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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte JOHN C. KLOCK, JR.

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Appeal No. 95-4342
Application 07/938,832[1]

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HEARD: July 14, 1999

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

WILLIAM F. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 3 through 7, 14 through 16, 18 and 23 through 32, all the claims remaining in the application.

[1] Application for patent filed August 31, 1992. According to appellant, this application is a continuation-in-part of Application 07/753,196, filed August 30, 1991.

Claims 23 and 15 are illustrative of the subject matter on appeal and read as follows:

15. A kit for performing monosaccharide linkage structural analysis of carbohydrates, said kit comprising, a carbohydrate derivatizing agent, a glycosidic bond hydrolyzing agent and a fluorophore label.

23. A method of analyzing structural relationships between monosaccharides of a carbohydrate comprising:

a) derivatizing a carbohydrate with a carbohydrate derivatizing agent which covalently binds to the free functional groups of the carbohydrates to form a derivatized carbohydrate;

b) converting said derivatized carbohydrate into derivatized monosaccharides by breaking the glycosidic bonds of said derivatized carbohydrate;

c) forming labeled derivatized monosaccharides by reacting said derivatized monosaccharides with a fluorescence labelling compound;

d) separating said labeled derivatized monosaccharides by electrophoresis; and

e) identifying said labeled derivatized monosaccharides by comparing the electrophoresis mobility of said labeled derivatized monosaccharides to a monosaccharide standard, said monosaccharide standard comprising mono-saccharides derivatized with said carbohydrate derivatizing agent and labeled with said fluorescence labelling compound.

The references relied upon by the examiner are:

Lindberg, “Methylation Analysis of “Complex Carbohydrates: General Procedure and Application for Sequence Analysis”, Methods in Enzymology, Vol. 50, pp. 3-33 (1978).

Levery, “Microscale Methylation Anaysis of Glycolipids Using Capillary Gas Chromatography -- Chemical Ionization Mass Fragmentography with Selected Ion Monitoring,” Methods in Enzymology, Vol. 138, Part E. pp. 13-25 (1987).

Jackson, “The use of polyacrylamide-gel electrophoresis for the high-resolution separation of reducing saccharides labelled with the fluorophore 8-aminonaphthalene-1, 3,6-trisulphonic acid,” Biochemistry Journal, Vol. 270, pp. 705-713 (1990).

Jackson, “Polyacrylamide Gel Electrophoresis of Reducing Saccharides Labeled with th e Fluorophore 2-Aminoacridone: Subpicomolar Detection Using an Imaging System Based on a Cooled Charge-Coupled Device,” Analytical Biochemistry, Vol. 196, pp. 238-244 (1991).

Jackson (PCT Applicatioin) WO 91/05256 Apr. 18, 1991

Claims 3 through 7, 14 through 16, 18 and 23 through 32 stand rejected under 35 U.S.C. § 112, first paragraph, as being non-enabled. Claims 3 through 7, 14 through 16, 18 and 23 through 32 also stand rejected under 35 U.S.C. § 103 as unpatentable over the three Jackson references listed above in combination with Lindberg or Levery. We reverse both of these rejections. In addition, we raise an issue for the examiner’s consideration upon return of the application to the examining group.

DISCUSSION

Enablement

The examiner maintains that the specification, while providing a method of determining the identities and linkage sites of a carbohydrate’s constituent monosaccharides, is not enabling for determining the “entirety of the structure” of a complex carbohydrate. All of the claims have been rejected on this basis. See the Answer, page 5. Having considered the positions of appellant and the examiner, we are in agreement with appellant that the examiner has failed to establish that the phrase

"analyzing structural relationships between monosaccharides of a carbohydrate," as it appears throughout the specification and in independent claim 23, would be "understood in the field of carbohydrate chemistry to mean an analysis establishing the *complete* structure of a carbohydrate." The appellant's use of the phrase in the specification and claims appears to be entirely consistent with its use in the prior art. See the Brief, page 6.

To the extent that the examiner argues that the claims encompass inoperative embodiments, we are not persuaded. First, the examiner's conclusion is based on an interpretation of "analyzing structural relationships" which is not justified by the record. Second, as set forth in Atlas Powder Co. v. E.I. Du Pont De Nemours & Co., 750 F.2d 1569, 1576-77, 224 USPQ 409, 414 (Fed. Cir. 1984):

> Even if some of the claimed combinations were inoperative, the claims are not necessarily invalid. "It is not a function of the claims to specifically exclude . . . possible inoperative substances . . . . In re Dinh-Nguyen, 492 F.2d 856, 859-59, 181 USPQ 46, 48 (CCPA 1974) (emphasis omitted). Accord, In re Geerdes, 491 F.2d 1260, 1265, 180 USPQ 789, 793 (CCPA 1974); In re Anderson, 471 F.2d 1237, 1242, 176 USPQ 331, 334-35 (CCPA 1971). Of course, if the number of inoperative combinations becomes significant, and in effect forces one of ordinary skill in the art to experiment unduly in order to practice the claimed invention, the claims might indeed be invalid. See, e.g., In re Cook, 439 F.2d 730, 735, 169 USPQ 298, 302 (CCPA 1971).

The examiner has not performed the fact finding needed in order to properly reach a conclusion of "undue experimentation."

Accordingly, we reverse the rejection of claims 3 through 7, 14 through 16,

18 and 23 through 32 under 35 U.S.C. § 112, first paragraph.

Obviousness

Claims 3 through 7, 14 and 23 through 32 are directed to analysis of the structural relationships between monosaccharides of a carbohydrate; claims 15, 16 and 18 are directed to kits for performing the analysis. In its broadest aspect, the method comprises derivatizing a carbohydrate with an agent which covalently binds to the free functional groups of the carbohydrate; breaking the glycosidic bonds of the derivatized carbohydrate to convert it to derivatized monosaccharides; labeling the derivatized monosaccharides with a fluorescent label; separating the fluorescent, derivatized monosaccharides electrophoretically; and identifying the separated monosaccharides by comparing their electrophoretic mobility with standards labeled and derivatized in the same manner. See independent claim 23.

Lindberg discloses structural analysis of a carbohydrate through methylation of the free hydroxyl groups on the carbohydrate, hydrolysis of the methylated carbohydrate into its constituent monosaccharides, and separation and characterization of the monosaccharides by gas-liquid chromatography and mass spectrometry. Lindberg's methylation and hydrolysis steps correspond to the derivatization and degradation steps of the present method. Levery's disclosure is equivalent to Lindberg's.

The three Jackson references describe structural analysis of carbohydrates based upon electrophoretic separation of fluorescently labeled reducing saccharides and

comparison to labeled standards. This method corresponds roughly to the labeling, separating and identifying steps of the present method.

According to the examiner, "[i]t would have been obvious to the worker of ordinary skill in the art . . . having the above mentioned references before him to select the methylated carbohydrates as the monosaccharide derivatives in the electrophoretic separation thereof, to determine the structural relationships of such monosaccharides since Jackson teaches the advantages of the highly sensitive electrophoretic separation, and each of Levery and Lindberg teach the specific advantages of employing methylated monosaccharides in such methods." See the Answer, the paragraph bridging pages 7 and 8.

If we understand the examiner's position correctly, it is that it would have been obvious to arrive at the present invention by combining the derivatizing and hydrolyzing steps of Levery's or Lindberg's method with the labeling, separating and identifying steps of Jackson's method. The examiner's proposed reason or suggestion for combining the references seems to be simply that both methods have advantages.[2]

We have no doubt that the prior art could be modified in a manner consistent with appellant's specification and claims. The fact that the prior art could be so modified,

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[2] As stated in Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996) (citation omitted), "It is well-established that before a conclusion of obviousness may be made based on a combination of references, there must have been a reason, suggestion or motivation to lead an inventor to combine those references."

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). Here, we find no reason stemming from the prior art which would have led a person having ordinary skill to the claimed method. In our judgment, the only reason or suggestion to combine the references in the manner proposed by the examiner comes from appellant's specification. The rejection of claims 3 through 7, 14 through 16, 18 and 23 through 32 under 35 U.S.C. § 103 is reversed.

OTHER ISSUE

We note that the carbohydrate derivatizing agent of kit claims 15, 16 and 18 differs from the derivatizing agent of method claims 3-7, 14 and 23-32 in at least one significant aspect: it is not limited to one capable of covalently binding the free functional groups of a carbohydrate. Despite this difference, claims 15, 16 and 18 were included in the rejection of all the claims under 35 U.S.C. § 103 without comment. Thus, it appears that the patentability of the kit claims has not been separately considered. Upon return of the application to the examining group, we urge the examiner to take a step back and ensure that the patentability of the kit claims has been separately evaluated.

REVERSED

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WILLIAM F. SMITH	)
Administrative Patent Judge	)
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	) BOARD OF PATENT
RICHARD TORCZON	)
Administrative Patent Judge	) APPEALS AND
	)
	) INTERFERENCES
	)
HUBERT C. LORIN	)
Administrative Patent Judge	)

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