UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ARTHUR E. BARNES

Appeal 2007-4114
Application 11/017,450
Technology Center 3600

Decided: January 22, 2009


SILVERBERG, Administrative Patent Judge.

DECISION ON APPEAL

STATEMENT OF THE CASE

SUMMARY OF DECISION

We REVERSE and ENTER A NEW GROUND OF REJECTION
PURSUANT TO OUR AUTHORITY UNDER 37 C.F.R. § 41.50(b).

THE INVENTION

The Appellant’s claimed invention is directed to a method for identifying faults in a seismic data volume (Spec.5;para. [0009]). Claims 1 and 30, reproduced below, are representative of the subject matter on appeal.

1. A fault identification method that comprises: obtaining seismic data; and for each of multiple positions of an analysis window in the seismic data, determining a planarity value for discontinuities in the analysis window.

30. A fault identification method that comprises: determining discontinuity values from seismic data; and applying principal component analysis to the discontinuity values to identify faults.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:


The following rejections are before us for review:

1. Claims 1, 13-18 and 30-34 are rejected under 35 U.S.C. § 102(b) (2002) as being as being anticipated by Gersztenkorn.

2. Claims 1, 13, 30 and 34 are rejected under 35 U.S.C. § 102(a) (2002) as being anticipated by Tingdahl.


**ISSUE**

The issue before us is whether the Appellant has shown that the Examiner erred in rejecting claims 1-5, 13-18 and 30-34 over Gersztenkorn; claims 1, 13, 30 and 34 over Tingdahl; and claims 6-12 over Gersztenkorn in view of Marfurt. The issue turns on whether Gersztenkorn, Tingdahl and Marfurt (“the cited art”) fail to teach or suggest every claim limitation.

**FINDINGS OF FACT**

We find that the following enumerated findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

1. The Appellant’s Specification discloses systems and methods for filtering seismic discontinuity data to enhance those features in the discontinuity data that have the geometrical characteristics of a fault (Spec.7:para. [0012]).
2. The Appellant’s Specification further discloses a fault identification method that comprises obtaining seismic data; for each of multiple positions of an analysis window in the seismic data, determining a planarity value for discontinuities in the analysis window; said determining a planarity value comprises determining a covariance matrix for discontinuity data in the analysis window, finding eigenvalues for the covariance matrix, and calculating a ratio between a smallest of the eigenvalues and an eigenvalue average; for each of multiple positions of an analysis window in the seismic data, determining a planarity filter value from the planarity value using a planarity function that ranges from zero to one; and for each of multiple positions of the analysis window in the seismic data, determining a centrality value for discontinuity data in the analysis window.

3. The Appellant’s Specification still further discloses a fault identification method that comprises determining discontinuity values from seismic data; applying principal component analysis to the discontinuity values to identify faults, and displaying identified faults in a time-slice view or a horizontal slice view.

4. Gersztenkorn discloses a fault identification method (Abstract, p. 1469, col. 1, ll. 1-16); wherein the method includes obtaining seismic data (Abstract, pp. 1469-1470), and using coherence to
determine faults (p. 1469, col. 1; p. 1470, cols. 1 and 2; and p. 1476, col. 1).

5. Gersztenkorn further discloses displaying identified faults in a time-slice view (fig. 1).

6. Tingdahl discloses a fault identification method (p. 1); wherein the method includes obtaining seismic data, and using coherence to determine faults (p. 1, col. 1).

7. Tingdahl further discloses that the fault identification method includes applying principal component analysis to identify faults (pp. 1-3).

8. Marfurt discloses that using a covariance matrix and eigenvalues in an analysis window can give information about the dip (verticality) or discontinuity (pp. 105-107 and 110).

9. The ordinary meaning of the word “planarity” is defined as “of, relating to, or lying in a plane.” Merriam-Webster’s Collegiate Dictionary (10th ed. 1996).

10. The ordinary meaning of the word “centrality” is defined as “the quality of the state of being central, central situation, and tendency to remain in or at the center.” Merriam-Webster’s Collegiate Dictionary (10th ed. 1996).

11. The ordinary meaning of the word “eigenvalue” is defined as “a scalar associated with a given linear transformation of a vector space and having the property that there is some nonzero vector which when multiplied by the scalar is equal to the vector obtained by letting the transformation operate on the vector; especially: a
root of the characteristic equation of a matrix.” Merriam-

PRINCIPLES OF LAW

Anticipation is established only when a single prior art reference
discloses, expressly or under the principles of inherency, each and every
element of a claimed invention. RCA Corp. v. Applied Digital Data Sys.,
Inc., 730 F.2d 1440, 1444 (Fed. Cir. 1984). In other words, there must be no
difference between the claimed invention and the reference disclosure, as
viewed by a person of ordinary skill in the field of the invention. Scripps
Clinic & Research Found. v. Genentech Inc., 927 F.2d 1565, 1576 (Fed. Cir.
1991). It is not necessary that the reference teach what the subject
application teaches, but only that the claim read on something disclosed in
the reference, i.e., that all of the limitations in the claim be found in or fully
met by the reference. Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 772

“Section 103 forbids issuance of a patent when ‘the differences
between the subject matter sought to be patented and the prior art are such
that the subject matter as a whole would have been obvious at the time the
invention was made to a person having ordinary skill in the art to which said
subject matter pertains.” KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 127 S.
Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis
of underlying factual determinations including (1) the scope and content of
the prior art, (2) any differences between the claimed subject matter and the
prior art, (3) the level of skill in the art, and (4) where in evidence, so-called
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(1966). See also KSR, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”)

In KSR, the Supreme Court stated that “[f]ollowing these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement.” Id. at 1740. The Court explained:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

Id. at 1740-41. The Court noted that “[t]o facilitate review, this analysis should be made explicit.” Id. (citing In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). However, “the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” Id.

When construing claim terminology in the United States Patent and Trademark Office, claims are to be given their broadest reasonable interpretation consistent with the Specification, reading claim language in
light of the Specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

Whether a claim is drawn to patent-eligible subject matter under §101 is a threshold inquiry, and any claim of an application failing the requirements of §101 must be rejected even if it meets all of the other legal requirements of patentability. *In re Bilski*, 88 USPQ2d 1385, 1388 (Fed. Cir. 2008).

The Federal Circuit stated that if the effect of allowing of a claim would be to allow the patentee to pre-empt substantially all uses of a fundamental principle, the claim is not drawn to patent eligible subject matter. *Id.* at 1390.

The Federal Circuit concluded that “… [W]e … reaffirm that the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under §101.” *Id.* at 1392.

The Federal Circuit stated that “insignificant postsolution activity” will not transform an unpatentable principle in a patentable process. *Id.* at 1393.

The Federal Circuit further stated that the machine-or-transformation test is as follows: “The machine-or-transformation test is a two-branched inquiry; an applicant may show that a process claim satisfies §101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article.” *Id.* at 1396.

The Federal Circuit further stated that “adding a data-gathering step to an algorithm is insufficient to convert that algorithm into a patent-eligible process.” *Id.* at 1397.
ANALYSIS

Rejection of claims 1, 13-18 and 30-34 under 35 U.S.C. 102(b) as being
as being anticipated by Gersztenkorn, claims 2-5 under 35 U.S.C. § 103(a)
as being unpatentable over Gersztenkorn, and claims 6-12 under 35 U.S.C.
§ 103(a) as being unpatentable over Gersztenkorn in view of Marfurt.

Appellant provides a definition of planarity and contends that
Gersztenkorn does not disclose determining a planarity value for
discontinuities in the analysis window as called for in claim 1 (Br. 12).

Upon review of the Specification, we find that the Specification does not
include the argued definition of the term planarity. Further, we find that the
Specification does not include any definition of the term planarity. As such,
we cannot look to the Specification for support for the definition of the term
planarity. Therefore, we give the term planarity its broadest reasonable
interpretation. See Am. Acad. of Sci. Tech. Ctr. at 1359. In giving the term
planarity its broadest reasonable interpretation we will use its ordinary and
customary meaning. The ordinary meaning of the word “planarity” is
defined as “of, relating to, or lying in a plane.” Merriam-Webster’s

Collegiate Dictionary (10th ed. 1996) (Fact 9). We find that claim 1 calls
for determining a planarity value for discontinuities in the analysis window.
However, Gersztenkorn neither mentions the term planar nor discloses any
determining of planarity values. We do not agree with the Examiner’s
analysis (Ans. 11) that since Gersztenkorn is determining values that are
associated with planar events in some way, these values may be broadly
interpreted as planarity values. Therefore, we conclude that Gersztenkorn
does not disclose determining a planarity value for discontinuities in the
analysis window as called for in claim 1 and claims 2-18 depending from
claim 1. Nor does the Examiner provide any reason with rational
underpinning to explain why it would have been obvious to provide this
feature in Gersztenkorn or rely on any teaching in Marfurt that would
remedy this deficiency in Gersztenkorn so as to support a conclusion of
obviousness of the subject matter of claims 2-12.

Appellant contends that Gersztenkorn does not disclose determining
discontinuity values from seismic data and applying principal component
analysis to the discontinuity values to identify faults as called for in claim 30
(Br. 13-14). We do not agree with the Examiner’s analysis (Ans. 12-13) that
since in Gersztenkorn certain aspects of the seismic data contain
discontinuity data, discontinuity values are considered as being represented
by the data; and since principal component analysis is applied to the seismic
data, it is applied to the discontinuity values that the seismic data represent.
We conclude that Gersztenkorn does not disclose determining discontinuity
values from seismic data and applying principal component analysis to the
discontinuity values to identify faults as called for in claim 30 and claims
31-34 depending from claim 30.

Rejection of claims 1, 13, 30, and 34 under 35 U.S.C. 102(a) as being as
being anticipated by Tingdahl.

Appellant again argues a specific definition of planarity that we have
found not to be included in the specification and contends that Tingdahl does
not disclose determining a planarity value for discontinuities in the analysis
window as called for in claim 1 (Br. 14). For the reasons previously set
forth, we give the term planarity its broadest reasonable interpretation. See
Am. Acad. of Sci. Tech. Ctr. at 1359. In giving the term planarity its
broadest reasonable interpretation we will again use its ordinary and customary meaning. The ordinary meaning of the word “planarity” is defined as “of, relating to, or lying in a plane.” *Merriam-Webster’s Collegiate Dictionary* (10th ed. 1996) (Fact 9). We do not agree with the Examiner’s analysis (Ans. 13-15) that since the claim limitations allow for a broad interpretation, Tingdahl meets the limitations. We find that claim 1 calls for determining a planarity value for discontinuities in the analysis window. However, Tingdahl neither mentions the term planar nor discloses any determining of planarity values. Therefore, we conclude that Tingdahl does not disclose determining a planarity value for discontinuities in the analysis window as called for in claim 1 and claim 13 depending from claim 1.

Regarding claim 30, Appellant argues that Tingdahl does not disclose applying principal component analysis to the results (Br. 15). We do not agree with the Examiner’s analysis (Ans. 14-15) and conclude that Tingdahl does not disclose the limitations as called for in claim 30 and claim 34 depending from claim 30.

NEW GROUND

We enter a new ground of rejection of claims 1-18 and 30-34 pursuant to 37 C.F.R. § 41.50(b).

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
Claims 1-18 and 30-34 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, because it is not tied to a particular machine, or does not transform an article. That is, the method as claimed does not transform any article to a different state or thing. The Federal Circuit stated that the machine-or-transformation test is as follows: “The machine-or-transformation test is a two-branched inquiry; an applicant may show that a process claim satisfies §101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article.” See In re Bilski at 1396. Claims 1 and 30 are reproduced in the Invention section (p. 2) of this Decision on Appeal. A review of the claims reveals that they call for the gathering, analyzing and displaying of data without any details as to how the data is gathered, analyzed or displayed. In particular, claim 1 calls for the gathering and analyzing of data. Claims 2-18, which depend from claim 1, additionally call for the analyzing of data. Claim 30 calls for the analyzing of data. Claims 31-34, which depend from claim 30, additionally call for the displaying of data. As such, the claims neither specifically call for a machine nor reference a machine. The adding of a data-gathering step to a process claim (claims 1-18) is insufficient to convert a process into a patent-eligible process. See id. at 1397. A claim that is drawn only to the analyzing of data (dependent claims 2-18 and independent claim 30) is a claim that seeks to pre-empt the use of a fundamental principle. See id. at 1390. The displaying of the data (claims 31-34) without more (e.g., a reference as to how and why it is displayed) is determined to be “insignificant postsolution activity” and as such will not transform the claimed method into a patentable method. See id. at 1393. Therefore, we
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1 find that the method as called for in claims 1-18 and 30-34 is not tied to a
2 machine. Further, as the claimed method contains physical steps (gathering,
3 analyzing and displaying) it does not involve transforming an article into a
4 different state or thing. Accordingly, the method as called for in claims 1-18
5 and 30-34 fails “the machine-or-transformation test.”

6
7 CONCLUSION OF LAW
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9 We conclude that the Appellant has shown that the Examiner erred in
10 rejecting claims 1, 13-18 and 30-34 under 35 U.S.C. § 102(b) as anticipated
11 by Gersztenkorn; claims 1, 13, 30 and 34 under 35 U.S.C. § 102(a) as being
12 anticipated by Tingdahl; claims 2-5 under 35 U.S.C. § 103(a) as being
13 unpatentable over Gersztenkorn; and claims 6-12 under 35 U.S.C. § 103(a)
14 as being unpatentable over Gersztenkorn in view of Marfurt; as “the cited
15 art” does not teach or suggest every claim limitation.

16 Pursuant to 37 C.F.R. 41.50(b), we enter a new ground of rejection of
17 claims 1-18 and 30-34 under 35 U.S.C. § 101 as being non-statutory subject
18 matter, as set forth above.

19
20 DECISION
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22 The decision of the Examiner to reject claims 1, 13-18 and 30-34
23 under 35 U.S.C. § 102(b) over Gersztenkorn; claims 1, 13, 30 and 34 under
24 35 U.S.C. § 102(b) over Tingdahl; claims 2-5 under 35 U.S.C. § 103(a)
25 (2004) over Gersztenkorn; and claims 6-12 under 35 U.S.C. § 103(a) over
26 Gersztenkorn in view of Marfurt is reversed. We enter a new ground of
FINALITY OF DECISION

In addition to reversing the Examiner's rejection(s) of one or more claims, this decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) (2007). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new grounds of rejection to avoid termination of the appeal as to the rejected claims:

(1) Reopen prosecution. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .

(2) Request rehearing. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .


REVERSED; 37 C.F.R. § 41.50(b)
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