

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GARY E. HARMAN,
ROXANNE M. BROADWAY,
ARNE TRONSMO,
MATTEO LORITO,
CHRISTOPHER K. HAYES, and
ANTONIO Di PIETRO

Appeal No. 1996-0657
Application 07/919,784

ON BRIEF

Before WINTERS, SPIEGEL, and MILLS, Administrative Patent Judges,

WINTERS, Administrative Patent Judge.

DECISION ON APPEAL

This appeal was taken from the examiner's decision rejecting claims 5, 6, 8, 12, and 13. Claims 1 through 4, 7, 9, 14, and 15, which are the only other claims remaining in the application, stand allowed.

Representative Claims

Claims 5 and 8, which are illustrative of the subject matter on appeal, read as follows:

5. A biologically pure chitin-containing-fungus-inhibiting composition containing (a) endochitinase which is coded for by a gene in the genome of a fungus and (b) protein which causes release of chromogenic p-nitrophenol from p-nitrophenyl- β -D-N,N'-diacetylchitobiose but not from p-nitrophenyl-N-acetyl- β -D-glucosaminide and which is coded for by a gene in the genome of a fungus, in a weight ratio of (a):(b) ranging from 3:1 to 1:1.2.

8. A method of inhibiting the germination or replication of a chitin-containing fungus of a genus selected from the group consisting of Botrytis, Fusarium, Saccharomyces, Trichoderma, Uncinula, and Ustilago, which comprises contacting such fungus with an antifungal effective amount of the composition of claim 5.

The References

There appears to be some confusion on this record respecting what references the examiner relies on in rejecting appellants' claims. In the Examiner's Answer mailed September 27, 1995 (Paper No. 30), Section (7) the examiner lists the following "prior art of record relied upon in the rejection of claims under appeal:"

A. Ôtakara (Ôtakara (I)), "Studies on the Chitinolytic Enzymes of Black-koji Mold," Agric. Biol. Chem., Vol. 27, No. 6, pp. 454-460 (1963)

A. Ohtakara et al. , "Isolation of Chitinase and Chitobiase Produced by Pycnoporus cinnabarinus and Their Properties," Chemical Abstracts, Vol. 95:348, Abstract No. 75979W, August 1981

M. Yabuki, "Chitinase and a Method for Its Production," Derwent Biotechnol. Abstracts, Vol. 4, No. 15, Abstract No. 85-07729 (July 1985)

A. Ohtakara (Ohtakara (II)), "Chitinase and β -N-Acetylhexosaminidase From Pycnoporus cinnabarinus," Meth. Enzymol., Vol. 161, pp. 462-470 (1988)

A. Arroyo-Begovich, "Chitinase from Neurospora crassa," Meth. Enzymol., Vol. 161, pp. 471-474 (1988)

Takara Biomedicals Brochure of Chitinase T-1 (Takara), April 1989

G.W. Gooday, "Physiology of Microbial Degradation of Chitin and Chitosan," Biodegradation , Vol. 1, No. 2--3, pp. 177-190 (1990)

P.J. Kuhn et al. (Kuhn), (eds.), Biochemistry of Cell Walls and Membranes in Fungi, Chapter 6, pp. 81-95 (Springer-Verlag, Berlin, 1990)

M. Pedraza-Reyes et al. (Pedraza-Reyes (I)), "Chitinase Activity in Germinating Cells of Mucor rouxii," Antonie Van Leeuwenhoek, Vol. 59, No. 3, pp. 183-189 (1991)

M. Pedraza-Reyes et al. (Pedraza-Reyes(II)), Detection of Nine Chitinase Species in Germinating Cells of Mucor rouxii," Cur. Microbiol., Vol. 22, No. 1, pp. 43-46 (January 1991)

The above-listed references are included in the statement of rejection of claims 5, 6, 8, 12, and 13 under 35 U.S.C. § 103 (Examiner's Answer, Paper No. 30, Section (9)).

However, the examiner cites other references not included in the statement of rejection. In the Examiner's Answer, Paper No. 30, Section (8), the examiner lists the following "[r]eferences which have been newly cited in this Examiner's Answer:"

P. Singleton et al. (Singleton), Dictionary of Microbiology and Molecular Biology,

(John Wiley & Sons, Chichester, 1987)

C.J. Ridout et al. (Ridout), "Fractionation of Extracellular Enzymes from a Mycoparasitic Strain of Trichoderma harzianum," Enzyme Microb. Technol., Vol. 10, pp. 180-187 (March 1988)

M. Chérif et al. (Chérif), "Cytochemical Aspects of Chitin Breakdown During the Parasitic Action of a Trichoderma sp. on Fusarium oxysporum f. sp. radicis-lycopersici," Phytopathology, Vol. 80, No. 12, pp. 1406-1414 (1990)

C.J. Ulhoa et al. (Ulhoa), "Purification and Some Properties of the Extracellular Chitinase Produced by Trichoderma harzianum," Enzyme Microb. Technol., Vol. 14, pp. 236-240 (March 1992)

These references are not included in the statement of rejection under 35 U.S.C. § 103. According to the examiner, "these references were cited only to provide support for the examiner's contention of what was known and accepted in the art and not within a new grounds of rejection or new point of argument" (Examiner's Answer, Paper No. 30, Section (8)). The examiner argues that Singleton discloses the "art-accepted" structure and functions of the fungal cell wall (Examiner's Answer, page 10). The examiner mentions Chérif, Ridout, and Uhola in arguing that appellants' rebuttal evidence in the specification and in the Harman declaration filed January 26, 1994, is not commensurate in scope with the appealed claims (Examiner's Answer, page 14, line 22).

Another reference "pops up" in the Examiner's Answer, Paper No. 30, page 7, line 10. This is Suslow et al. (Suslow), U.S. Patent No. 4,940,840 issued July 10, 1990. According to the examiner, Suslow discloses that "several bacterial and

plant endochitinases have been clearly shown to have anti-fungal activity and utility as fungal biocontrol agents.” Suslow is not included in the listing of “prior art of record relied upon in the rejection of claims under appeal” in Section (7) of the Examiner’s Answer; nor in the listing of “references which have been newly cited in this Examiner’s Answer” in Section (8) of the Examiner’s Answer; nor is Suslow included in the statement of rejection set forth in Section (9) of the Examiner’s Answer.

At this juncture, we think it appropriate to remind the examiner that references relied on to support a rejection under 35 U.S.C. § 103 should be included in the statement of rejection. As stated 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. Where, as here, the examiner lists ten references “relied upon in the rejection of claims under appeal” and includes those references, and only those references, in the statement of rejection under 35 U.S.C. § 103, we have limited our review of the prima facie case of obviousness to those references. We shall not discuss the other references, referred to in the Examiner’s Answer, further.

The Issue

The issue presented for review is whether the examiner erred in rejecting

claims 5, 6, 8, 12, and 13 under 35 U.S.C. § 103 as unpatentable over any of Takara, Ohtakara et al., Ôtakara (I) or Yabuki, taken in view of Gooday and Kuhn, and any one of Pedraza-Reyes (I), Pedraza-Reyes (II), Ohtakara (II) or Arroyo-Begovich.

Deliberations

Our deliberations in this matter have included evaluation and review of the following materials:

(I) The instant specification, including Figures 1 through 8, and all of the claims on appeal;

(II) The main Brief (Paper No. 29), Reply Brief (Paper No. 32), and “Reply to Supplemental Examiner’s Answer” (Paper No. 34);

(III) The Examiner’s Answer (Paper No. 30), the First Supplemental Examiner’s Answer (Paper No. 33), and the Second Supplemental Examiner’s Answer (Paper No. 39);

(IV) The Harman declaration filed under the provisions of 37 CFR § 1.132, executed December 23, 1993; and

(V) The prior art references cited in Section (7) of the Examiner’s Answer (Paper No. 30), and applied in the statement of rejection in Section (9) of the Examiner’s Answer.

On consideration of the record, including the above-listed materials, we

reverse the rejection of claims 5, 6, 8, 12, and 13 under 35 U.S.C. § 103.

Discussion

Independent claim 5 recites a “biologically pure” anti-fungal composition containing (a) endochitinase coded for by a gene in the genome of a fungus; and (b) a specified exochitinase, hereinafter referred to as chitobiosidase, also coded for by a gene in the genome of a fungus and defined in terms of the assay described in appellants’ specification (page 7, lines 5 through 22). As explained in the specification, endochitinase cleaves glycosidic linkages randomly along the polysaccharride chain of chitin; chitobiosidase cleaves dimeric units from one end of chitin. Claim 5 recites the weight ratio of (a):(b) ranging from 3:1 to 1:1.2.

Dependent claims 6, 12, and 13 also recite compositions. These claims further limit the weight ratio or source material of components (a) and (b). Claim 8 recites a method of inhibiting the germination or replication of a chitin-containing fungus of a genus selected from the group consisting of Botrytis, Fusarium, Saccharomyces, Trichoderma, Uncinula, and Ustilago, by contacting such fungus with an antifungal effective amount of the composition of claim 5.

The examiner argues that a first set of references (Takara, Ohtakara et al., Ôtakara (I), and Yabuki) disclose endochitinase from a fungal source; that a second set of references (Pedraza-Reyes (I), Pedraza-Reyes (II), Ohtakara (II), and Arroyo-Begovich) disclose chitobiosidase from a fungal source; and that it would have

been prima facie obvious to combine the known endochitinase and chitobiosidase in a weight ratio ranging from 3:1 to 1:1.2 in light of the combined disclosures of references relied upon, including Gooday and Kuhn. We disagree.

We have no doubt that the prior art could be modified in the manner proposed by the examiner to arrive at appellants' composition and method. This can be seen from a review of the instant specification and claims. Merely because the prior art could be so modified, however, would not have made 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). That is not the case here.

This is not a case of using components in combination for anti-fungal activity, each component having been used individually in the prior art for anti-fungal activity. Cf. In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (Prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose). The examiner has not established that the first set of references teach that endochitinase from a fungal source has anti-fungal activity. Nor has the examiner established that the second set of references teach that chitobiosidase from a fungal source has anti-fungal activity.

According to the examiner, "Gooday teaches that the degradation of chitin in the cell walls of fungi is an important method of the biocontrol of fungi" (Examiner's

Answer, Paper No. 30, page 5, third full paragraph). However, that considerably overstates the relevant disclosure in Gooday, stating that

As most fungal and invertebrate pests and pathogens have chitin as an essential structural component (Gooday 1990d), chitinase activity could have an important place in the repertoire of mechanisms for biological control. Thus the strongly chitinolytic fungus Trichoderma harzianum has good potential for the control of a range of soil-borne plant pathogens (Lynch 1987; Sivan & Chet 1989). [Gooday, page 185, under the heading “Uses of chitinolytic organisms in biocontrol”].

The Gooday reference does not contain the teaching attributed to it by the examiner. Gooday discloses that “chitinase activity could have an important place in the repertoire of mechanisms for biological control;” and that “the strongly chitinolytic fungus Trichoderma harzianum has good potential for the control of a range of soil-borne plant pathogens (emphasis added).” The examiner, however, characterizes Gooday as teaching what it does not, namely, “that the degradation of chitin in the cell walls of fungi is an important method of the biocontrol of fungi.” Further, this record does not reflect that the examiner considered the source material referenced in the above-quoted passage in Gooday namely, Lynch 1987¹ or Sivan & Chet 1989.² That source material is not part of the prior art relied on in rejecting the claims on appeal, and is not included in the statement of rejection under 35 U.S.C. § 103.

¹ Lynch, “In vitro identification of Trichoderma harzianum as a potential antagonist of plant pathogens,” Curr Microbiol, Vol. 16, pages 49-53 (1987)

² Sivan et al. (Sivan), “Degradation of fungal cell walls by lytic enzymes of Trichoderma harzianum,” J. Gen Microbial, Vol. 135, pages 675-682 (1989)

We disagree that Goodday supports a conclusion that it would have been prima facie obvious to combine the known endochitinase and chitobiosidase in a weight ratio ranging from 3:1 to 1:1.2 to form a “biologically pure” anti-fungal composition. Nor does any disclosure in Kuhn which we can find, or which the examiner relies on, including Fig. 1A-E, cure the deficiencies of Goodday.

The Examiner’s Answer, in large part, constitutes an ex post facto effort to explain why appellants’ combination of endochitinase and chitobiosidase gives rise to superior anti-fungal activity. In our judgment, however, the applied prior art does not constitute an adequate evidentiary foundation to support a conclusion of obviousness of appellants’ claimed composition and method at the time the invention was made.

For these reasons, we conclude that the examiner has not established a prima facie case of obviousness of claims 5, 6, 8, 12, and 13 and, accordingly, the rejection of those claims under 35 U.S.C. § 103 is reversed. We find it unnecessary to discuss the rebuttal evidence in appellants’ specification, and in the Harman declaration under 37 CFR § 1.132, executed December 23, 1993, relied on to rebut any such prima facie case.

The examiner’s decision is reversed.

REVERSED

