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Workman Nydegger
60 East South Temple
Suite 1000
Salt Lake City, UT 84111

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DINH, LYNDA

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte STEPHEN JAMES PURVES, ADAM JOHN ECKERSLEY, and NICHOLAS McARDLE

Appeal 2018-008665
Application 14/900,096
Technology Center 2800

Before MICHAEL P. COLAIANNI, JAMES C. HOUSEL, and JEFFREY R. SNAY, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

Appellant[2] appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–10, 14–16, 18–28, and 30 under 35 U.S.C. § 101 as being directed to patent ineligible subject matter. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] Our decision refers to the Specification ("Spec.") filed December 18, 2015, the Examiner's Non-Final Office Action ("Non-Final") dated September 7, 2017, Appellant's Appeal Brief ("Appeal Br.") filed April 6, 2018, the Examiner's Answer ("Ans.") dated July 23, 2018, and Appellant's Reply Brief ("Reply Br.") filed September 5, 2018.

[2] Appellant is the Applicant, Foster Findlay Associates Limited, which is identified in the Appeal Brief as the real party in interest (Appeal Br. 2).

STATEMENT OF THE CASE

The invention relates to a method for enhancing visualization of geologic features in 3D seismic survey data using high definition frequency decomposition (Spec. 1, Title). Appellant discloses that geologic data surveys such as seismic prospecting are commonly used to aid in the search and evaluation of subterranean hydrocarbon deposits (*id.* at 1:14–16). As an example, Appellant discloses reflected seismic signals from subsurface features are detected and recorded by an array of seismic receivers (*id.* at 1:19–23). According to Appellant, the success of a prospecting operation depends on successful completion of this data acquisition, as well as data processing and data interpretation (*id.* at 1:16–19). Various computational approaches have been utilized to extract information from the seismic data including spectral decomposition, Fourier Transform, time-frequency analysis, frequency decomposition with filter banks, and adaptive scale space analysis (*id.* at 2:15–8:24). Appellant discloses that the inventive method improves seismic interpretation using High Definition Frequency Decomposition (HDFD) (*id.* at 8:26–29).

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal:

1. A method, implemented at a computer system that includes one or more processors, for visually enhancing at least one geological feature in 3D seismic survey data detected by an array of seismic receivers proximate an area of the substrata to be evaluated, comprising the steps of:

(a) receiving 3D seismic survey data detected by the array of seismic receivers;

(b) selecting at least one first seismic trace from a 3D seismic survey dataset compiled from the received 3D seismic survey data;

(c) subdividing said at least one first seismic trace into a plurality of identified characteristic segments;

(d) generating at least one first analytical model function for each of said plurality of identified characteristic segments, utilizing at least one adapted wavelet from an existing dictionary;

(e) determining a minimized residual trace energy function based on a predetermined threshold between said at least one first seismic trace and said at least one first analytical model function;

(f) optimizing said at least one first analytical model function with respect to said minimized residual trace energy function;

(g) repeating steps (e) and (f) until a predetermined condition is met, and

(h) generating a model dataset from said optimized at least one first analytical model function for at least part of said at least one first seismic trace for visual representation,

wherein said predetermined condition in step (g) is any one of a minimum of the trace energy overestimate between said at least one first seismic trace and said at least one first analytical model function, or a joint minimum of the trace residual energy and the trace energy overestimate between said at least one first seismic trace and said at least one first analytical model function.

Claim 30 recites a computer program product comprising hardware storage devices having stored computer-executable instructions executable by computer system processors to perform the method of claim 1.

ANALYSIS

Claims 1–10, 14–16, 18–28, and 30 are rejected under 35 U.S.C. § 101 as being directed to patent ineligible subject matter.

Appellant argues the following groups of claims separately from claim 1: claims 4 and 5; claim 8; claims 23 and 24; claim 27; and claim 28.

Because they are not argued separately, claims 2, 3, 6, 7, 9, 10, 14–16, 18–22, 25, 26, and 30 stand or fall with claim 1.

We review the appealed rejection for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) *cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) ("[I]t has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections."). After considering the argued claims relative to case law presented in this Appeal and each of Appellant's arguments, we are not persuaded that Appellant identifies reversible error. Thus, we affirm the Examiner's rejection for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement

risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); "tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores" (*id.* at 184 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 176; *see also id.* at 192 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*); *see, e.g.*, *id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula

to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (citation omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The PTO recently published revised guidance on the application of § 101. USPTO's 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Memorandum"). Under that guidance, we first look to whether the claim recites:

> (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human interactions such as a fundamental economic practice, or mental processes); and
>
> (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h) (9th ed. 2018).
>
> Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that are not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Memorandum 52, 55–56.

Claim 1

Here, the Examiner finds claim 1 is directed to the abstract idea of collecting and analyzing information or of mathematical concepts (Non-Final 6–7). The Examiner finds that the steps of receiving 3D seismic survey data, selecting a first seismic trace, subdividing the first seismic trace, generating a first analytical model function, determining a minimized residual trace energy function, optimizing the first analytical model function, repeating steps, and generating a model dataset for visual representation are similar to collecting and analyzing information as discussed in *Elec. Power Grp.*, 830 F.3d 1350 (Fed. Cir. 2016) (Non-Final 6). Further, the Examiner finds the first analytical model function is a mathematical algorithm (*id.* at 7). In addition, the Examiner finds that the additional steps of selecting a first seismic trace and repeating steps are well-understood and routine in the relevant field of art (*id.*). The Examiner also finds the processor is a well-known and generic computer component which performs generic functions, and as such, does not amount to significantly more than the abstract idea (*id.*).

Appellant argues that the Examiner has failed to establish that the claims are directed to a patent-ineligible concept, though the Examiner

names two particular abstract ideas identified by the courts, i.e., "the abstract idea of 'collecting information and analyzing it,'" and "performing mathematical correlations" (Appeal Br. 7). Appellant contends that the Examiner fails to explain why or how the claims fall into one or both of these cited abstract ideas (*id.*). Moreover, Appellant contends that the Examiner fails to compare their claims with claims already found to be ineligible (*id.*). Appellant also contends that the Examiner fails to properly consider claim 1 as a whole in finding that this claim is directed to an abstract idea (*id.* at 8, citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Appellant argues that, by excluding recited limitations and specifically referring to only a subset of the claim limitations for consideration in the patent-eligibility determination, the Examiner fails to consider claim 1 as a whole (*id.*).

In addition, Appellant argues that the Examiner errs by identifying that the claims are directed either to collecting and analyzing information or to performing mathematical correlations in the alternative (Appeal Br. 8). Appellant urges that it is a logical inconsistency that a single claim can be directed to separate, unrelated concepts if the limitations are truly considered as a whole (*id.*). Appellant asserts that the thrust of a claim, i.e., what the claim is directed to, should be a unified concept, rather than "a menu of unrelated options" (*id.*).

The claims of *Electric Power Group* were directed to systems and methods for performing real-time performance monitoring of an electric power grid by collecting data from multiple sources, analyzing the data, and displaying the results. *Elec. Power Grp.*, 830 F.3d at 1351–1352. The Federal Circuit noted that collecting information has been treated as within

the realm of abstract ideas, "analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category," and "merely presenting the results of abstract processes of collecting and analyzing information, without more" is abstract and thus the claims focused on the combination of these abstract ideas. *Id.* at 1353–1354. The Federal Circuit has summarized such a situation in this way:

> We have explained that claims focused on "collecting information, analyzing it, and displaying certain results of the collection and analysis" are directed to an abstract idea. *Electric Power*, 830 F.3d at 1353. "Information as such is an intangible," hence abstract, and "collecting information, including when limited to particular content (which does not change its character as information), [i]s within the realm of abstract ideas." *Id.* (citing cases). So, too, is "analyzing information ... by mathematical algorithms, without more." *Id.* at 1354 (citing cases, including *Parker v. Flook*, 437 U.S. 584, 98 S. Ct. 2522, 57 L.Ed.2d 451 (1978), and *Gottschalk v. Benson*, 409 U.S. 63, 93 S. Ct. 253, 34 L.Ed.2d 273 (1972)). And "merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis." *Id.* (citing cases). The claims here are directed [to] abstract ideas under those principles.

SAP Am., Inc. v. Investpic, LLC, 898 F.3d 1161, 1167 (Fed. Cir. 2018).

Like the claims in *Electric Power Group* and *SAP America*, "[t]he claims in this case are directed to abstract ideas. The focus of the claims, as is plain from their terms, quoted above, is on selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis. That is all abstract." *SAP Am.*, 898 F.3d at 1167. Thus, claim 1 recites mental processes and mathematical concepts. In

accordance with the PTO's policy guidance, step (1), we identify claim 1 as being directed to and reciting a judicial exception—mathematical concepts that are an abstract idea. In particular, steps (c)–(h) recite a mathematical algorithm for processing 3D seismic survey data by: (c) subdividing that data into a plurality of segments; (d) generating first analytical model functions for each of the segments; (e) determining minimized residual trace functions based on a predetermined threshold between the subdivided data and the first analytical model function; (f) optimizing the first analytical model function with respect to the minimized residual trace energy function; (g) repeating steps (e) and (f); and (h) generating a model dataset from the optimized first analytical model functions for visual representation. We note Appellant describes such processing as a computational approach to seismic interpretation using a High Definition Frequency Decomposition (HDFD) algorithm (Spec. 2:17–18, 8:26–29, 9:31–10:2).

Appellant also argues that the claims address a real-world problem (Appeal Br. 9). In particular, Appellant asserts the following: 1) that prospecting in the oil and gas industry typically relies on models formed from geological survey data to aid in the search for and evaluation of hydrocarbon deposits; 2) that hydrocarbon prospecting is directly linked to hydrocarbon harvesting; 3) to conserve time and resources, the models attempt to reconstruct the geological aspects of each deposit, thereby enabling accurate estimation of resource cost to mine a respective deposit (*id.*). Based on these assertions, Appellant urges that the efficiencies of the models are directly linked to efficiencies gained/lost during the harvesting phase (*id.*). According to Appellant, current models are often inaccurate and resource intensive to implement, such that they negatively affect production

efficiency (*id.* at 9–10). Therefore, the problem which the claimed methods address is a real-world problem (*id.* at 10).

Appellant also contends that the claimed methods address this problem in a significantly faster way than prior art techniques and covers the whole seismic dataset in a relatively small and tractable manner for storage (Appeal Br. 10). Appellant asserts that the claimed methods, therefore, "can positively impact the identification and selection of hydrocarbon deposits and increase downstream recovery efficiency," as well as "reduce the resources and time involved in prospecting and harvesting hydrocarbons" (*id.*). As such, Appellant urges that claim 1 "goes well beyond merely 'collecting information and analyzing it" (*id.*).

These arguments relate to step (2) of the Memorandum.[3] Here, we must determine if the claims provide additional elements that integrate the judicial exception, the mathematical concepts or HDFD algorithm, into a practical application. Appellant's arguments implicate MPEP 2106.05(a), Improvements to the Functioning of a Computer or To Any Other Technology or Technical Field.[4] However, here the claims do not integrate the judicial exception into a practical application. Although Appellant argues that the claims address a real-world problem, the claims fail to recite additional elements which tie the judicial exception to any difference in the prospecting phase or the harvesting phase of geological hydrocarbon

[3] We acknowledge that some of these considerations may be properly evaluated under Step 2 of *Alice* (Step 2B of Office guidance). Solely for purposes of maintaining consistent treatment within the Office, we evaluate it under Step 1 of *Alice* (Step 2A of Office guidance). *See* Memorandum.
[4] Appellant's arguments fail to implicate any of MPEP 2106.05(b), (c), or (e), nor do we find any claim limitation falling into one of these sections.

production. Claim 1 is broadly directed to a computer implemented method for visually enhancing at least one geological feature in 3D seismic survey data and merely results in the generation of a model dataset for at least one seismic trace. Claim 1 does not require any particular use of the resulting model dataset, and indeed does not even require that the model dataset is displayed in any particular manner for visual presentation. Thus, claim 1 does not provide additional elements which result in an improvement to any technology or technical field.

Further, Appellant does not contend, nor does claim 1 result in, an improvement to the functioning of a computer per se. Appellant's contentions that the method addresses the problem of analyzing 3D seismic survey data in a significantly faster way than prior art techniques and covers the whole seismic dataset in a relatively small and tractable manner for storage are not improvements in the functioning of the computer, but merely improvements in the mathematical processing of the 3D seismic survey data.

Appellant next argues that, even if the claims are directed to patent ineligible subject matter, they nonetheless pass the second step of the Alice/Mayo inquiry (Appeal Br. 10–11). Appellant alleges that the Examiner erred in concluding that the claims tend to monopolize the abstract idea itself rather than being a particular limited application of the abstract idea which serves to improve a specific method or device (*id.* at 11). According to Appellant, claim 1 is "directed to a particular limited application and serves to improve a specific method—visually enhancing geologic features in 3D seismic survey data" (*id.*). Appellant further asserts that "the specificity of the claim limitations, considered individually and 'as an ordered combination' clearly demonstrate that the claim would not tend

to monopolize or preempt methods for visually enhancing geologic features in 3D seismic survey data" (*id.*). Appellant also argues that the Examiner ignored the last limitation of claim 1, which limitation transforms the claims into something significantly more than an abstract idea (*id.*).

Appellant's arguments are not persuasive that the claims recite additional limitations beyond what was well-known, routine, and conventional in the art sufficient to transform the judicial exception into a patent-eligible application. With regard to steps (3) and (4) of the PTO's policy guidance, the Examiner identified the computer processor as a well-known and generic computer component which performs generic functions, and as such, does not amount to significantly more than the abstract idea (Non-Final 7). Appellant does not challenge this finding. As to the "wherein" clause at the end of claim 1, this limitation defines the end of the repetition step (g) of the HDFD algorithm recited in the claim. Such a limitation does nothing more than defining a constant in a mathematical equation and cannot alone, or in an ordered combination of other features of the claim, transform the claimed method into significantly more than the abstract idea.

Moreover, although Appellant contends that the claims are directed to a particular limited application and serve to improve a specific method—visually enhancing geologic features in 3D seismic survey data, as noted above—claim 1 does not even require that the result of the method, a model dataset, is displayed in any particular manner for visual presentation, much less that the model dataset is used in a manner so as to change how a hydrocarbon deposit is prospected and/or harvested. Absent such, we cannot

say that any additional features beyond the judicial exception transform that exception into a patent-eligible application.

In the Reply Brief, Appellant argues that the Examiner overgeneralizes claim 1, thereby allowing the Examiner to shoe-horn the claim into snippets of court holdings (Reply Br. 3–4). Appellant urges that the present claims enable a computer to do things it could not do before (*id.* at 5–6, citing *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018)). In addition, Appellant urges that claim 1 is directed to unconventional rules with specific characteristics, referring specifically again to the final "wherein" clause (*id.* at 6, citing *McRO, Inc. v. Bandai Namco Games Am., Inc.*, 837 F.3d 1299 (Fed. Cir. 2016)).

We are not persuaded that claim 1 enables a computer to perform differently than it could before. In *Finjan*, the claims were directed to identifying and protecting a computer against malware which the court found to constitute sufficient non-abstract improvement in computer functionality to render the claims patent eligible (*Finjan*, 879 F.3d at 1304–1305). As indicated above, claim 1 merely applies a mathematical algorithm to be performed by a computer. The algorithm does not improve the functionality of the computer as in *Finjan*.

In *McRO*, the Federal Circuit disagreed with a district court's determination that claims were "drawn to the [abstract] idea of automated rules-based use of morph targets and delta sets for lip-synchronized three-dimensional animation." *McRO*, 837 F.3d at 1313 (quoting *Patentability Op.*, 55 F. Supp. 3d 1214, 1226 (C.D. Cal. 2014)). Instead, the Federal Circuit determined that "the claims are limited to rules with specific characteristics." *Id.* More specifically, the Federal Circuit stated:

> [a]s the district court recognized during claim construction, "the claims themselves set out meaningful requirements for the first set of rules: they 'define[ ] a morph weight set stream as a function of phoneme sequence and times associated with said phoneme sequence.'"

Id. The Federal Circuit determined "[t]he specific, claimed features of these rules allow for the improvement realized by the invention." *Id.* Moreover, the Federal Circuit recently stated: "[o]ur recent abstract idea exception decisions likewise have stressed that a claimed invention must embody a concrete solution to a problem having 'the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it.'" *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1343 (Fed. Cir. 2018) (citing *SAP Am., Inc.*, 890 F.3d at 1021–22 (collecting cases)).

A comparison of claim 1 to claim 1 of *McRO* demonstrates substantial differences between the facts of this appeal and the facts of *McRO*. Claim 1 of *McRO* recites a method for automatically animating lip synchronization and facial expression of 3-D characters comprising, among other things, "obtaining a first set of rules that define output morph weight set stream as a function of phoneme sequence and time of said phoneme sequence." *McRO*, 837 F.3d at 1307–1308. As noted above, the Federal Circuit determined "the claims are limited to rules with specific characteristics." *Id.* at 1313.

In contrast, Appellant's claim 1 does not recite any rules with specific characteristics. Although mathematical relationships and algorithms are implicated in the recitations of claim 1, this claim does not actually recite any particular rules. Claim 1 generally recites receiving 3D seismic survey data, selecting a first seismic trace, subdividing the trace into plural segments, generating a first analytical model function for each segment

using an adapted wavelet from an existing dictionary, determining a minimized residual trace energy function based on a threshold between the trace and the analytical model function, optimizing the model function with respect to the minimized residual trace energy function, repeating the determination and optimizing steps until a predetermined condition is met. Such a level of generality does not limit the claims to rules with specific characteristics, as in *McRO*.

Moreover, to the extent Appellant asserts the claims are distinguishable from the claims of other cases, such as *Alice*, due to a lack of applied prior art, we note that the mere fact an abstract idea is novel or non-obvious does not render the subject matter eligible under § 101. In response to an argument that a claim contained an inventive concept because it was not shown to be anticipated under § 102 or obvious under § 103, the Federal Circuit has stated:

> [t]hat position misstates the law. It is true that "the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap." *Mayo*, 132 S. Ct. at 1304. But, a claim for a *new* abstract idea is still an abstract idea. The search for a § 101 inventive concept is thus distinct from demonstrating § 102 novelty.

Synopsys, Inc. v. Mentor Graphics Corp., 839 F.3d 1138, 1151 (Fed. Cir. 2016).

Accordingly, claims 1– 3, 6, 7, 9, 10, 14–16, 18–22, 25, 26, and 30 are directed to patent ineligible subject matter under 35 U.S.C. § 101.

Claims 4, 5, 8, 23, 24, 27, and 28

Even though Appellant separately argues these claims, we treat them together because Appellant's argument is the same for each claim.

Claims 4 and 5 each depend from claim 3, which requires that the characteristic segments are identified salient events of the analytic trace envelope function used for subdividing the first seismic trace. Claim 4 further requires that the salient events are characteristic peaks of the analytic trace envelope function. Claim 5 further requires that the salient events are intervals contained between pairs of troughs of the trace envelope function.

Claim 8 depends from claim 7, and further requires that the minimized residual trace energy function in step (e) is determined from a residual trace signal between the first seismic trace and the first analytical model function, wherein the first analytical model function is optimized so as to minimize a residual energy function with the first seismic trace.

Claims 23, 24, and 28 depend from claim 22, which requires that step (c) includes the step of subdividing the first seismic trace into a plurality of band-limited frequency sections in addition to the plurality of identified characteristic segments. Claim 23 further requires that each of the plurality of band-limited frequency sections is defined by a predetermined lower and upper frequency limit, different from the predetermined lower and upper frequency limit of any other of the plurality of band-limited frequency sections. Claim 24 further requires that each of the plurality of band-limited frequency sections is defined by a lower and upper frequency limit derived from a predetermined peak power of a frequency power spectrum over a predetermined time period, wherein the upper frequency limit is at the uppermost frequency of the predetermined peak power and the lower frequency limit is at the lowermost frequency of the predetermined peak power. Claim 28 further requires that the existing dictionary in step (d) is extended by at least one octave above an uppermost frequency limit and at

least one octave below a lowermost frequency limit of the plurality of band-limited frequency sections.

Claim 27 depends from claim 26, which requires that each of the plurality of band-limited frequency sections is defined by a lower and upper frequency limit derived from the cumulative power distribution of the first seismic trace. Claim 27 further requires that the existing dictionary in step (d) is extended by at least one octave above an uppermost frequency limit and at least one octave below a lowermost frequency limit of the plurality of band-limited frequency sections.

Appellant argues that "[n]owhere has the Examiner established that [these] limitation[s] [are] taught in any of the art cited by the Examiner. Therefore, the Examiner has not established that [these] limitation[s] [are] 'routine' or 'conventional' activity in this field" (Appeal Br. 12–14). Appellant contends these limitations transform the claims into something significantly more than an abstract idea (*id.*).

We disagree. Initially, we note that the Examiner identified each of the limitations of these claims as part of the abstract idea (Non-Final 7–8). Appellant fails to address these findings. As above with regard to the final "wherein" clause of claim 1, these claims merely define the parameters that are used in performing the mathematical algorithm defined in claim 1. Because they are properly considered part of the abstract idea, the Examiner need not establish that they are well-known, routine, and conventional in the art. Such limitations do not serve to transform an otherwise patent-ineligible claim into one that is patent eligible.

DECISION

Upon consideration of the record, and for the reasons given above and in the Non-Final Office Action and the Examiner's Answer, the decision of the Examiner rejecting claims 1–10, 14–16, 18–28, and 30 under 35 U.S.C. § 101 as directed to patent ineligible subject matter is *affirmed*.

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

AFFIRMED