

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EDWARD S. YEUNG, LANCE B.
KOUTNY, BARRY L. HOGAN, KING
C. CHAN and YINFA MA

Appeal No. 94-4081
Application 07/750,031¹

ON BRIEF

Before JOHN D. SMITH, GARRIS and WALTZ, ***Administrative Patent Judges.***

WALTZ, ***Administrative Patent Judge.***

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 42-46, which are the only claims

¹ Application for patent filed August 14, 1991. According to applicants, the application is a division of Application 07/472,315, filed January 30, 1990, now Patent Number 5,192,407, issued March 9, 1993.

Appeal No. 94-4081
Application 07/750,031

remaining in this application.²

The present invention, according to appellants, is a method for indirectly detecting constituent components of a mixture separated in a separation process by first preparing a generally uniform fluorescing background, then causing separation of the ionic constituent components and observing the variations in fluorescence intensity of the relevant area (specification, page 5, and the main brief, pages 11-13).

As noted by appellants on page 17 of the main brief, the set of claims directed to a method are grouped together and thus stand or fall together in regards to the section 103 rejection.³ The subject matter on appeal is adequately illustrated by independent claim 42 and dependent claim 46, reproduced below:

42. A method for detection of certain components of a mixture of charged components in a separation process comprising:

creating a buffer solution containing a concentration of flourophore [sic, fluorophore] including fluorescing charged components;

² The final rejections of claims 30 and 37-46 were originally appealed. However, the amendment dated Dec. 3, 1993 (Paper No. 23), submitted with the reply brief of the same date (Paper No. 22), cancelled claims 30 and 37-41. The supplemental answer dated Feb. 18, 1994 (Paper No. 24) stated that this amendment was entered, thus leaving claims 42-46 as the only claims on appeal.

³ The only other rejection involves just one claim (claim 46). See 37 CFR § 1.192(c)(5)(1992).

Appeal No. 94-4081
Application 07/750,031

preparing a medium for separating a mixture including charged components wherein the separation is based on differential interaction;

distributing generally uniformly through the medium the buffer solution;

causing separation of at least the charged components of the mixture based on differential interaction through the medium where like-charged flourophore [sic, fluorophore] components are displaced by like-charged mixture components;

laser scanning a laser beam in a two dimension scan across the medium after separation of components of the mixture;

detecting variations in fluorescing light intensity correlated to location of the laser beam during the scan across the medium; and

determining the presence or absence of mixture components at certain locations by the level of light intensity at certain locations, the light intensity or lack thereof comprising of physical characteristic of the flourophore [sic, fluorophore] and not of the mixture.

46. The method of claim 37 [sic, claim 37 was renumbered as present claim 42] wherein the medium is contained within a capillary tube.

The examiner has relied upon the following reference as evidence of obviousness:

Ma et al. (Ma), "Indirect Fluorometric Detection of Anions in Thin-Layer Chromatography", 60 *Anal. Chem.*, No. 7, 722-724 (April 1, 1986).

Appeal No. 94-4081
Application 07/750,031

Claim 46 stands rejected under 35 U.S.C. § 112, second paragraph, "as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention" (main answer⁴, page 4). Claims 42-45 stand rejected under 35 U.S.C. § 103 as unpatentable over Ma. We have considered all the evidence and argument of record, including the main brief, the main answer, and the corresponding three reply briefs and supplemental answers. We *affirm* the rejection under § 103 but *reverse* the rejection under § 112, second paragraph, for reasons which follow.

OPINION

A. The Rejection under 35 U.S.C. § 112, Second Paragraph

Claim 46 recites that the medium for separating a mixture is contained within a capillary tube. The examiner states that claim 46 (incorrectly noted as claim 48 on page 4 of the main answer) includes the limitation of claim 42 of "laser scanning a laser beam in a two dimensional scan across the medium". The

⁴ Claim 46 was finally rejected under 35 U.S.C. § 112, first and second paragraphs (see the final rejection dated Sept. 30, 1992, Paper No. 14). However, the examiner's answer dated Sept. 1, 1993 (Paper No. 21) did not repeat the rejection of claim 46 under the first paragraph of section 112, only rejecting this claim under the second paragraph of section 112. Therefore this merits panel takes the rejection of claim 46 under the first paragraph of section 112 as having been withdrawn. See *the MPEP*, § 1208, page 1200-15, 6th ed., Rev. 3, July 1997.

Appeal No. 94-4081
Application 07/750,031

examiner questions why would one scan a separation in a capillary tube when two dimensional scanning has meaning only in a medium such as a TLC (thin-layer chromatography) plate (main answer, pages 4-5). Appellants submit that a laser can perform a two dimensional scan of all sorts of structures including those that are small with small cross-sectional diameter (main brief, page 18).

The legal standard for indefiniteness under paragraph two of § 112 is whether a claim reasonably apprises those of skill in the art of its scope. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1217, 18 USPQ2d 1016, 1030 (Fed. Cir.), cert. denied sub nom., *Genetics Inst., Inc. v. Amgen, Inc.*, 112 S.Ct. 169 (1991). The definiteness of the language employed must be analyzed, not in a vacuum, but always in light of the teachings of the prior art and the application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. *In re Angstadt*, 537 F.2d 498, 501, 190 USPQ 214, 217 (CCPA 1976).

The examiner has not presented any reasoning or evidence why one of ordinary skill in the art would not be apprised of the scope of claim 46. Laser scanning is admittedly well known in the art (main brief, page 24). A capillary tube is also well

Appeal No. 94-4081
Application 07/750,031

known and has two dimensions. Appellants' contention that laser scanning can be applied to small structures has not been rebutted by the examiner (main brief, page 18). Therefore claim 46 reasonably apprises one of ordinary skill in the art of its scope.

The examiner has not shown or adequately explained why two dimensional scanning "has meaning only in a medium such as a TLC plate" (main answer, paragraph bridging pages 4-5). Accordingly, the rejection of claim 46 under 35 U.S.C. § 112, second paragraph, is reversed.

B. The Rejection under 35 U.S.C. § 103

The rejection of claims 42-45 under § 103 as unpatentable over Ma is affirmed for substantially the reasons set forth by the examiner in the main answer, pages 5-8. We add the following comments for emphasis.

Appellants argue that Ma deals with indirect fluorometric detection but with respect to thin-layer chromatography that does not utilize differential electrical interaction between charged components of the mixture being separated and an electric potential (main brief, page 7, emphasis added). Appellants similarly argue that "the nature of separation in the present

Appeal No. 94-4081
Application 07/750,031

application involves a setting up of an electric potential" (main brief, page 8) and claim 42 specifically calls for separation "based on differential interaction" (emphasis appellants', main brief, page 30). Appellants state that "differential interaction" pertains to the electric potential set up in the plates or surface (main brief, page 30). Finally, appellants emphatically state that the claimed invention utilizes an electric potential between portions of the plate or surfaces (main brief, page 39).

Appellants are correct in noting that the method of claim 42 calls for separation of the charged components of a mixture by differential interaction through the medium. However, there is no basis for appellants' contention that an electric potential is a limitation of the claimed method. The claims now on appeal do not call for any limitation regarding an electric potential. The term "differential interaction" is characterized in claim 42 as "where like-charged flourophore [sic, fluorophore] components are displaced by like-charged mixture components" (see claim 42, lines 12-13, and also the main brief, page 14). Ma discloses this same separation concept of "differential interaction", although using different terminology, at page 723, right column:

Appeal No. 94-4081
Application 07/750,031

The nature of the response is one of replacement. Local charge neutrality (uniform cation distribution) and competition for available anion exchange sites cause a depletion of salicylate [the fluorescing ion] where the analyte ions reside, producing a lower fluorescence signal.

Appellants also argue that the reference does not teach the method of indirect detection combined with the concept of laser scanning and detection of lack of light intensity (main brief, pages 19 and 28). As discussed above, Ma does disclose the method of indirect detection as set forth in the appealed claims, including detection of lack of light intensity (page 723, left column, first two full paragraphs, and the above-quoted portion of the right column). Ma also discloses laser fluorometry (page 723, left column, lines 2-4) and the expectation of improved detectability with laser-excited fluorescence (page 724, right column). As admitted by appellants, the "[P]rior art clearly uses laser scanning to excite fluorescing particles." (main brief, page 24, and see also page 37 of the main brief, second full paragraph). The use of well known laser-excited fluorescence or scanning in the detection scheme of Ma is clearly suggested. See *In re O'Farrell*, 853 F.2d 894, 903-904, 7 USPQ2d

Appeal No. 94-4081
Application 07/750,031

1673, 1681 (Fed. Cir. 1988) ("For obviousness under § 103, all that is required is a reasonable expectation of success.").

Appellants argue that the claimed invention "teaches away" from Ma since it uses a different type of displacement of particles (main brief, page 40). However, as previously discussed, there is no difference in the language of claim 42 that distinguishes between the "displaced" ions of appellants' method and the "replacement" of ions as disclosed by Ma at page 723.

Based on the foregoing reasons, we conclude that the subject matter of claims 42-45 would have been *prima facie* obvious based on the teachings found in Ma. Appellants have not presented objective evidence of nonobviousness, on this record, which would serve to rebut the *prima facie* case. Accordingly, the rejection of claims 42-45 under 35 U.S.C. § 103 as unpatentable over Ma is affirmed.

Appeal No. 94-4081
Application 07/750,031

C. Summary

The rejection of claim 46 under 35 U.S.C. § 112, second paragraph, is reversed. The rejection of claims 42-45 under 35 U.S.C. § 103 as unpatentable over Ma is affirmed. Therefore, the decision of the examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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JOHN D. SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
BRADLEY R. GARRIS)	
Administrative Patent Judge)	APPEALS AND
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Appeal No. 94-4081
Application 07/750,031

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