lengths, the need for undue experimentation appears to be mitigated by appellants' clearly described examples of how to make and use the process. There is no evidence that would refute the statements made in the specification that the invention exemplified therein finds equal application in numerous other embodiments (specification, pp. 1-6). The lack of evidence of undue experimentation as to these other embodiments cannot be replaced by speculating about the possibility of producing an inoperative result. The examiner has not met the burden of providing evidence or reasoning sufficient to support a legal conclusion of lack of

Appeal No. 96-1027  
Application 08/162,288

enablement for the subject matter claimed. Accordingly, we reverse the three enablement rejections.

### Obviousness

Claims 4, 17-19, and 21-24 are rejected under 35 U.S.C. § 103 as being unpatentable over "either of van der Krol (Ph.D. thesis) or Jorgensen et al. taken with Hiatt et al."

Appellants challenge the propriety of the rejection on two grounds. First, appellants argue that they are entitled to the benefit of the filing date of the UK application (filed November 11, 1986) and as a result of that priority, the Jorgensen and van der Krol references are not references which can be properly applied against the claims. Second, appellants argue that a prima facie case of obviousness has not been established. Since, for the following reasons, we agree that a prima facie case of obviousness has not been established, we find it unnecessary to reach a decision on whether the Jorgensen and van der Krol references are proper prior art. For purposes of this appeal, we will assume arguendo that the references constitute legally available prior art.

The examiner (Examiner's Answer, p. 7) states that van der Krol and Jorgensen use "sense constructs to lower gene expression in plant cells." Appellants agree (Brief, p. 13). In this respect, these references are analogous. Hiatt, on the other hand, uses antisense constructs and therefore employs a wholly different process.

Jorgensen (column 3, lines 1-14), like the claimed method, discloses using partial

constructs whereas van der Krol and Hiatt, in contradistinction to the claims, use full length constructs.

Finally, only Hiatt uses DNA constructs to modulate fruit-ripening enzyme expression in plant cells. The parties have disagreed as to whether Jorgensen teaches DNA constructs encoding proteins to inhibit ripening-enzymes. However, considering that Jorgensen makes only a single mention of "ripening traits" as a trait, among many others, that potentially could be subject to the Jorgensen expression-reducing method (column 3, lines 53-57) and that the remaining disclosure is directed solely to affecting color changes in the plant, we agree with appellants that Jorgensen would not suggest to one of ordinary skill a more particular process by which a plant cell is transformed with a DNA construct coding for only a part of a fruit riping enzyme. There is no dispute that van der Krol does not teach or suggest modifying gene expression of fruit-ripening enzymes. Like Jorgensen, the van der Krol method is directed to flavonoid genes.

Accordingly, each reference teaches a part of the claimed invention. The claimed invention involves partial constructs and the modification of the expression of fruit-ripening enzymes. These two limitations are taught by Jorgensen and Hiatt, respectively. However, we fail to find any reason in the the references to modify Jorgensen's partial constructs to modify expression of fruit ripening enzymes as taught by Hiatt. In fact, given that Jorgensen employs sense constructs while Hiatt employs anti-sense constructs in practicing their respective methods, and that there is no disclosure equating the use of antisense

Appeal No. 96-1027  
Application 08/162,288

constructs with the use of sense constructs, we do not see that a basis has been formed for combining the references to reach the claimed process.

"To establish a prima facie case of obviousness based on a combination of references, there must be a teaching, suggestion or motivation in the prior art to make the specific combination that was made by the applicant." In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). While there is no doubt that each of the claimed limitations are taught by the cited references, the mere fact that the prior art could be modified to obtain the claimed process does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Something in the prior art as a whole must suggest the desirability and thus the obviousness of making the combination. Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). Here the examiner has not pointed to anything in the references which would lead one to the claimed combination and we can find none. The only reason for using the partial constructs of Jorgensen in a process like Hiatt's, to modify the expression of fruit-ripening enzymes in plant cells, is provided by appellants' disclosure. It is however impermissible, as examiner has done here, to use appellants' specification as a blueprint to reach the claimed invention from the prior art disclosures. "When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than hindsight gleaned

Appeal No. 96-1027  
Application 08/162,288

from the invention itself." Uniroyal, Inc. v. Rudkin-Wilet Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988). Accordingly, we hold that the examiner has not established a prima facie case of obviousness of the claims over the cited prior art.

REVERSED

SHERMAN D. WINTERS  
Administrative Patent Judge

WILLIAM F. SMITH  
Administrative Patent Judge

HUBERT C. LORIN  
Administrative Patent Judge

)  
)  
)  
)  
) BOARD OF PATENT  
) APPEALS AND  
)  
) INTERFERENCES  
)  
)

Cushman, Darby & Cushman  
1100 New York Avenue, N.W.  
Ninth Floor  
Washington, DC 20005-3918

Appeal No. 96-1027  
Application 08/162,288

HCL/cam