

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NATASHA V. RAIKHEL, WILLEM F. BROEKAERT,
NAM-HAI CHUA and ANIL KUSH

Appeal No. 94-2156
Application 07/888,366¹

ON BRIEF

Before WILLIAM F. SMITH, GRON, and WALTZ, Administrative
Patent Judges.

GRON, Administrative Patent Judge.

DECISION ON APPEAL UNDER 35 U.S.C. § 134

¹ Application for patent filed May 26, 1992. According to applicants, this application is a divisional of Application 07/587,071, filed September 24, 1990, now U.S. Patent 5,187,262, patented February 16, 1993.

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1. Introduction

This is an appeal from an examiner's rejections of Claims 3 and 4, all claims pending in this application. Claims 3 and 4 stand rejected under 35 U.S.C. § 103 over the combined teachings of Walujono et al. (Walujono), "Amino Acid Sequence of Hevein," Proceedings of the International Rubber Conference, Vol. 2, Rubber Research Institute Malaysia, Kuala Lumpur, pp. 518-531 (1975), Broekaert, "Chitinases and Chitin-Binding Lectins in Plants: A Biochemical and Physiological Study of Their Role in the Natural Protection of Plants Against Fungi," Dissertationes de Agricultura, Doctoraatsproefschrift Nr. 167 aan de Faculteit der Landbouwwetenschappen van de K. U. Leuven, pp. II-IV (Abs.) and 73-84 (Ch. 7)(September 1988), and Weissman et al. (Weissman), U.S. 4,394,443, patented July 19, 1983.² Claim 3

² As evidence in support of this rejection, the examiner cites the following references (Examiner's Answer (Ans.), pp. 3-4):

Alberts, B., et al., Molecular Biology of the Cell, Garland Publishing, Inc., N.Y., pp. 185-196 (1983);

Safford et al., "Plastid-Localised Seed Acyl-Carrier Protein of *Brassica napus* is Encoded by a Distinct, Nuclear Multigene Family," Eur. J. Biochem., Vol. 174, pp. 287-295 (1988);

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stands rejected under 35 U.S.C. § 102(f) based on the authorship of later-published Broekaert et al. (Lee I), "Wound-Induced Accumulation of mRNA Containing a Hevein Sequence in Laticifers of Rubber Tree (*Hevea brasiliensis*)," Proc. Natl. Acad. Sci. USA, Vol. 87, pp. 7633-7637 (October 1990), and Lee et al. (Lee II), "Co- and Post-Translational Processing of the Hevein Preproprotein of Latex of the Rubber Tree (*Hevea brasiliensis*), J. Biol. Chem., Vol. 266, No. 24, pp. 15944-15948 (August 25, 1991). Claim 4 stands rejected under 35 U.S.C. § 103 as being unpatentable in view of the subject matter appellants claim

Back et al., "Isolation of cDNA Clones Coding for Spinach Nitrite Reductase: Complete Sequence and Nitrate Induction," Mol. Gen. Genet., Vol. 212, pp. 20-26 (1988);

Van der Plas et al., "The Gene for the Precursor of Plastocyanin from the Cyanobacterium *Anabaena* sp. PCC 7937: Isolation, Sequence and Regulation," Mol. Microbiol., Vol. 3, No. 3, pp. 275-284 (1989).

While appellants have not objected to the examiner's citation of "other" references in support of the rejection under section 103, we are mindful of the following statement in In re Hoch, 428 F.2d 1341, 1342 n. 3, 166 USPQ 406, 407 n. 3 (CCPA 1970):

Where a reference is relied on to support a rejection, whether or not in a "minor capacity," there would appear to be no excuse for not positively including the reference in the statement of the rejection.

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which is prior art under 35 U.S.C. § 102(f) as evidenced by the co-authorship of Lee I and/or Lee II. Claims 3 and 4 read:

3. A cDNA molecule, HEV1, free of other DNA molecules naturally occurring with the DNA molecule, corresponding to the DNA sequence of Figure 2 as carried in E. coli ATCC 68363 which encodes a protein.

4. A single strand cDNA molecule, HEV1, free of other DNA molecules naturally occurring with the DNA molecule, which encodes a protein corresponding to the 204 amino acid sequence in Figure 2.

2. Discussion

A. Obviousness in view of Walujono, Broekaert & Weissman

As viewed by the examiner, the issue on appeal is whether HEV1, which corresponds to the cDNA sequence of Figure 2 and the cDNA sequence which encodes the protein corresponding to the 204 amino acid sequence in Figure 2, would have been obvious to a person having ordinary skill in the art in view of (1) prior art teaching of the 43 amino acid sequence for mature hevein, including an internal Trp-Gly-Trp-Cys sequence (Walujono, p. 519), (2) recognition in the art that hevein has antifungal

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properties and may be useful for treating human beings infected by fungus (Broekaert), and (3) Weissman's description of the requisite information and means necessary to enable persons skilled in the art to successfully probe a DNA library for and isolate cDNA which encodes a target protein without undue experimentation. On the other hand, appellants stress the significant differences between cDNA which encodes mature hevein with a 43 amino acid sequence which is known in the art and the claimed cDNA, HEV1, which encodes the novel hevein precursor with the 204 amino acid sequence depicted in Figure 2. Appellants argue that the combined teachings of Walujono, Broekaert, and Weissman would not have motivated a person having ordinary skill in the art to probe for and isolate cDNA which encodes the previously unknown 204 amino acid hevein precursor depicted in Figure 2. Appellants emphasize that they are claiming cDNA which encodes a novel 204 amino acid hevein precursor (see the claims issued in Raikhel et al., U.S. 5,187,262, which issued from parent Application 07/587,071), not cDNA which encodes the 43 amino acid sequence of mature hevein. We find that the differences between the structures of cDNA which encodes mature hevein and cDNA which

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encodes the 204 amino acid hevein precursor strongly support the patentability of the subject matter claimed in this case. Accordingly, we reverse the examiner's rejection of Claims 3 and 4 under 35 U.S.C. § 103 in view of the combined teachings of Walujono, Broekaert, and Weissman.

In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) instructs:

The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art. . . . Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure.

At 473, 5 USPQ2d at 1532, the court explains:

There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure.

Here, as in Dow Chemical Co., 837 F.2d at 473, 5 USPQ2d at 1532, "[o]f the many scientific publications cited . . . none suggests that any process could be used successfully . . . to produce this product having the desired properties."

The prior art cited in this case reasonably brings the claimed subject matter to no higher than the "obvious-to-try"

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level. See In re Eli Lilly & Co., 902 F.2d 943, 945, 14

USPQ2d 1741, 1743 (Fed. Cir. 1990):

An "obvious-to-try" situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to obtain the desired

result, or that the claimed result would be obtained if certain directions were pursued. See generally In re O'Farrell, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988)(defining obvious-to-try as when prior art gives

"only general guidance as to the particular form of the claimed invention or how to achieve it").

Here, the prior art provides no information whatsoever as to the "particular form of the claimed invention or how to achieve it." Id. Moreover, In re O'Farrell confirms at 903, 7 USPQ2d at 1681, that the evidence the examiner relies upon in this case presents a classic "obvious-to-try" situation which is not the standard for unpatentability under 35 U.S.C. § 103:

[W]hat would have been "obvious to try" would have been to . . . try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave . . . no direction as to which of many possible choices is likely to be successful.

Compare the examiner's responses (Examiner's Answer (Ans.)),

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pp. 8-13) to appellants' argument that the prior art presents persons having ordinary skill in the art with no more than an invitation to experiment, an argument that refers to In re Bell,

991 F.2d 781, 26 USPQ2d 1529 (Fed. Cir. 1993), especially the court's discussion of Weissman's method of probing for and isolating cDNA encoding proteins with known amino acid sequences and the relevance of methods of isolating cDNA using probes based on the amino acid structure of the protein it encodes to the patentability of claims drawn to the cDNA itself.³ For example, the examiner emphasizes that HEV1 has

³ Neither the examiner nor appellants have addressed or considered the more recent holdings and opinions in In re Deuel, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995) and Ex parte Goldgaber, 41 USPQ2d 1172 (Bd. Pat. App. & Int. 1995). Moreover, resolution of the issues in this case does not necessitate our consideration of the holdings and opinions in those cases relative to In re Bell, supra, with in depth comparison of the underlying facts in this case to the facts therein. It should suffice to say that the decision in this case is dictated by the fact unique to this case that the claimed cDNA, HEV1, encodes a sequence of 204 amino acids, not the 43 amino acid sequence the prior art discloses. See In re Ochiai, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995) (Obviousness determinations require a fact-specific analysis of the claims and prior art. *Per se* rules of obviousness are legally incorrect.)

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the same -Trp-Gly-Trp-Cys- internal sequence (Trp has a unique codon) as the known 43 amino acid sequence of mature hevein (Ans., pp. 9-11), yet the fact that appellants' claims are drawn to cDNA which encodes a novel 204 amino acid precursor is not considered to be a material distinction. We disagree.

The examiner states (Ans., pp. 11-13, bridging para. (3)):

While applicants urge that the actual gene expression product and encoding cDNA sequence are larger than the known hevein protein having only 43 amino acids, one of ordinary skill in the art in carrying out the method of Weissman . . . would have inherently or inevitably obtained the full-length cDNA sequence corresponding to the gene encoding the protein which included these 43 amino acids

In our view, the examiner erroneously equates the requisite "likelihood of success" to inevitability. Rather, for obviousness under 35 U.S.C. § 103, persons having ordinary skill in the art would have had to have a reasonable expectation of success in view of the cited prior art. See In re O'Farrell,

853 F.2d at 904, 7 USPQ2d at 1681 ("For obviousness under § 103, all that is required is a reasonable expectation of success.")

The examiner predicts (Ans., p. 12, l. 12-17):

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Thus, one of ordinary skill in the art would have kept probing until encountering the intact terminator (i.e., including polyadenylation signal) and such a sequence would have inherently encoded the rest of the naturally encoded previously unknown polypeptide portion C-terminal to the N-terminal 43 amino acid sequence which was known.

In our view, rather than expect to isolate cDNA which encodes a 204 amino acid hevein preprotein, persons having ordinary skill in the art would keep searching until they inevitably would find cDNA which encodes something quite new and different.⁴ This is not obviousness within the meaning of 35 U.S.C. § 103. This is surprise which is indicative of patentability.

B. Rejections under 35 U.S.C. § 102(f) and § 103

But for the fact that the claimed subject matter in In re Katz, 687 F.2d 450, 215 USPQ 14 (CCPA 1982), was rejected under 35 U.S.C. § 102(g) over prior publications whose authorship included a student not named as a coinventor of the subject matter claimed in the patent application and the

⁴ We note here that U.S. Patent 5,187,262, which issued from parent Application 07/587,071, claims "[a] protein . . . consisting of the sequence of 204 amino acids shown in Fig. 2 and subfragments of said sequence larger than the 43 amino acid hevein sequence which includes the hevein sequence and which binds chitin." We wonder how the same examiner can reasonably suggest that cDNA which encodes a patentable protein would have been obvious over the same prior art over which the protein was allowed.

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claims in this application stand rejected under 35 U.S.C. § 102(f) over subsequent publications whose authorship includes a student, Lee, not named as a coinventor of the subject matter claimed in this patent application, the evidence in the two cases is virtually identical. This case similarly contains a Declaration Under 37 CFR 1.132 (attachment to appellants' Supplemental Brief Under 37 CFR 1.193(b)) by a coinventor, Natasha V. Raikhel, which states in paragraph (1) thereof that "Dr. Lee's contribution was as a student at Michigan State University and he performed routine experimentation under her supervision."

That the holding in Katz applies to rejections under 35 U.S.C. § 102(f) is evident from Ex parte Kroger, 219 USPQ 370 (Bd. Pat. App. & Int. 1982). In the case before the Board "various declarations were submitted by Kroger and Rod to the effect that Kroger and Rod are the inventors and that Knaster merely carried out assignments and worked under the supervision and direction of Kroger." Id. at 371. The Board stated at 371-72:

If this were all the evidence in the case, then we would be constrained to agree that Kroger et al are the inventors and that Knaster is not a coinventor.

The difference in Kroger was that the record included

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additional evidence which showed that (1) Knaster refused to sign a declaration that he was not a coinventor, and (2) Knaster wrote a letter to the PTO declaring himself to be a coinventor of the invention claimed.

In this case, we have only an examiner's speculation that Lee must be a coinventor of the subject matter claimed in this application because of the repeated use of the pronoun "we" in the later published papers which Lee co-authored and coinventor Raikhel's reference to "Dr. Lee" in her declaration (Supplemental Examiner's Answer, pp. 2-4). However, the examiner may recall that the PTO was expressly cautioned against just this type of speculation in In re Katz, 687 F.2d at 455-56, 215 USPQ at 18 (emphasis added):

[W]e hold that authorship of an article by itself does not raise a *presumption* of inventorship with respect to the subject matter disclosed in the article. Thus, co-authors may not be *presumed* to be coinventors merely from the fact of co-authorship. . . .

. . . [When there was] ambiguity created by the printed publication . . . [i]t was incumbent, therefore, on appellant to provide a satisfactory showing which would lead to a reasonable conclusion that he is the sole inventor.

.

In the declaration, appellant provides the explanation that the co-authors of the publication . . . "were students working under the direction and supervision of the inventor" This statement . . . provides a clear alternative conclusion On the record here, the board should not have engaged in further speculation as to whether appellant's view was shared by . . . [the] co-authors but rather should have accepted that . . . [the co-authors] were acting in the capacity indicated, that is, students working *under the direction and supervision of appellant.* From such a relationship, joint inventorship cannot be inferred in the face of sworn statements to the contrary.

In light of Raikhel's declaration, the examiner erred as a matter of law in presuming that the co-authorship of the Lee I and Lee II publications raises the presumption that Lee is a coinventor of the subject matter appellants claimed. Accordingly, we reverse the examiner's rejections of Claim 3 under 35 U.S.C. § 102(f) and Claim 4 under 35 U.S.C. § 103 in view of subject matter the examiner deemed to be prior art under 35 U.S.C. § 102(f).

3. Other Issues

Although the court in In re Deuel, 51 F.3d at 1560, 34 USPQ2d at 1216, reversed the examiner's rejection of claims

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drawn to DNA and cDNA molecules which encode a protein in view of prior art teaching of the complete amino acid sequence of the target protein and known methods of probing DNA libraries with DNA segments corresponding to unique amino acid sequences including amino acids having unique codons and isolating DNA and cDNA, the court left one matter for the PTO to consider.

The matter was expressed as follows (id.):

Because Deuel's patent application does not describe how to obtain any DNA except the disclosed cDNA molecules, [the] claims . . . may be considered to be inadequately supported by the disclosure of the application.

Like the court in Deuel at 1560, 34 USPQ2d at 1216, we will not address whether Claim 4 presently on appeal satisfies the enablement requirement of § 112, first paragraph, but will leave to the examiner whether any further rejection is appropriate.

4. Conclusion

We reverse the examiner's rejection of Claims 3 and 4 under 35 U.S.C. § 103 over the combined teachings of Walujono, Broekaert, and Weissman.

We reverse the examiner's rejection of Claim 3 under

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35 U.S.C. § 102(f).

We reverse the examiner's rejection of Claim 4 under
35 U.S.C. § 103 in view of prior art under 35 U.S.C. § 102(f).

We remand this application to the examiner to consider
the Other Issues raised in paragraph 4 of this decision.

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This application, by virtue of its "special" status, requires an immediate action. Manual of Patent Examining Procedures § 708.01(d)(6th ed., rev. 3, July 1997). It is important that the Board be informed promptly of any action affecting the appeal in this case.

REVERSED and REMANDED

	William F. Smith)	
	Administrative Patent Judge)	
)	
)	
)	
	Teddy S. Gron)	BOARD OF
PATENT)	
	Administrative Patent Judge)	APPEALS AND
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