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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/825,379	03/21/2013	Marc S. Penn	CCF-018733 US PCT	9198

26294 7590 12/12/2016

TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P.
1300 EAST NINTH STREET, SUITE 1700
CLEVELAND, OH 44114

EXAMINER
CHEU, CHANGHWA J

ART UNIT	PAPER NUMBER
1678	

NOTIFICATION DATE	DELIVERY MODE
12/12/2016	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARC S. PENN and EDWARD J. LESNEFSKY

Appeal 2015-006953
Application 13/825,379
Technology Center 1600

Before RICHARD M. LEBOVITZ, JEFFREY N. FREDMAN, and JOHN E. SCHNEIDER, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal[1] under 35 U.S.C. § 134 involving claims to a method for predicting myocardial damage in a subject having or at risk of cardiac disease. The Examiner rejected the claims as directed to non-statutory subject matter. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Statement of the Case

Background

"Plasma levels of high-density lipoproteins (HDL) and apolipoprotein AI (ApoAI) are inversely associated with cardiovascular morbidity and mortality" (Spec. ¶ 3). "An aspect of the application relates to a method for predicting myocardial damage in a subject having or at risk of cardiac

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[1] Appellants identify the Real Party in Interest as The Cleveland Clinic Foundation (*see* App. Br. 3).

disease. The method includes determining a level of apolipoprotein AI (ApoAI) and a level of CoQ10 in the subject" (Spec. ¶ 6).

The Claims

Claims 1, 6–9, 14–17, and 22–24 are on appeal. Claim 1 is representative and reads as follows:

> 1. A method for predicting myocardial damage in a subject having or at risk of cardiac disease, the method comprising:
>
> obtaining one or more plasma samples from the subject, the one or more plasma samples including CoQ_{10} and ApoAI;
>
> determining a level of apolipoprotein AI (ApoAI) in the subject;
>
> determining a level of Coenzyme Q_{10} (CoQ_{10}) in the subject, wherein the level of ApoAI and CoQ_{10} in the subject is determined using an ELISA assay and/or high-performance liquid chromatography; and
>
> comparing the determined levels of ApoAI and CoQ_{10} to control levels, wherein a decreased level of ApoAI and a decreased level of CoQ_{10} compared to control levels are indicative of the subject having an increased risk of greater myocardial damage following a myocardial infarction.

The Issue

The Examiner rejected claims 1, 6–9, 14–17, and 22–24 under 35 U.S.C. § 101 as directed towards non-statutory subject matter (Ans. 3–5).

The issue with respect to this rejection is: Does the evidence of record support the Examiner's conclusion that the claims are directed towards non-statutory subject matter?

Findings of Fact

1. The Specification teaches "[a]fter obtaining the biological sample from the subject, the levels of the cardiac markers *(e.g.,* ApoAI and

CoQ10) are determined using any one or combination of ***known*** biochemical assays or techniques" (Spec. ¶ 35; emphasis added).

2. The Specification teaches that known techniques include "antibody based assays, such as ELISA and Western blots, mass spectroscopy (MS) *(e.g.,* LC/ESl/MS/MS), fluorometric assays and chromatography *(e.g.,* HPLC, affinity column, etc.)" (Spec ¶ 35).

3. The Specification cites to Tang et al., *HPLC Analysis of Reduced and Oxidized Coenzyme Q_{10} in Human Plasma*, 47 Clinical Chemistry 256–265 (2001), demonstrating that HPLC analysis of CoQ_{10} was known as of 2001 (Spec. ¶ 36).

4. The Specification teaches that "[c]ontrol levels of ApoAI polypeptides and CoQ_{10} in biological samples, for example, can be obtained *(e.g.,* mean levels, median levels, or 'cut-off' levels) by assaying a large sample of subjects in the general population . . . as described in Knapp, R.G. and Miller, M.C. (1992): Clinical Epidemiology and Biostatistics" (Spec. ¶ 40).

Principles of Law

> In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.,* . . . 132 S.Ct. 1289 . . . (2012), the Supreme Court set forth a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts. First, we determine whether the claims at issue are directed to a patent-ineligible concept. *Id.* at 1297. If the answer is yes, then we next consider the elements of each claim both individually and "as an ordered combination" to determine whether additional elements "transform the nature of the claim" into a patent-eligible application. *Id.* at 1298. The Supreme Court has described the second step of this analysis as a search for an "inventive concept"—i.e., an element or combination of elements that is "sufficient to ensure that the patent in practice

> amounts to significantly more than a patent upon the [ineligible concept] itself." *Id.* at 1294.

Ariosa Diagnostics v. Sequenom, Inc. 788 F.3d 1371, 1375 (Fed. Cir. 2015).

Analysis

We follow the analytical framework set forth by the Supreme Court in *Mayo* and applied by our reviewing court in *Ariosa*. Under this rubric, we agree with the Examiner that claim 1 sets forth a patent-ineligible law of nature, specifically, the relationship between CoQ_{10} and ApoAI levels as measured by ELISA and/or HPLC and the likelihood that a patient is at risk for cardiac disease (*see* Ans. 4).

Consistent with *Mayo*, "[i]f a law of nature is not patentable, then neither is a process reciting a law of nature, unless that process has additional features that provide practical assurance that the process is more than a drafting effort designed to monopolize the law of nature itself." *Mayo* at 1297. In this case, none of the steps in claim 1 represent more than drafting effort. The Specification acknowledges that monitoring levels of ApoAI and CoQ_{10} by HPLC or ELISA are known (FF 1–2) and specifically identifies prior art assays for performing HPLC measurement of CoQ_{10} (FF 3) and determining control levels (FF 4). We therefore agree with the Examiner that there is no principled distinction between the instant claim 1 and the claim at issue in *Mayo*.

Appellants contend that

> claims 1, 6-9, 14-17, and 22-24 apply a law of nature to a new and useful end and do not attempt to merely claim the law itself. The present application is based upon the discovery of the law of nature that specific biomarkers are decreased in the plasma of patients with an increased risk of

> greater myocardial damage following a myocardial infarction and that the amounts or levels of these markers can be used to predict and/or determine myocardial damage in a subject having or at risk of cardiac disease.

(App. Br. 9; *cf.* App. Br. 10).

We do not find these arguments persuasive because, as in *Mayo*, the "'wherein' clauses simply tell a doctor about the relevant natural laws, at most adding a suggestion that he should take those laws into account when treating his patient. That is to say, these clauses tell the relevant audience about the laws while trusting them to use those laws appropriately." *Mayo*, 132 S.Ct. at 1297. There is no reasonable doubt that the law of nature in *Mayo* was also being applied for a new and useful end, optimizing 6-thioguanine therapeutic efficacy, but the Supreme Court found that this application was insufficient for patentable utility because the claim "steps are not sufficient to transform unpatentable natural correlations into patentable applications of those regularities." *Id.* at 1298. The steps of the instant claim are demonstrably routine, conventional activity (FF 1–4) and "add nothing significant beyond the sum of their parts taken separately." *Id.*

Appellants contend that

> In contrast to the claims in *Mayo,* claims 1, 6-9, 14-17, and 22-24 include additional steps or a combination of steps that integrate a law of nature into the claimed invention such that that the law of nature is practically applied and the steps include activity that goes beyond what was well-understood, routine or conventional activity for researchers in the field. . . .
>
> The recited steps of claims 1, 6-9, 14-17, and 22-24 are not directed to routine, well-understood, or conventional activity previously engaged by researchers in the field. Prior to the

> present application, researchers did not routinely determine the risk of greater myocardial damage in a subject having or at risk of cardiac disease using the determined levels of ApoA1 or HDL and CoQ10 in a bodily sample obtained from plasma of a subject.

(App. Br. 12; *cf.* Reply Br. 3).

We find this argument unpersuasive because, as the Specification acknowledges, the ELISA and HPLC techniques for measuring ApoAI and CoQ_{10} levels were known in the prior art (FF 1–3) as was the use of controls (FF 4). That these known prior art processes were not previously applied to determining risk of cardiac disease does not distinguish the claims because "appending routine, conventional steps to a natural phenomenon, specified at a high level of generality, is not enough to supply an inventive concept." *Ariosa*, 788 F.3d at 1378.

Appellants contend that "others are not foreclosed, for example, from determining a level of ApoA1 or HDL and CoQ_{10} in a sample that is not plasma *(e.g.,* another tissue type) using different assays" (App. Br. 14; *cf.* Reply Br. 4).

We do not find this argument persuasive because "the absence of complete preemption does not demonstrate patent eligibility. In this case, [patentees] attempt to limit the breadth of the claims by showing alternative uses of [the invention] outside of the scope of the claims does not change the conclusion that the claims are directed to patent ineligible subject matter. Where a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, as they are in this case, preemption concerns are fully addressed and made moot." *Ariosa*, 788 F.3d at 1379.

Thus, even though the claims are limited to the use of two particular known assays, ELISA and HPLC, for analysis of the levels of ApoAI and CoQ_{10}, and do not fully preempt the natural relationship, *Ariosa* explains that the claims remain ineligible because they are drawn to patent ineligible subject matter. *Id.*

Conclusion of Law

The evidence of record supports the Examiner's conclusion that the claims are directed towards non-statutory subject matter.

SUMMARY

In summary, we affirm the rejection of claims 1, 6–9, 14–17, and 22–24 under 35 U.S.C. § 101 as directed towards non-statutory subject matter.

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

AFFIRMED