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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GEOFFREY A. DORN,
WILLIAM S. HAMMON III, and
JAMES A. CARLSON¹

Appeal 2017-005714
Application 13/300,949²
Technology Center 2800

Before JEFFREY T. SMITH, MONTÉ T. SQUIRE, and
MICHAEL G. McMANUS, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1 and 157–175. We have jurisdiction under 35 U.S.C. § 6.

Appellants' invention relates generally to computer-aided, semi-automatic and automatic interpretation of depositional systems. (Spec. ¶ 2). Claim 1 illustrates the subject matter on appeal and is reproduced from the Claims Appendix to the principal Brief.

¹ These are the names of the identified inventors of the appealed application.

² According to the Appeal Brief, the real party in interest is CGG JASON (NETHERLANDS) B.V. (*See App. Br. 2*).

1. A method for assisting with identifying a structure within a volume, the method comprising:

performing a structural interpretation of a three-dimensional seismic volume to obtain an interpreted structure;

transforming, by one or more computers and using a three-dimensional transformation, the three-dimensional seismic volume and the interpreted structure into a stratal-slice volume;

performing a stratigraphic interpretation, the stratigraphic interpretation comprising:

calculating at least one stratigraphic attribute volume in the stratal-slice volume;

imaging a three-dimensional element of a depositional system using the at least one stratigraphic attribute volume; and

imaging a connected, closed bounding surface that entirely surrounds the three-dimensional element of the depositional system; and

transforming both the at least one stratigraphic attribute volume and the bounding surface into the spatial domain.

REJECTIONS AT ISSUE

The Examiner maintains the following rejections:

I. Claims 1 and 157–175 rejected under 35 U.S.C. § 101 for being directed to non-statutory subject matter. (Final Act. 2).

II. Claims 1 and 157–166 rejected under 35 U.S.C. § 102(b) as anticipated by Crawford (US 5,987,388, issued Nov. 16, 1999 (Crawford)). (Final Act. 3–5).

III. Claims 161 and 171 rejected under 35 U.S.C. § 103(a) as obvious over the combination of Crawford and *Stratal Slicing, Part II: Real 3-D Seismic Data*, 63 *Geophysics* 514 (1998) (Zeng). (Final Act. 5–6).

OPINION

We have reviewed Appellants' arguments in the Brief, the Examiner's rejections, and the Examiner's response to Appellants' arguments. Appellants' arguments have not persuaded us of error in the Examiner's determination that the claims recite non-statutory subject matter.

Rejection I³

The Supreme Court reiterated the framework set out in *Mayo Collaborative Services, v. Prometheus Labs., Inc.*, 132 S.Ct. 1289 (2012), for “distinguishing patents that claim . . . abstract ideas from those that claim patent-eligible applications of those concepts.” *Alice Corp. Pty. Ltd., v. CLS Bank International*, 134 S.Ct. 2347, 2355 (2014). Assuming that a claim nominally falls within one of the statutory categories of machine, manufacture, process, or composition of matter, the first step in the analysis is to determine if the claim is directed to a law of nature, a natural phenomenon, or an abstract idea (judicial exceptions). If so, the second step is to determine whether any element or combination of elements in the claim is sufficient to transform the nature of the claim into a patent eligible application, that is, to ensure that the claim amounts to significantly more than the judicial exception.

³ Appellants present arguments for independent claim 1. (App. Br. 4–21). Appellants do not present separate substantive arguments that sufficiently address independent claim 166 or dependent claims 157–165 and 167–175. (*See generally* App. Br.). Our analysis applies to all the independent claims and we limit our discussion to independent claim 1, which we select as representative of the rejected claims.

Appellants argue the Examiner has not provided sufficient showing that the claimed invention is similar to at least one concept recognized in the case law as an abstract idea and therefore has not met the burden of establishing that the claims are ineligible subject matter and. (App Br. 6–11).

Appellants’ arguments are not persuasive of reversible error in the Examiner’s rejection because the initial arguments presented in the principal Brief, are premised on the guidance provided in the May 4, 2016 Memorandum to the Examining Corps, which was issued after the February 24, 2016 Final Action from which this appeal arises.

Appellants argue a proper analysis, under the *Alice/Mayo* analysis, and of the claimed invention shows that the claimed invention is not directed to a judicial exception and even if taken as directed to a judicial exception amounts to significantly more than the judicial exception itself. (App Br. 12–21).

Appellants argue the claimed invention meets the first prong of the *Alice/Mayo* analysis because the claimed invention recites specific elements that are used to generate improved stratigraphic features and provide improved recognition and interpretation of depositional features. Appellants specifically argue

The method of claim 1 identifies and interprets depositional environments, depositional systems and elements of depositional systems from 3-D seismic volumes such that noise in the seismic volume after acquisition and seismic processing is removed or minimized at each step in the work flow. (App Br. 15).

Appellants conclude the claimed invention recites specific elements that are used to generate improved stratigraphic features and provide

improved recognition and interpretation of depositional features. (App Br. 17).

The Examiner finds that claim 1 is directed to a method for assisting with identifying a structure within a volume comprising performing structural or stratigraphic interpretation, calculating a volume and transforming data into a stratal-slice volume, are the same as basic mathematical calculation functions routinely provided by a general purpose computer. (Final Act. 2; Ans. 3–4). The Examiner further determines the additional element of imaging a three-dimensional element as required by the claimed invention is an insignificant extra solution activity using conventional equipment. (Final Act. 6). As such, the Examiner determines the claimed invention does not include additional elements that are sufficient to amount to significantly more than the judicial exception. Specifically, the Examiner finds the claimed invention does not go beyond collecting data and performing analysis using abstract ideas on a processor. (Final Act. 7; Ans. 3).

We concur with the Examiner that independent claim 1 is directed to data collection and implementation of abstract ideas on a processor. The Federal Circuit has explained that, in determining whether claims are patent-eligible under Section 101, “the decisional mechanism courts now apply is to examine earlier cases in which a similar or parallel descriptive nature can be seen—what prior cases were about, and which way they were decided.” *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1294 (Fed. Cir. 2016). The Federal Circuit also noted in that decision that “examiners are to continue to determine if the claim recites (i.e., sets forth or describes) a concept that is similar to concepts previously found abstract by the courts.”

Amdocs, 841 F.3d at 1294 n.2 (citation omitted). Our reviewing court has said that “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.” *Elec. Power Grp. LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (claims reciting the combination of the abstract-idea processes of gathering and analyzing information of a specified content and then displaying the results, without any particular assertedly inventive technology for performing those functions, are directed to an abstract idea); *id.* at 1354 (treating “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.”).

Claim 1 recites: interpreting data (three-dimensional seismic data to obtain an interpreted structure), transforming the interpreted structure (utilizing a computer to create the stratal-slice volume), performing stratigraphic interpretation comprising: calculating at least one stratigraphic attribute volume; utilizing the stratigraphic attribute volume to image a three-dimensional element of the depositional system; and transforming both at least one stratigraphic attribute volume and the bounding surface into the spatial domain. We consider claim 1 to be directed to an abstract concept of collecting and analyzing data similar to that held to be abstract in *Elect. Power Grp.*

While Appellants argue the claimed invention improves the monitoring and seismic imaging of actual target subsurface formations and is more than merely transforming seismic data from one form to another.

(App. Br. 15–17), the language of the independent claim 1 does not recite any step of identifying the actual location of a structure within a volume.

With respect to the second step of the *Alice* analysis, Appellants argue the claimed invention is an improvement in the field of seismic imaging and identifying stratigraphic features, providing improved recognition and interpretation of depositional features. (App. Br. 17). As such, Appellants assert the limitations are directed to significantly more than an abstract concept. (App. Br. 17–18). Appellants argue that their invention improves the technology and can be analogized to the *Diamond v. Diehr*, 450 U.S. 175 (1981) and *Research Corporation Technologies Inc. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010) (App. Br. 18–19).

The Examiner finds that claim 1 does not recite significantly more than the abstract concept as the system does not go beyond collecting data and performing analysis using abstract ideas on a processor. (Final Act. 2, 6–7; Ans. 4–5).

We concur with the Examiner, and we do not find that the claim recites significantly more than the abstract concept. Appellants’ arguments do not direct us to any element or combination of elements in the claim sufficient to transform the nature of the claim into a patent eligible application, that is, to ensure that the claim amounts to significantly more than the judicial exception. Instead, Appellants argue the claimed invention represents an improvement in the field of seismic imaging and identifying stratigraphic features, providing improved recognition and interpretation of depositional features. However, a patent-ineligible abstract idea is not transformed into a patent-eligible invention by “limit[ing] the use of [an abstract idea] ‘to a particular technological environment.’” *Alice*, 134 S. Ct.

at 2358, quoting *Bilski v. Kappos*, 561 U.S. 593, 610–11 (2010). As discussed above, this is just a method of gathering and manipulating data. Appellants do not identify nor adequately explain what additional features amount to significantly more than a patent upon the ineligible concept itself.

While Appellants argue that the claim does not preempt subject matter by attempting to patent any specific mathematical relationships or formulas, nor does it attempt to patent any general ones (App. Br. 20–21), the Examiner determined the claims are primarily directed to abstract ideas, with the remaining additional elements directed to a conventional data collection activity and usage of a generic processor. (Ans. 5). Appellants acknowledge that the claimed invention is directed to a method of performing a structural interpretation of a three-dimensional seismic volume, manipulating, transforming, and interpreting the structural interpretation. (App. Br. 20). However, Appellants do not adequately explain why the claimed invention does not preempt any specific mathematical relationships or formulas, or any general ones.

For the reasons stated above, and the reasons presented by the Examiner, we do not consider the independent claims to recite significantly more to transform the abstract idea to patent-eligible subject matter and we sustain the rejections of claims 1, 157–175 under 35 U.S.C. § 101.

*Rejections II*⁴

We have reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner's reasoned

⁴ Appellants present arguments for independent claims 1. (App. Br. 21–29). Appellants do not present separate substantive arguments that sufficiently

analysis and application of the prior art, as well as the Examiner's cogent and thorough disposition of the arguments raised by Appellants.

Accordingly, we will adopt the Examiner's reasoning as our own in sustaining the rejections of record, and we add the following for emphasis only.

Appellants argue Crawford does not disclose or teach any type of domain transformation that creates a stratal-slice volume as recited in the claimed invention. (App. Br. 25). Appellants argue Crawford also fails to provide any teaching or disclosure regarding these steps performed in the stratal-slice volume. (App. Br. 23).

We agree with the Examiner that Crawford discloses the domain transformation of enhanced 3D seismic volume into individual lateral slices (i.e. stratal slices). (*See* abstract). Further, Appellants are not claiming a domain transformation that creates a stratal slice but a transformation of a 3D image of the seismic volume into a stratal slice volume (*see* second limitation in claim 1). Appellants have not disputed the Examiner's determination that Crawford discloses a system that calculates a line enhanced value pixel of interest which is analogous to a stratigraphic attribute volume in the stratal-slice volume. (Ans. 5; Crawford col. 9 ll. 7–48).

Appellants argue the Examiner's determination that Crawford's lateral slices are the same as the stratal-slice volume of the claimed invention

address independent claim 166 or dependent claims 157–165 and 167–175. (*See generally* App. Br.). Our analysis applies to all the independent claims and we limit our discussion to independent claim 1 which we select as representative of the rejected claims.

(resulting from domain transformation applied to seismic data) is inaccurate. The Examiner determined that Crawford describes stratigraphic data is the spatial domain because the spatial domain is a normal image space in which a change in position in the image directly projects to a change in position in a scene. (Ans. 7; Crawford col. 7 ll. 25–32). Appellants have not disputed the Examiner’s determination.

Rejection III

Appellants repeat the arguments that Crawford fails to disclose or teach many of the elements of the claimed invention and therefore the Examiner has misapplied Crawford to the claimed invention. (App. Br. 27–28). Appellants argue Zeng does not disclose or teach stratigraphic interpretation that includes calculating at least one stratigraphic attribute volume in the stratal-slice volume, imaging a three-dimensional element of a depositional system using the at least one stratigraphic attribute volume and imaging a connected, closed bounding surface that entirely surrounds the three-dimensional element of the depositional system. (App. Br. 27–28).

We have reviewed each of Appellants’ arguments for patentability. However, we are in complete agreement with the Examiner’s reasoned analysis and application of the prior art.

The Examiner determined Crawford fails to disclose the transforming of both, at least one stratigraphic attribute volume and the bounding surfaces into the spatial domain is an inverse transformation. The Examiner cited Zeng for describing the transforming at least one stratigraphic attribute volume and a bounding surfaces into the spatial domain is an inverse transformation (see fig. 3 and page 518). The Examiner determined it

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would have been obvious to modify Crawford's invention to have the transformation to be an inverse transformation. Appellants have not disputed the Examiner's determination regarding Zeng.

ORDER

The rejection of claims 1 and 157–175 under 35 U.S.C. § 101 is affirmed.

The prior art rejections of claims 1 and 157–166 and claims 161 and 171 under 35 U.S.C. § 102 and 103(a) are affirmed.

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

AFFIRMED