

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. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex Parte HIROKAZU IKEDA

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Appeal No. 2001-0163  
Application 08/951,502

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ON BRIEF

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Before GARRIS, OWENS and JEFFREY T. SMITH, *Administrative Patent Judge*.

JEFFREY T. SMITH, *Administrative Patent Judge*.

***Decision on appeal under 35 U.S.C. § 134***

Applicant appeals the decision of the Primary Examiner's refusal to allow claims 11 to 21, all of the pending claims in the application. We have jurisdiction under 35 U.S.C. § 134.

***THE INVENTION***

The Appellant's claimed invention relates to a method of separating optical isomers in a simulated moving bed chromatography system which utilizes a packing material for the optical resolution of an optical isomer mixture. The packing material used is composed of particles of a polysaccharide derivative unsupported by silica gel. According to the Appellant, the unsupported polysaccharide derivative provides an excellent ability to resolve and separate optical isomers in a high pressure environment. (Brief, p. 2). Claim 11 which is representative of the invention is reproduced below:

11. A method of separation of optical isomers using a simulated moving bed chromatographic apparatus which comprises:

forming a circulation circuit comprising a plurality of columns each provided with an inlet port and an outlet port and packed with particles of polysaccharide derivatives, said columns being serially and endlessly connected so as to achieve serial and unidirectional fluid flow through said columns, wherein the particles of polysaccharide derivatives are not supported on a silica gel carrier;

introducing an optical isomer mixture to be separated into one of the columns via the inlet port thereof in order to cause adsorbable or strongly adsorbable substances to become adsorbed on the particles of polysaccharide derivatives in the column and several columns that follow;

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drawing out a solution rich in the other substances being non-adsorbable or poorly adsorbable on the particles of polysaccharide derivatives via the outlet port of another one of the columns;

introducing an eluent into still another one of the columns via the inlet port thereof;

drawing out a solution rich in the adsorbable or strongly adsorbable substances via the outlet port of further another one of the columns; and

passing the remaining solution and the eluent through the circuit and recirculating them,

wherein the position for introducing the eluent, the position for drawing out the solution containing the adsorbable or strongly adsorbable substances, the position for introducing the optical isomer mixture and the position for drawing out the solution containing the non-adsorbable or weakly adsorbable substances are arranged in the circulation in this order along the direction of the fluid flow, and the positions are successively moved in the direction of the fluid flow in the circuit intermittently.

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***CITED REFERENCES***<sup>1</sup>

As evidence of unpatentability, the Examiner relies on the following references:

Yamashita et al. (Yamashita)	5,126,055	Jun. 30, 1992
Ikeda (Ikeda '852)	5,354,852	Oct. 11, 1994
Ikeda <sup>2</sup> (Ikeda '635) (Published PCT Application)	WO 92/15635	Sep. 17, 1992

The Examiner rejected claims 11 to 21 under 35 U.S.C. § 102(b) as anticipated by or in the alternative, under 35 U.S.C. § 103 as obvious over Yamashita. The Examiner also rejected claims 11 to 21 under 35 U.S.C. § 103 as obvious over the combination of Yamashita, Ikeda '852 and Ikeda '635. (Answer, pp. 3-4).

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<sup>1</sup> In rebuttal to the Examiner's rejections, the Appellant cites the following references:

Okamoto et al. (Okamoto)	4,861,872	Aug. 29, 1989
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Negawa et al., "Optical Resolution by Simulated Moving-Bed Absorption Technology", J. Chromatography 590:113-117 (1992).

Nagamatsu et al., "Optical resolution of pharmaceutical intermediate by Simulated Moving Bed" Chiral Europe '96 (1996).

<sup>2</sup> We will rely on the translation of the this document which has been filed in the record.

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### ***OPINION***

We reverse the aforementioned rejections. We need to address only the independent claims, i.e., claims 11 and 21.

In order for a claimed invention to be anticipated under 35 U.S.C. § 102, all of the elements of the claim must be found in one reference. *See Scripps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991); *In re Schreiber*, 44 USPQ2d 1429, 1433 (Fed. Cir. 1997), (“To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.”)

In rejecting claims 11 and 21 the Examiner states that “[t]he claims are considered to read on Yamashita. (Answer, p. 3). The Examiner also states that “if a difference exists between the claims and Yamashita ... it would have been obvious to optimize the steps of Yamashita to enhance separation. (Answer, p. 3).

We cannot uphold the Examiner’s rejection. Appellant’s claims 11 and 21 both require particles of polysaccharide derivatives which are not supported on a silica gel carrier. The Examiner has not adequately explained where Yamashita discloses the use of a packing material which is not supported on silica gel. The Examiner also has not explained how optimizing the steps of Yamashita would have motivated a person

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of ordinary skill in the art to employ a packing material which is not supported on silica gel. The mere fact that the prior art could be modified as proposed by the examiner is not sufficient to establish a *prima facie* case of obviousness. *See In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). Consequently, the Examiner's rejection of claims 11 to 21 over Yamashita is reversed.

The Examiner also rejected claims 11 to 21 under 35 U.S.C. § 103 as obvious over the combination of Yamashita, Ikeda '852 and Ikeda '635.

Appellant's claims 11 and 21 both are directed to a method of separation of optical isomers using a simulated moving bed chromatographic apparatus. The claimed invention requires the use of particles of polysaccharide derivatives which are not supported on a silica gel carrier.

The Examiner asserts Yamashita differs from the claimed invention in the recitation of the specific adsorbent packing material. To remedy this deficiency the Examiner relies on Ikeda '852 and Ikeda '635. According to the Examiner Ikeda '635 and '852 disclose that Ikeda's carbamate of a polysaccharide has a larger separation factor than Yamashita and is suitable for use in preparative liquid chromatography. (Answer, p. 4).

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Yamashita describes a process of separating an optical isomer. The process employs a simulated moving bed system. The packed bed of the simulated moving bed system contains a silica gel having carried thereon an optically active high-molecular compound or a low-molecular compound. (Col. 2, ll. 20-33).

Both Ikeda '852 and Ikeda '635 disclose preparative liquid chromatography which contains polysaccharide derivatives in the stationary phase. The polysaccharide derivatives are disclosed to have a separation coefficient greater than that of polysaccharide derivatives supported on silica gel. (Ikeda '635, p. 2; and Ikeda '852, cols. 1 and 3).

Appellant argue, Brief, pages 11-12, that there is a significant pressure difference between a simulated moving bed multicolumn chromatography and a single column (stationary phase) liquid chromatography. In support of their position, Appellant cite the Okamoto, Negawa and Nagamatsu references. Thus, the Appellant assert that a person of ordinary skill in the art would not look to references that describe single column (stationary phase) liquid chromatography (low pressure system), i.e., Ikeda '852 and Ikeda '635, to determine suitable packing materials for a simulated moving bed multicolumn chromatography process (high pressure system). (Brief, p. 13).

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We agree with Appellant. The Examiner has not explained, or cited evidence that explained, that the advantages achieved with unsupported polysaccharide derivatives in a single column (stationary phase) liquid chromatography process would also have been expected to have been achieved in a simulated moving bed multicolumn chromatography process. The record indicates that the motivation relied upon by the Examiner for using unsupported polysaccharide derivatives in a simulated moving bed multicolumn chromatography process comes from the Appellant's description of their invention in the specification rather than coming from the applied prior art and that, therefore, the Examiner used impermissible hindsight in rejecting the claims. *See W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983); *In re Rothermel*, 276 F.2d 393, 396, 125 USPQ 328, 331 (CCPA 1960). Consequently, the Examiner's rejection is reversed.

### ***CONCLUSION***

The rejection of claims 11 to 21 under 35 U.S.C. §§ 102 and 103 over Yamashita is reversed. The rejection of claims 11 to 21 under 35 U.S.C. § 103 as obvious over the combination of Yamashita, Ikeda '852 and Ikeda '635 is reversed.

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**REVERSED**

BRADLEY R. GARRIS  
*Administrative Patent Judge*

TERRY J. OWENS  
*Administrative Patent Judge*

JEFFREY T. SMITH  
*Administrative Patent Judge*

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