



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/272,973	11/18/2008	Marshall W. Bern	PROT-20080360-US-NP	7337
124903	7590	11/23/2016	EXAMINER	
Park, Vaughan, Fleming & Dowler LLP -- Yao Group 2800 Fifth Street, Suite 110 Davis, CA 95618			BORIN, MICHAEL L	
			ART UNIT	PAPER NUMBER
			1631	
			NOTIFICATION DATE	DELIVERY MODE
			11/23/2016	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

syadmin@parklegal.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* MARSHALL W. BERN<sup>1</sup>

---

Appeal 2015-006279  
Application 12/272,973  
Technology Center 1600

---

Before RYAN H. FLAX, TIMOTHY G. MAJORS, and  
DEVON ZASTROW NEWMAN, and, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) involving claims directed to a method for identifying potential modifications to peptides. Claims 1–20 are on appeal as rejected under 35 U.S.C. § 101. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

STATEMENT OF THE CASE

The appealed claims can be found in the Claims Appendix of the Appeal Brief. Claims 1, 15, and 20 are the independent claims. Claim 1 is representative and reads as follows:

---

<sup>1</sup> The Real Party in Interest is Protein Metrics Inc. App. Br. 1.

1. A method for identifying potential modifications to peptides associated with a precursor peptide, comprising:

receiving a set of tandem-mass-spectrometry data associated with the precursor peptide, wherein the received spectral data indicates a measured mass for the precursor peptide and a number of peak locations;

accessing, by one or more computers, a peptide or protein database to obtain spectral information for candidate peptides;

generating, by one or more computers, multiple theoretical spectra for the candidate peptides using the spectral information, wherein generating multiple theoretical spectra for a respective candidate peptide involves:

identifying one or more known mass modifications for the candidate peptide;

determining at least one variable mass modification to at least one amino acid within the candidate peptide;

varying the variable mass modification within a predetermined range to produce a set of varied mass modifications; and

for each varied mass modification, generating a modified theoretical spectrum for the candidate peptide by combining the known mass modifications and the variable mass modification; and

identifying the potential modifications by comparing the peak locations of the received spectral data with peak locations of each modified theoretical spectrum in the generated theoretical spectra.

App. Br. 25 (Claims App'x).

The following rejection is on appeal:

Claims 1–20 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter, i.e., an abstract idea. Non-final Action 2–3.<sup>2</sup>

#### DISCUSSION

The Examiner determined all pending/appealed claims are directed to an abstract idea, i.e., computational analysis, or, converting one form of numerical representation into another (in analyzing protein mass-spectrometry data) (claims 1–14). Non-final Action 4–5; Ans. 2. The Examiner further determined the claims do not add limitations that transform the abstract idea into something more than a patent-ineligible abstract idea, as they simply require generic computer implementation (they do not purport to improve the functioning of the computer or effect an improvement in any other technology or technical field). Non-final Action 5.

In analyzing patent eligibility questions under 35 U.S.C. § 101, the Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept.” *Alice Corp. Pty Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014). If this threshold is met, we move to a second step of the inquiry and “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297 (2012)).

---

<sup>2</sup> Appeal is taken from the Non-final Action dated Aug. 14, 2014.

Taking up the first step of the patent-eligibility analysis, claim 1 is reasonably directed to an abstract idea because it relates to the mathematical analysis of data; however, we note, “[a]t some level, ‘all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas,’” and whether one takes a macroscopic or microscopic view of a claim may be determinative on the issue. *Alice*, 134 S. Ct. at 2354 (quoting *Mayo*, 132 S. Ct. at 1293); and see *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, --- F.3d ---, 2016 WL 6440387 \*9 (Fed. Cir. Nov. 1, 2016). Looking to the Specification to enlighten us as to the claimed invention, as did the Federal Circuit in *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), we find it expressly explains the invention to be directed to “techniques for analyzing mass-spectrometry data,” which is the abstract idea of the mathematical analysis of data. Spec. ¶ 1. Data analysis and algorithms are abstract ideas. See, e.g., *Alice* 134 S. Ct. at 2355; *Bilski v. Kappos*, 561 U.S. 593, 611 (2010); *Parker v. Flook*, 437 U.S. 584, 594–95 (1978); and *Gottschalk v. Benson*, 409 U.S. 63, 71–72 (1972). Put concisely, “[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.” *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014).

Turning to the second step under *Alice*, the facts and claimed subject matter here are analogous to those of the recent Federal Circuit decision in *Amdocs*, 2016 WL 6440387, which leads us to determine that the claims recite the “something more” required by the Supreme Court to transform an abstract idea into a patent-eligible invention. See also *Alice*, 134 S. Ct. at

2355 (citing *Mayo*, 132 S. Ct at 1303). As in *Amdocs*, here, claim 1 may be directed to an abstract idea of analyzing data using mathematical algorithms, but it entails unconventional technical solutions (i.e., creating theoretical spectra including known and variable mass modifications of peptide amino acids) to a technological problem (i.e., the difficulty in identifying peptides that are prone to chemical modifications, both expected and unknown, using spectral data). See Spec. ¶¶ 4, 5, 6, 8, 25, 32, 33, and 38; see also *Amdocs*, 2016 WL 6440387 at \*10. As in *Amdocs*, claim 1 ties the invention to a structure – “one or more computers” and, indirectly, to mass-spectrometer(s). See claim 1, *supra*; see also *Amdocs*, 2016 WL 6440387 at \*10. As in *Amdocs*, claim 1 is not drawn to preempt the generic enhancement of data in a similar system, but is directed to a technological solution needed in peptide analysis using mass-spectroscopy. See claim 1, *supra*; see also *Amdocs*, 2016 WL 6440387 at \*10. Considered as an ordered combination, we are not persuaded that claim 1 recites an invention that is merely the routine or conventional use of technology previously known to skilled persons.

For the reasons above, we reverse the rejection of claim 1 and its dependent claims under 35 U.S.C. § 101.

#### SUMMARY

The rejection of claims 1–20 under 35 U.S.C. § 101 is reversed.

#### REVERSED