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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte OM P. SHARMA and MICHAEL F. BLAIR¹

Appeal 2018-004541
Application 14/428,021
Technology Center 3700

Before JENNIFER D. BAHR, MICHELLE R. OSINSKI, and
BRANDON J. WARNER, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1–3 and 5–9. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellant is the Applicant, United Technologies Corporation, which, according to the Appeal Brief, is the real party in interest. Appeal Br. 1.

THE CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter.

1. A gas turbine engine design process comprising the steps of:

determining a location of a hot streak downstream of a combustor nozzle;

determining whether it would be a most beneficial side to have the hot streak initially impact a pressure side of a first static turbine vane or whether it would be more beneficial to have it impact a suction side;

designing a location for the first static turbine vane such that the hot streak will impact the more beneficial side of the first static turbine vane; and

wherein when it is determined that it would be more beneficial to have the benefits of the positioning of the first static turbine vane manifest themselves at a more uniform temperature field when products of combustion will reach a second static turbine vane, then the first static turbine vane is positioned such that the hot streak impacts the pressure side and when it is determined that it would be more beneficial to have the benefits of a more uniform temperature manifest themselves at a first stage rotor then the first static turbine vane is positioned such that the hot streak will impact the suction side.

REJECTIONS

- I. Claims 1–3 and 5 stand rejected under 35 U.S.C. § 101 as directed to patent-ineligible subject matter.
- II. Claims 1–3 and 5–9 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite.²

² The Examiner's inclusion of claim 4 in the statement of this rejection on page 6 of the Final Action is presumed to be an inadvertent error, as this

- III. Claims 1–3 and 5 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
- IV. Claims 6–9 stand rejected under 35 U.S.C. § 102(b) as anticipated by Dudebout (US 6,554,562 B2, iss. Apr. 29, 2003).

DISCUSSION

Rejection I

Section 101 of the patent law provides that one may obtain a patent for “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. The Supreme Court has held that this provision includes important exceptions, notably those that prohibit one from patenting abstract ideas, laws of nature, or natural phenomena. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014). Although a law of nature or an abstract idea is not patentable, the application of these concepts may be patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70–72 (2012).

The Supreme Court has 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*, 134 S. Ct. at 2355 (citing *Mayo*, 566 U.S. at 71–72). Under that framework, we first “determine whether the claims at issue are directed to one of those patent-ineligible concepts”—i.e., a law of nature, a natural phenomenon, or an abstract idea. *Id.* If so, we secondly “consider the elements of each claim

claim was canceled in the Amendment filed May 19, 2017, and, thus, is not involved in this appeal.

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*, 566 U.S. at 77–79). The Supreme Court has described the second part of the 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.* (alteration in original) (quoting *Mayo*, 566 U.S. at 72–73).

Step One: Do the Claims Recite an Abstract Idea?

The Federal Circuit has described the first step as a determination of the “basic character of the claimed subject matter.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1348 (Fed. Cir. 2015) (citing *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1273–74 (Fed. Cir. 2012)). The Federal Circuit has also indicated that this step should determine whether a claimed method “recites an abstraction—an idea, having no particular concrete or tangible form.” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014); *see also Alice*, 134 S. Ct. at 2355 (“The ‘abstract ideas’ category embodies ‘the longstanding rule that “[a]n idea of itself is not patentable.”” (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (further quotations and citations omitted))).

In the present case, the Examiner determines that “[c]laims 1–3, and 5 are directed to a gas turbine engine design process” (Final Act. 4), which “is an abstract idea in that it only requires mental construction” (*id.* at 5). The Examiner also explains that the claims “do not include additional elements that are sufficient to amount to significantly more than the judicial exception

because the claims only recite an abstract idea without an actual process of making an engine.” *Id.* at 4–5.

Appellant argues that the “the Examiner has not . . . met the Patent Office’s minimum criteria for supporting a rejection under 35 U.S.C. § 101.” Appeal Br. 4. In particular, Appellant asserts that “the Examiner’s rejection does not explain why the element corresponds to a concept identified by the courts as an exception.” *Id.* According to Appellant, “[t]he Examiner is required to cite a case,” but “has not done so.” *Id.* We are not persuaded by this argument.

The Federal Circuit has repeatedly noted that “the prima facie case is merely a procedural device that enables an appropriate shift of the burden of production.” *Hyatt v. Dudas*, 492 F.3d 1365, 1369 (Fed. Cir. 2007) (citing *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992)). The court has, thus, held that the USPTO carries its procedural burden of establishing a prima facie case when its rejection satisfies the requirements of 35 U.S.C. § 132 by notifying the applicant of the reasons for rejection, “together with such information and references as may be useful in judging of the propriety of continuing the prosecution of [the] application.” *See In re Jung*, 637 F.3d 1356, 1362 (Fed. Cir. 2011). Thus, all that is required of the Office is that it set forth the statutory basis of the rejection, and the reference or references relied on, if any, in a sufficiently articulate and informative manner as to meet the notice requirement of § 132. *Id.*; *see also Chester v. Miller*, 906 F.2d 1574, 1578 (Fed. Cir. 1990) (35 U.S.C. § 132 “is violated when a rejection is so uninformative that it prevents the applicant from recognizing and seeking to counter the grounds for rejection.”).

Here, in rejecting claims 1–3 and 5 under § 101, the Examiner analyzed the claims using the *Mayo/Alice* two-step framework, and explained to Appellant that the claims are directed to a gas turbine engine design process, which “is an abstract idea in that it only requires mental construction of idea.” Final Act. 5. Thus, the Examiner notified Appellant of the reasons for the rejection “together with such information . . . as may be useful in judging of the propriety of continuing the prosecution of [the] application.” 35 U.S.C. § 132. In other words, the Examiner’s rejection satisfies the initial burden of production by identifying the claims as directed to a gas turbine engine design process, and identifying the recited claim limitations as abstract. *See* Final Act. 4–5.

We agree with the Examiner that Appellant’s claims are directed to an abstract idea involving only mental processes. *See id.* at 5; Ans. 2–3. Claim 1 recites steps of *determining* a hot streak location, *determining* whether it would be more beneficial for the hot streak to impact the pressure side or the suction side of a static turbine vane, and *designing* a location for the static turbine vane so that the hot streak impacts the more beneficial side. These steps can be performed entirely mentally or using pen and paper, and, thus, the gas turbine engine design process of claim 1 amounts to an abstract idea. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) (“[A] method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101.”); *see also In re Comiskey*, 554 F.3d 967, 979 (Fed. Cir. 2009) (“[M]ental processes—or processes of human thinking—standing alone are not patentable even if they have practical application.”); *Benson*, 409 U.S. at 67 (“Phenomena of nature, . . . , mental processes, and abstract intellectual concepts are not patentable,

as they are the basic tools of scientific and technological work” (emphasis added)).

Step Two: Is There an Inventive Concept?

Appellant argues that, “[e]ven if some of the design steps could be purely mental, the additional step of positioning the hot streak dependent on the alleged abstract idea transforms a particular article (an engine design) into a different state, and improves the field of gas turbine engines.” Appeal Br. 4 (citing *Diamond v. Diehr*, 450 U.S. 175 (1981)). According to Appellant, the “claim specifically places a component (the first static turbine vane) dependent upon the design process,” which “is an absolutely concrete step.” *Id.*; see also Reply Br. 1 (asserting that the claim recites “a physical step,” in which the static turbine vane is positioned).

Appellant’s argument is not persuasive because the broadest reasonable interpretation of claim 1 does not require physically placing or positioning the static turbine vane in an engine. Instead, the claim only requires “*designing* a location for the first static turbine vane such that the hot streak will impact the more beneficial side of the first static turbine vane.” Appeal Br. 7 (Claims App.) (emphasis added). Although the claim recites that “the first static turbine vane *is positioned*” (*id.* (emphasis added)), the claim does not recite a step of physically positioning the first static turbine vane in the engine. Rather, the recitation that the “turbine vane is positioned” is contained within the step of “designing a location for the first static turbine vane,” which, as discussed above, encompasses mental activity. In this regard, Appellant’s reliance on *Diehr* is unavailing. The claims at issue in *Diehr* recited a method that included automatically opening a press based on the calculations and comparisons. See *Diehr*, 450

U.S. at 187 (explaining that the claimed method requires “installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time”). In contrast, Appellant’s claim 1 only requires *designing* a location/position for the first static turbine vane, and does not require actually positioning the vane in a gas turbine engine, or any other physical step.

For the above reasons, the recited elements, considered individually and as an ordered combination, do not constitute an “inventive concept” that transforms independent claim 1 into patent-eligible subject matter. *See Alice*, 134 S. Ct. at 2355. Accordingly, we sustain the rejection of claim 1, and of dependent claims 2, 3, and 5, for which Appellant does not present separate arguments (*see* Appeal Br. 4; Reply Br. 1), under 35 U.S.C. § 101 as directed to patent-ineligible subject matter.

Rejection II

First Basis: “most beneficial side” and “more beneficial”

Independent claim 1 recites, in relevant part, “determining whether it would be a most beneficial side to have the hot streak initially impact a pressure side of a first static turbine vane or whether it would be more beneficial to have it impact a suction side.” Appeal Br. 7 (Claims App.). Independent claim 6 similarly recites the term “more beneficial.” *See id.* at 8. The Examiner’s first stated basis for rejecting these claims as indefinite is that “[i]t is not clear what the most beneficial hot streak impact is because the claim limitation is subjective” (Final Act. 6) and, thus, “the metes and

bounds of the claim limitation cannot be determined” (*id.* at 6–7). The Examiner explains that, “[b]ecause there are many variables and conditions to the engine design, not all gas turbine engine designers would agree with each other.” *Id.* at 7. According to the Examiner, “it would be a subjective decision to choose which of the two sides is more beneficial than the other.” Ans. 4. We agree with the Examiner that the limitations in question render the scope of the claims indefinite.

Appellant’s Specification describes that, “when the hot streak 192 is aimed at the pressure side 191, the benefits of the clocking will manifest themselves as a more uniform temperature field entering the second vane row 93” (Spec. ¶ 38), and, “when the hot streak 192 is impacted upon the suction wall 190, the benefit will be a more uniform inlet field to the first stage rotor 90” (*id.* ¶ 39). According to the Specification, “a worker of ordinary skill in the art would recognize when the benefits would be best achieved at the second static turbine vane row 93 as opposed to the first stage rotor 90.” *Id.* ¶ 41. However, the Specification does not provide an objective definition identifying any standard for determining whether a more uniform temperature field would be “most beneficial” or “more beneficial” at second turbine vane row 93 or first stage rotor 90. As such, whether it is “most beneficial” or “more beneficial” to position a turbine vane so that its pressure side or suction side impacts a hot streak appears to be dependent upon the subjective opinion of one of ordinary skill in the art considering the “countless number of variables and computations . . . involved in the design of the gas turbine engine.” *Id.* In the absence of an objective standard in the Specification for determining whether a turbine vane position is “most

beneficial” or “more beneficial,” one of ordinary skill in the art would be unable to ascertain the metes and bounds of the claim.

Accordingly, we sustain the Examiner’s first basis for rejecting claims 1–3 and 5–9 under 35 U.S.C. § 112, second paragraph, as indefinite.

Second Basis: “a more uniform temperature”

Independent claims 1 and 6 recite, in relevant part, “a more uniform temperature.” Appeal Br. 7–8 (Claims App.). The Examiner’s second stated basis for rejecting these claims as indefinite is that the language “more uniform” is subjective. *See* Final Act. 7. Appellant does not present any arguments contesting this basis for rejecting the claims as indefinite. *See* Appeal Br. 5 (presenting arguments only with respect to the first basis, discussed above); Reply Br. 1–2. Consequently, Appellant has waived any argument of error, and we summarily sustain the Examiner’s second basis for rejecting claims 1–3 and 5–9 under 35 U.S.C. § 112, second paragraph. *See In re Berger*, 279 F.3d 975, 984–85 (Fed. Cir. 2002) (holding that the Board did not err in sustaining a rejection under 35 U.S.C. § 112, second paragraph, when the appellant failed to contest the rejection on appeal); *see also* 37 C.F.R. § 41.31(c) (“An appeal, when taken, is presumed to be taken from the rejection of all claims under rejection unless cancelled by an amendment filed by the applicant and entered by the Office.”).

Rejection III

In rejecting claims 1–3 and 5 under 35 U.S.C. § 112, first paragraph, the Examiner finds that “determining whether it would be a most beneficial side to have the hot streak initially impact a pressure side of a first static turbine vane or whether it would be more beneficial to have it impact a

suction side,” as recited in claim 1, lacks adequate written description support.³ *See* Final Act. 5–6. For the reasons discussed above with respect to Rejection II, this limitation renders the claims indefinite because the scope of a static turbine vane position that is “most beneficial” or “more beneficial” is unclear. Given that the meaning of this limitation is required to assess whether they are adequately supported by the original disclosure of the Specification, we cannot reach a determination as to the correctness of the Examiner’s finding that the limitation lacks adequate written description support sufficient to comply with 35 U.S.C. § 112, first paragraph. *Cf. In re Moore*, 439 F.2d 1232, 1235 (CCPA 1971) (One is not in a position to determine whether a claim is enabled under the first paragraph of 35 U.S.C. § 112 until the metes and bounds of that claim are determined under the second paragraph of this section of the statute.).

Accordingly, we do not sustain the rejection of claims 1–3 and 5 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Rejection IV

Having determined that Appellant’s claims are indefinite, for the reasons discussed above, we do not sustain the Examiner’s rejection of

³ We note that the Examiner’s analysis on pages 5–6 of the Final Action appears to be directed to enablement rather than written description. *See* Final Act. 6 (“Applicant’s specification does not give enough *direction* such that a person of ordinary skill would know *how to perform* applicant’s claimed invention” (emphasis added)). Written description and enablement are separate requirements under 35 U.S.C. § 112, first paragraph. *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010).

claims 6–9 under 35 U.S.C. § 102(b) because to do so would require speculation as to the scope of the claims. *See In re Aoyama*, 656 F.3d 1293, 1300 (Fed. Cir. 2011) (holding that the Board erred in affirming an anticipation rejection of indefinite claims). It should be understood, however, that our decision in this regard is based solely on the indefiniteness of the claimed subject matter, and does not reflect on the adequacy of the prior art evidence applied in support of the rejections.

DECISION

The Examiner’s decision rejecting claims 1–3 and 5 under 35 U.S.C. § 101 as directed to patent-ineligible subject matter is AFFIRMED.

The Examiner’s decision rejecting claims 1–3 and 5–9 under 35 U.S.C. § 112, second paragraph, as indefinite is AFFIRMED.

The Examiner’s decision rejecting claims 1–3 and 5 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement is REVERSED.

The Examiner’s decision rejecting claims 6–9 under 35 U.S.C. § 102(b) as anticipated by Dudebout is REVERSED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED