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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW FINLAY WALLS
and XIAOYING ZHOU[1]

Appeal 2017-007759
Application 12/161,409
Technology Center 1600

Before ERIC B. GRIMES, JEFFREY N. FREDMAN, and DAVID COTTA, *Administrative Patent Judges*.

GRIMES, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method of diagnosing and treating anaphylaxis, which have been rejected as containing new matter and as being directed to patent-ineligible subject matter. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] Appellants identify the Real Party in Interest as the University of Southampton. Br. 3.

STATEMENT OF THE CASE

"[M]ast cell activation as a result of allergen exposure may be triggered on occasions in multiple organ systems (anaphylaxis) and such allergic reactions can be life-threatening." Spec. 1:14–16. "In recent years, immunoassays for mast cell tryptase in serum samples have been helpful in diagnosing . . . anaphylaxis." *Id.* at 1:24–25. "However, it has become increasingly clear that elevation of serum tryptase concentration is not detectable in all cases of anaphylaxis." *Id.* at 1:28–29. The Specification discloses that "a raised level of mast cell carboxypeptidase may be detected in serum samples from individuals as a result of anaphylaxis even though they test negative for serum tryptase." *Id.* at 2:15–17.

Claims 1, 7, 10, and 14–19 are on appeal. Claim 1 is illustrative and reads as follows:

> 1. A method of using an immunoassay to detect an elevated level of mast cell carboxypeptidase following suspected anaphylaxis in order to diagnose anaphylaxis, and treating said anaphylaxis; which comprises:
>
> (a) detecting an elevated level of mast cell carboxypeptidase in a serum or plasma sample by immunoassay; wherein said sample is liable to contain mast cell carboxypeptidase released from mast cells as a result of anaphylaxis, said sample is derived from blood taken from an individual between 8 and 24 hours of the onset of suspected anaphylaxis, and anaphylaxis is diagnosed for the individual when the level of mast cell carboxypeptidase is detected above a baseline level of an unaffected individual; and
>
> (b) treating the individual diagnosed with anaphylaxis.

Claims 1, 7, 10, and 14–19 stand rejected under 35 U.S.C. § 112, first paragraph, for lack of adequate written description (Ans. 2) and under

35 U.S.C. § 101 on the basis that the claimed method is not eligible for patenting (Ans. 3).

I

The Examiner has rejected all of the claims on appeal for lack of adequate written description (new matter). The Examiner finds that

> [c]laims 1 and 19 were amended in the 3/18/16 reply to recite a step of treating the individual diagnosed with anaphylaxis (see preamble and step (b) of the claims).
>
> Support could not be found by the examiner in the specification or claims as originally filed. The specification does not describe treating anaphylaxis following diagnosis.

Ans. 3.

We agree with the Examiner that the Specification fails to provide an adequate written description of the treating step of claim 1.

> Adequate written description means that, in the specification, the applicant must "convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the [claimed] invention." When no such description can be found in the specification, the only thing the PTO can reasonably be expected to do is to point out its nonexistence.

Hyatt v. Dudas, 492 F.3d 1365, 1370 (Fed. Cir. 2007) (citation omitted, alteration in original).

The Specification consistently describes the invention as a method of diagnosis only, and does not mention treatment. *See, e.g.*, Spec. 1:4–6 ("The present invention relates to use of mast cell carboxypeptidase as a marker for mast cell activation, more particularly, for example, as a blood sample marker for mast cell activation resulting in anaphylaxis."), *id.* at 2:14–18 ("[A] raised level of mast cell carboxypeptidase may be detected in serum

samples from individuals as a result of anaphylaxis even though they test negative for serum tryptase. This has pointed the way to new diagnostic use of mast cell carboxypeptidase . . . ."), and *id.* at 3:18–21 ("[T]he present invention thus provides use of an immunoassay for detection of mast cell carboxypeptidase . . . , wherein said use is for diagnosis of anaphylaxis.").

Appellants argue that "[i]t is important to recognize that the rejected subject matter is original to this application." Br. 8. Appellants do not, however, identify where the original Specification describes treating anaphylaxis, and our review of the Specification does not reveal any such description.

Appellants also argue that

> [a] skilled person would recognize that diagnosis of allergic disease is not useful unless the anaphylactic reaction is treated. Certainly, as an alternative to diagnosis by immunoassay of mast cell tryptase as practiced in the prior art, the same treatments can be administered. There was no need to describe such treatment explicitly because the specification does not need to teach, and preferably it omits, what is well known in the art.

Id.

As the Examiner pointed out, however, "[a]lthough it may have been obvious to perform a step of treatment following diagnosis of an individual according to the disclosed methods, obviousness is not the standard for addition of new limitations to the claims." Ans. 3. *See Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010) ("[W]hile the description requirement does not demand any particular form of disclosure, or that the specification recite the claimed invention *in haec verba*, a description that merely renders the invention obvious does not satisfy the requirement.") (citations omitted).

We affirm the rejection of claim 1 under 35 U.S.C. § 112, first paragraph. Claims 7, 10, and 14–19 were not argued separately and therefore fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

II

The Examiner has rejected all of the claims on appeal on the basis that they are "directed to a law of nature/natural phenomenon" and therefore are not eligible for patenting. Ans. 3. The Examiner finds that "the claims are directed to a judicial exception . . . as they recite the naturally occurring correlation between levels of mast cell carboxypeptidase and anaphylaxis. . . . Such concepts as diagnosing an abnormal condition and comparing data to determine diagnosis represent judicial exceptions." Ans. 4.

The Examiner also finds that "although the claims recite that mast cell carboxypeptidase is determined by immunoassay, immunoassays were well-understood, routine and conventional activity at the time of the invention. In fact, others had previously detected mast cell carboxypeptidase by immunoassay." *Id.* at 5, citing Castells.[2] Finally, the Examiner finds that,

> [a]lthough the claims now recite a step of treating, no specific treatment is set forth. Generically invoking treatment, recited at a high level of generically [sic, generality], is insufficient to ensure that the claims amount to significantly more because the generic treatment step would preempt all possible treatments and further does not go beyond routine/conventional activity since treatment of anaphylaxis was known in the prior art.

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[2] Castells et al., "The presence of membrane-bound stem cell factor on highly immature nonmetachromatic mast cells in the peripheral blood of a patient with aggressive systemic mastocytosis," 98 J. Allergy Clin. Immunol. 831–840 (1996).

Id. at 4–5. The Examiner concludes that, "[f]or all of these reasons, the claims fail to include additional elements that are sufficient to amount to significantly more than the judicial exception." *Id.* at 7.

We agree with the Examiner that, under the two-step test of *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014), claim 1 is not directed to patent-eligible subject matter. The *Alice* Court stated that "[i]n *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. —, 132 S.Ct. 1289, 182 L.Ed.2d 321 (2012), we 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." *Alice Corp.*, 134 S. Ct. at 2355.

The *Alice* Court described the *Mayo* test as follows:

> First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we then ask, "[w]hat else is there in the claims before us?" To answer that question, we 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. We have described step two 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. (alterations in original, citations omitted).

The *Mayo* Court applied its test to claims that are similar to those of the instant application. In *Mayo*, the claimed invention was a "method of optimizing therapeutic efficacy for treatment of an immune-mediated gastrointestinal disorder" comprising administering a certain class of drug and then determining the level of 6-thioguanine (6-TG) in a patient, where a

level of 6-TG below or above certain amounts indicated a need to increase or decrease, respectively, the drug dosage. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 74–75 (2012).

Claim 1 of the instant application is similar, in that it is directed to a method of detecting whether the level of mast cell carboxypeptidase in a patient's serum or plasma sample is above a baseline level, and then treating the patient for anaphylaxis. Similar to the method at issue in *Mayo*, therefore, the method of instant claim 1 is directed to a method of providing therapy based on the level of biomarker (mast cell carboxypeptidase) in patient samples.

The *Mayo* Court concluded that the claims at issue in that case "set forth laws of nature—namely, relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." *Id.* at 77.

Similarly here, claim 1 on appeal sets forth a law of nature—namely, a relationship between the level of a certain biomarker (mast cell carboxypeptidase) and the likelihood that (an unspecified) treatment for anaphylaxis is likely to be effective. Under the first step of the *Alice/Mayo* test, claim 1 on appeal is directed to a law of nature or natural phenomenon.

The *Mayo* Court next turned to the question "[w]hat else is there in the claims before us?" *Id.* at 78. The claims in *Mayo* included an "administering" step, a "determining" step, and a "wherein" clause. *Id.* The Court concluded that "[t]he upshot is that the three steps simply tell doctors to gather data from which they may draw an inference in light of the correlations." *Id.* at 79. In other words,

> the claims inform a relevant audience about certain laws of nature; any additional steps consist of well-understood, routine, conventional activity already engaged in by the scientific community; and those steps, when viewed as a whole, add nothing significant beyond the sum of their parts taken separately.

Id. at 79–80. The Court concluded that "the steps are not sufficient to transform unpatentable natural correlations into patentable applications of those regularities." *Id.* at 80.

Like the steps of the claims in *Mayo*, the manipulative steps of claim 1 on appeal also "consist of well-understood, routine, conventional activity already engaged in by the scientific community." *Id.* at 79–80. "Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination." *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1369 (Fed. Cir. 2018). The Castells reference cited by the Examiner shows that using an immunoassay to detect mast cell carboxypeptidase was routine in the art. *See* Castells 833, left col. ("For immunochemistry, slides were incubated . . . with one of the following antibodies: . . . mouse monoclonal anti-CPA (1:800; Sigma Chemical Co., St. Louis, Mo.), mouse monoclonal anti-CPA (gift of Dr. S. Goldstein).") CPA is an abbreviation for carboxypeptidase A. *Id.* at 832, left col. *See also id.* at 839, left col. ("That the mast cells . . . were of the normal phenotype . . . was revealed by the expression of tryptase, chymase, and CPA.").

Claim 1 also recites a step of "treating the individual diagnosed with anaphylaxis," but the Examiner found that "treatment of anaphylaxis was known in the prior art," and concluded that "[g]enerically invoking treatment . . . is insufficient to ensure that the claims amount to significantly more because the generic treatment step would preempt all possible treatments"

(Ans. 4–5). We agree. *See Mayo*, 566 U.S. at 82 ("[S]imply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable."). Claim 1 does not require any specific treatment for anaphylaxis, and thus "the step[] add[s] nothing of significance to the natural laws themselves. Unlike, say, a typical patent on a new drug or a new way of using an existing drug, the patent claims do not confine their reach to particular applications of those laws." *Id.* at 87.

In conclusion, when claim 1 is considered as an ordered combination, it informs a relevant audience of a certain law of nature: specifically, that the level of mast cell carboxypeptidase in a patient's plasma or serum indicates that the patient has anaphylaxis, and that treatment for anaphylaxis is appropriate. All of the additional steps of claim 1 consist of well-understood, routine, conventional activity already engaged in by the scientific community, as shown by the evidence cited by the Examiner. We conclude that, under the *Alice/Mayo* test, claim 1 is directed to patent-ineligible subject matter.

Appellants argue that "the claimed method requires performing an immunoassay with antibody specific for mast cell carboxypeptidase. The antibody was not present naturally in treated patients. See page 10 lines 14-24 of the specification. This is a significant step that is markedly different from anything existing in nature." Br. 9.

The rejection, however, is based on the claimed method being directed to a law of nature—a naturally occurring correlation—not on its using a naturally occurring product. *See Mayo*, 566 U.S. at 77 ("Prometheus' patents set forth laws of nature—namely, relationships between

concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm."), and *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 591 (2013) ("Myriad found the location of the BRCA1 and BRCA2 genes, but that discovery, by itself, does not render the BRCA genes 'new . . . composition[s] of matter,' § 101, that are patent eligible." (alteration in original)). Both categories of invention are ineligible for patenting, but for different reasons. Appellants' arguments on this point are, therefore, unpersuasive.

Appellants also argue that "the sample required by the claims is not a natural product. . . . Neither plasma nor serum exists naturally in the body. The former has an anticoagulant (e.g., EDTA, citrate, or heparin) added; the latter has the clot removed." Br. 10. Appellants, however, cite no evidence to support this position, and "[a]ttorneys' argument is no substitute for evidence." *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989). In any event, as discussed above, the rejection is not based on whether the claimed method uses naturally occurring products, but on whether it amounts to significantly more than the natural correlation between the level of mast cell carboxypeptidase in a patient's serum or plasma and the occurrence of anaphylaxis in the patient.

Finally, Appellants argue that

> [t]he claimed method provides . . . for treatment of patients who would not otherwise have been treated when previously-known methods of diagnosis of anaphylaxis were used. Thus, diagnosis and treatment of individuals by Appellants' invention is neither conventional nor routine. The diagnosis step is practically applied by treating the individual. It was also not conventional or routine to measure the amount of mast cell

> carboxypeptidase in blood taken from an individual between 8 and 24 hours of the onset of suspected anaphylaxis. Therefore, based on analyzing the invention as a whole, Appellants' claimed invention amounts to significantly more than a judicial exception.

Br. 9–10.

This argument is also unpersuasive. As discussed above, detecting mast cell carboxypeptidase using an immunoassay was routine in the art. *See* Castells 833, left col. Appellants do not dispute that treating an individual with anaphylaxis was known, and in fact the Specification discloses nothing regarding treatment. Appellants argue that "[t]here was no need to describe such treatment explicitly because the specification does not need to teach, and preferably it omits, what is well known in the art." Br. 8. Thus, there is no dispute that the treating step of claim 1 was also conventional.

In summary, we conclude that claim 1 does not "contain other elements or a combination of elements, sometimes referred to as an 'inventive concept,' sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the natural law itself." *Mayo*, 566 U.S. at 72–73.

We affirm the rejection of claim 1 under 35 U.S.C. § 101. Claims 7, 10, and 14–19 have not been argued separately and therefore fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

SUMMARY

We affirm both of the rejections on appeal.

TIME PERIOD FOR RESPONSE

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