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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PAUL J. DESLAURIERS and DAVID C. ROHLFING¹

Appeal 2016-008670
Application 12/462,713
Technology Center 1600

Before ERIC B. GRIMES, RICHARD J. SMITH, and
TAWEN CHANG, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method to determine a virtual density of a polymer.

We have jurisdiction under 35 U.S.C. § 6(b).

We affirm the rejection under Section 101 and reverse the rejection under Section 103(a).

¹ According to Appellants, the real party in interest is Chevron Phillips Chemical Company LP. (Appeal Br. 3.)

STATEMENT OF THE CASE

Background

Traditionally, in order to determine a value of a desired physical or chemical property, a certain quantity of the particular polymer resin was needed to fabricate an article or a test specimen, and then the resulting article or test specimen was subsequently tested via the prescribed analytical test procedure to determine the value of the property. This procedure is cumbersome not only due to the time required for fabricating, but also the time required to perform the respective analytical test procedure. . . .

Hence, there exists a need for methods of virtually determining a value of a desired polymer property without fabricating samples or performing the analytical test for the physical or chemical property.

(Spec. ¶ 15.)

Claims on Appeal

Claims 1–15, 18, and 19 are on appeal.² (Appeal Br. 18–24 (CLAIMS APPENDIX).) Claim 1 is illustrative and reads as follows (emphasis added):

1. A method to determine a virtual density of a polymer comprising:
 - a) performing at least one instrumented analytical technique to determine the molecular weight distribution profile of the polymer;
 - b) determining a plurality of density values as a function of a Molecular Weight (MW) and Molecular Weight Distribution (MWD) profile of the polymer wherein each of the

² Claims 16 and 17 are cancelled, and claims 20–22 are withdrawn from consideration as directed to a non-elected invention. (Final Action dated July 28, 2015 (“Final Act.”), at 2.)

plurality of density values is determined at a different MW location across the MWD profile;

c) summing the plurality of density values to obtain the virtual density;

wherein the MW and the MWD comprise data obtained as measured properties, data provided as a digitally determined value, data obtained by curve fitting the data obtained as measured properties, data provided as an arbitrarily assigned value or a combination thereof and wherein all polymers having a molecular weight less than 715 g/mol are assigned a density value of 1.006 g/cm³ and wherein steps a, b, c or combinations thereof are performed using a suitably programmed computer associated with a polymerization reactor in real time or stages; and

d) *fabricating an article from the polymer wherein the polymer exhibits a natural draw ratio, Young's modulus, yield strength or a combination thereof within a predicted value.*

Examiner's Rejections

1. Claims 1–15, 18, and 19 stand rejected under 35 U.S.C. § 101 as directed to a judicial exception without additional elements that are sufficient to amount to significantly more than the judicial exception. (Ans. 2–4.)

2. Claims 1–3, 5–7, 9–11, 13, 14, 18, and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over DesLauriers³ and Elias.⁴ (*Id.* at 5–7.)

3. Claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable

³ DesLauriers et al., *Modeling Tie Molecules in Polyethylene* (“DesLauriers”), cited in an Information Disclosure Statement filed in US 2007/0298508 A1, pub. Dec. 27, 2007 (“the ’508 application”).

⁴ Elias, *Polymolecularity and Polydispersity in Molecular Weight Determinations*, PURE APPL. CHEM. 43, 115–47 (1975).

over DesLauriers and Sakaguchi.⁵ (*Id.* at 7–8.)

DISCUSSION

Rejection No. 1

Issue

Whether a preponderance of evidence of record supports the Examiner’s rejection under 35 U.S.C. § 101.

Principles of Law

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.*, 566 U.S. 66, 78–79 (2012)).

Analysis

We adopt the Examiner’s findings, analysis, and conclusions regarding the rejection under Section 101, and discern no error in that rejection. We limit our consideration to claim 1 because the claims were not argued separately.

⁵ Sakaguchi et al., *Physical Properties of Copolymers of Styrene and α -Olefins*, BULL. OF THE INST. FOR CHEM. RES. (Kyoto Univ.) 43, 455–68 (1966).

The Examiner finds that claim 1 is “directed to an abstract algorithmic procedure . . . [and] encompass[es] a purely mathematical series of steps and operation based upon [] molecular weight distribution data.” (Ans. 2.) The Examiner further finds that “the instantly claimed process encompasses a non-statutory algorithmic procedure without involving anything significantly more than a purely computational analysis of polymer molecular weight data.” (*Id.* at 3.) The Examiner notes Appellants’ amendment of claim 1 to recite a step of “fabricating an article” (step (d) italicized above) but finds that “[t]hese limitations do not add anything significantly more to the claim because there is no improvement to either the fabrication procedure or the article [] ultimately being fabricated. . . . applicants’ amendment amounts to nothing more than a recitation of insignificant post solution activity.” (*Id.*)

Appellants contest the rejection by arguing that the “fabricating an article” step (d) qualifies as “significantly more” under the Interim Guidance⁶ as “[e]ffecting a transformation or reduction of a particular article to a different state or thing.” (Appeal Br. 9–11.) In particular, Appellants argue that “[t]he transformation of a polymer into an article utilizing the instantly claimed improved methodologies represents ‘significantly more,’” and that the claims “recite features that include a transformation and constitute ‘significantly more’ than the alleged abstract idea.” (*Id.* at 10–11.)

We find that the Examiner has the better position. Appellants’ argument is directed to the second step of the *Alice* inquiry. In particular, Appellants argue that claim 1 recites “significantly more” than the judicial

⁶ 2014 Interim Guidance on Patent Subject Matter Eligibility, 79 Fed. Reg. 74618, 74624 (Dec. 16, 2014) (“Interim Guidance”).

exception based on the alleged transformation of the polymer, relying on *Diamond v. Diehr*, 450 U.S. 175 (1981).⁷ (Appeal Br. 9–11; *see also* Reply Br. 5–18.) The Court in *Diehr* held that the claimed method for molding raw, uncured rubber into cured, molded products was patent eligible, notwithstanding its use of a known mathematical equation (the Arrhenius equation). *See Diehr*, 450 U.S. at 177.

Here, Appellants are claiming a mathematical algorithm for obtaining (calculating) the virtual density of a polymer and fabricating an article from the polymer, the polymer having certain properties consistent with the calculated virtual density. (Appeal Br. 18.) Unlike the facts in *Diehr*, where raw, uncured rubber was transformed into cured, molded products through a series of steps, claim 1 does not recite a transformation of the polymer. Rather, claim 1 only recites that the same polymer (whose virtual density has been determined) is used to fabricate an article. Stated another way, the polymer used to fabricate the article is the same polymer whose virtual density has been determined, and claim 1 recites nothing about a transformation of the polymer.⁸ (*See* Ans. 8.) In fact, Appellants

⁷ The “transformation” quote from the Interim Guidance relied on by Appellants cites to *Diehr*, and Example 25 of the July 2015 Update Appendix 1: Examples cited by Appellants in the Reply Brief is based on *Diehr*. (Appeal Br. 10; Reply Br. 6–7, citing July 2015 Update Appendix 1: Examples, available at <https://www.uspto.gov/sites/default/files/documents/ieg-july-2015-update.pdf>.)

⁸ We acknowledge Appellants’ comparison of claim 1 at issue in *Diehr* and Appellants’ claims 1–5, argued for the first time in the Reply Brief. (Reply Br. 11–18.) We are not persuaded, at least because the claimed method at issue in *Diehr* was directed to a method for molding raw, uncured rubber

acknowledge that the “predicted value” of the properties of the polymer used to fabricate an article (step (d)) is based on the calculated virtual density. (Reply Br. 16–17, citing Spec. ¶¶ 178, 180–182.)

Appellants also take issue with the Examiner’s statement that “[t]he claims recite only the generic, unaltered act of ‘fabricating’ . . . the scope of the claim[s] necessarily encompasses unmodified fabricating methods already routine and congenitally [sic, conventionally] applied in the art.” (Ans. 8.) Appellants argue that “the Examiner provides no citations to case law to establish that courts have recognized, or those in the field of polymerization would recognize, that fabricating an article from the polymer is well-understood, routine, and conventional in the field.” (Reply Br. 8.)

We are not persuaded. The law is clear that “simply appending conventional steps, specified at a high level of generality, to . . . abstract ideas cannot make those . . . ideas patentable.” *Mayo*, 566 U.S. at 82. Moreover, Appellants acknowledge the traditional step of fabricating an article from a polymer (Spec. ¶ 15), and claim 1 does not recite any aspect of the fabricating step that is other than a traditional or conventional step, recited at a high level of generality.

We also agree with the Examiner that Appellants’ added “fabricating” step is insignificant post-solution activity, and further find such step to be a mere instruction to “apply” the abstract idea or mathematical calculation, which is not sufficient to transform the nature of the claim into a patent-eligible application. *See Mayo*, 566 U.S. at 77–80; *see also Diehr*, 450 U.S. 191–92 (“insignificant post-solution activity will not transform an

into cured, molded products (i.e. transformation of raw, uncured rubber), and Appellants’ claim 1 does not recite a transformation of the polymer.

unpatentable principle into a patentable process”); *Parker v. Flook*, 437 U.S. 584, 590 (1978) (“The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula”); *Two-Way Media Ltd. v. Comcast Cable Comms., LLC*, 874 F.3d 1329, 1338 (Fed. Cir. 2017) (“Merely . . . adding the words ‘apply it with a computer’ cannot convert a patent-ineligible abstract idea into a patent-eligible invention.”).

Accordingly, for the reasons of record and as set forth above, we affirm the Examiner’s rejection of claim 1 under 35 U.S.C. § 101. Claims 2–15, 18, and 19 were not argued separately and fall with claim 1.

Rejection Nos. 2 and 3

Issue

Whether a preponderance of evidence of record supports the Examiner’s rejections under pre-AIA 35 U.S.C. § 103(a).

Principles of Law

“Because there are many ways in which a reference may be disseminated to the interested public, ‘public accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’ bar under 35 U.S.C. § 102(b).” *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986). “Whether a reference qualifies as a printed publication is a legal conclusion based on underlying factual determinations.” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016).

Discussion

The Examiner contends that DesLauriers “was made available” in an Information Disclosure Statement of the ’508 application (*see* n.3), and was publicly available on December 27, 2007, when the ’508 application was published. (Ans. 9; *see also* Non-Final Action dated July 16, 2014, at 9 (“DesLauriers [] qualifies as prior art under 35 USC 102(b).”)) Appellants contest the Examiner’s reliance on DesLauriers as a prior art printed publication for purposes of the obviousness rejections. (Appeal Br. 11–16.)

Based on the facts and circumstances of the present case, and for the reasons set forth below, we conclude that DesLauriers was not publicly accessible as of December 27, 2007, so as to qualify as a prior art printed publication as of that date.

Findings of Fact

FF 1. DesLauriers was cited in an Information Disclosure Statement that was filed in the ’508 application on January 26, 2007. (Information Disclosure Statement dated Jan. 26, 2007 (“IDS”).) The IDS cited DesLauriers by listing “DESLAURIER[sic, S], et al, ‘Modeling Tie Molecules in Polyethylene,’” and that citation was among a group of twenty items of non-patent literature (NPL) that were cited. (*Id.* (Cite No. BR, Sheet 3 of 3).)

FF 2. Upon publication of the ’508 application on December 27, 2007, the IDS became available through public PAIR (Patent Application Information Retrieval). *See* MPEP § 1730(II)B(1)d.

FF 3. DesLauriers was not mentioned, as a cited reference or otherwise, in the ’508 application as published on December 27, 2007. (Appeal Br. 12.)

FF 4. As non-patent literature, DesLauriers was not accessible on public PAIR upon publication of the '508 application. Access to a copy of DesLauriers was limited to those persons having access to the '508 application through private PAIR⁹ or obtaining a copy directly from the Patent and Trademark Office. *See* MPEP § 1730(II)B(1)d (“Non-patent literature (NPL) may be viewed using private PAIR (if an [image file wrapper] file has been created) or obtained from the USPTO Office of Public Records”).

Analysis

The law regarding “public accessibility” of a printed publication has developed a framework that generally looks at whether there is a “roadmap” from an accessible document or item to the potentially invalidating reference. *See Blue Calypso*, 815 F.3d at 1347–50 (discussing cases). As stated in *Blue Calypso*, “[a]n adequate roadmap need not give turn-by-turn directions, but should at least provide enough details from which we can determine that an interested party is reasonably certain to arrive at the destination: the potentially invalidating reference.” *Id.* at 1350.

The facts of the present case are similar to those arising in the context of references stored in libraries, with the Patent and Trademark Office essentially serving as the library. In *Hall*, 781 F.2d at 899–900, our

⁹ Access to the contents of a pending patent application through private PAIR is limited to a registered patent attorney/agent (or Independent Inventor) associated with that patent application through a Customer Number. *See* https://www.uspto.gov/sites/default/files/patents/process/status/private_pair/PrivPairOverview_Oct09.pdf.

reviewing court found that a dissertation was publicly accessible because it was shelved and indexed in a card catalog at a German university. *Id.* In contrast, our reviewing court found in *In re Cronyn*, 890 F.2d 1158, 1161 (Fed. Cir. 1989), that three undergraduate theses were not publicly accessible because they were indexed only by title and author's name, rather than by subject, and thus not cataloged or indexed in a meaningful way. *Id.*

Here, as of December 27, 2007, the file corresponding to the '508 application included the IDS that listed, among other references, "DESLAURIER, et al, 'Modeling Tie Molecules in Polyethylene.'" No other information was provided regarding DesLauriers. As such, even if we were to consider the '508 application as a form of index, only the author's name and the title of the publication are listed. Thus, the facts in the present case are similar to the facts in *Cronyn*, and we do not find that a listing by author's name and title in the IDS, among other cited references, is a sufficient roadmap so as to lead an interested party to DesLauriers. *See Blue Calypso*, 815 F.3d at 1349 ("[i]ndexing only by title and author's name did not amount to the references [in *Cronyn*] being 'either cataloged or indexed in a meaningful way.'") (citing *Cronyn*, 890 F.2d at 1161).

Accordingly, because we conclude that DesLauriers was not publicly accessible so as to permit its use as a prior art printed publication as of December 27, 2007, and because the Examiner's obviousness rejections rely on DesLauriers as a prior art printed publication as of that date, we reverse the rejections of claims 1–3, 5–7, 9–14, 18, and 19 under 35 U.S.C. § 103(a).

Conclusions

A preponderance of evidence of record supports the Examiner's rejection of claims 1–15, 18, and 19 under 35 U.S.C. § 101.

A preponderance of evidence of record fails to support the Examiner's rejections of claims 1–3, 5–7, 9–14, 18, and 19 under 35 U.S.C. § 103(a).

SUMMARY

We affirm the rejection under Section 101 and reverse the rejections under Section 103(a).

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