UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW J. FITT

Appeal 2012-010250
Application 12/201,802
Technology Center 2100

Before MAHSHID D. SAADAT, JOHN A. EVANS, and
JOHN F. HORVATH, *Administrative Patent Judges*.

HORVATH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks review of the Examiner's rejection of claims 1–17 under 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE, and enter NEW GROUNDS OF REJECTION pursuant to our authority under 37 C.F.R § 41.50(b).

SUMMARY OF THE INVENTION

The invention is directed to a system and method for creating an index structure for spatial data. Abstract.

Claims 1, 7, and 14, reproduced below, are illustrative of the claimed subject matter:

> 1. A method for creating an index structure for spatial data, comprising:
>
> representing a product structure by a network of nodes and edges;
>
> setting a local geometric bound for each of said network nodes;
>
> propagating a cumulative geometric bound of said local geometric bounds along each of said network edges; and
>
> simplifying said cumulative geometric bound at each of said network nodes during said propagation;
>
> whereby a geometric bound of each network node forms a spatial index geometric bound for a matching data model object.
>
> 7. A spatial index, comprising:
>
> a product structure represented by a network of nodes and edges;
>
> a local geometric bound set for each of said network nodes;
>
> a cumulative geometric bound of said local geometric bound set propagated along each of said network edges; and
>
> a match formed between a data model object and said cumulative geometric bound of each of said network nodes.
>
> 14. A system for data management, comprising:
>
> a geometric model having a plurality of geometric model objects;
>
> a list of data model objects corresponding to said geometric model to define a product structure; and
>
> a geometric spatial index that supports geometric queries on said list of data model parts in a time-efficient manner.

REFERENCES

Pabon	US 5,251,290	Oct. 5, 1993
Bae	US 2007/0016600 A1	Jan. 18, 2007

REJECTIONS

Claims 1–17 stand rejected under 35 U.S.C §103(a) as unpatentable over Pabon and Bae. Ans. 4.

ISSUES AND ANALYSIS

I. *Whether the Examiner erred in finding Pabon teaches or suggests setting a local geometric bound for each node in a graph, and propagating a cumulative geometric bound along the edges of the graph*.

Claims 1–13 and 17 recite setting a geometric bound for each node in a graph representing a product structure, and propagating a cumulative geometric bound along the edges of the graph. Claims App'x. The Examiner finds Pabon's disclosure of a bipartite graph containing two sets of nodes *u* and *v* and a set of links *l* between the nodes teaches or suggests setting a local geometric bound for each node in a graph. Ans. 4 (citing Pabon 6:16–18, Fig. 17). The Examiner finds Pabon's disclosure of calculating a constrained path through the nodes of a graph by calculating the maximum flow reversal through the edges connecting the nodes teaches or suggests propagating a cumulative geometric bound along the edges of the graph. Ans. 5 (citing Pabon 5:1–2, Fig. 24). Appellant contends these disclosures have "nothing to do with any local geometric bound," and fail to teach or suggest "anything related to propagating a cumulative geometric

bound of the local geometric bounds along each of the network edges, as claimed." App. Br. 23–24.

We agree with Appellant. The portions of Pabon cited by the Examiner do not teach or suggest setting a geometric bound for each node in a graph or propagating a cumulative geometric bound along the edges of the graph as recited in claims 1–13 and 17. We, therefore, do not sustain the Examiner's rejection of claims 1–13 and 17 under 35 U.S.C. § 103(a) as unpatentable over Pabon and Bae.

II. *Whether the Examiner erred in finding Pabon teaches or suggests a system having a list of data model objects corresponding to a geometric model that define a product structure.*

Claim 14 recites a data management system that includes a list of data model objects that correspond to a geometric model and define a product structure. Claims App'x. Claims 15 and 16 depend from claim 14, and include the same limitation. *Id*. The Examiner finds Pabon's disclosure of a listing of geometric elements teaches or suggests a list of data model objects corresponding to a geometric model that define a product structure. Ans. 10 (citing Pabon 4:34–35; Fig. 9). Appellant contends "Pabon does not teach or suggest a product structure at all, much less one that is defined by a list of data model objects, as claimed, and certainly does not do so in the col. 4 passage cited in the Office Action." App. Br. 49.

We agree with Appellant. Pabon describes figure 9 as "a listing of examples of geometric elements and their corresponding degrees of freedom." Pabon 4:34–35. Although Pabon's listing of geometric elements

might be considered a geometric model, Pabon does not disclose they correspond to data model objects that define a product structure. We, therefore, do not sustain the Examiner's rejection of claims 14–16 under 35 U.S.C. § 103(a) as unpatentable over Pabon and Bae.

III. *Other Arguments.*

Appellant raises additional arguments for the patentability of claims 1–17. App. Br. 19–56. Because we do not sustain the Examiner's rejection of claims 1–17 for the reasons discussed *supra*, we need not address these additional arguments. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on "a single dispositive issue").

IV. *New Grounds of Rejection*.

Pursuant to our authority under 37 C.F.R. § 41.50(b), we reject claims 1–17 under 35 U.S.C. § 101 as directed to non-patentable subject matter.

Section 101 of the Patent Act permits the patenting of "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Despite its broad language, the Supreme Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l,* 134 S.Ct. 2347, 2354 (2014)(internal citations omitted). The Supreme Court has set forth a two-part test to determine whether a claim is directed to a

patent-ineligible abstract idea. First, one determines whether the claim is directed to an abstract idea. *Alice,* 134 S.Ct. at 2355. Abstract ideas include, but are not limited to, fundamental economic practices, methods of organizing human activities, an idea of itself, and, mathematical formulas or relationships. *Id.* at 2355–2357. Next, if the claim is directed to an abstract idea, one determines whether the claim as a whole—including all elements or combination of elements— is directed to *significantly more* than the abstract idea itself, i.e., to a patent-eligible application of the abstract idea. *Id.* at 2355. To be directed to *significantly more* than the abstract idea itself, the claim must recite more than generic, conventional, routine functions or components needed to implement or instantiate the abstract idea on a computer or system. *Id*. at 2357–2360.

When we consider the patentability of claims 1–17 under 35 U.S.C. § 101, we find claims 1–6 and 12–17 to be directed to a patent ineligible abstract idea, and claims 7–11 to be directed to a patent-ineligible mathematical object that is not a process, machine, manufacture, or composition of matter as required by the Patent Act. *See*, 35 U.S.C. § 101.

Claims 1–6

Claims 1 and 5 are directed to a method of creating a mathematical graph (i.e., a network of nodes and edges) that represents a product structure (claim 1) or an unconfigured structure (claim 5). Claims App'x 1–2. The nodes of the graph represent the components of the structure and their geometric bounds, while the edges of the graph represent connections between components and how the geometric bounds are propagated from

one component to another. Claims App'x 1–2, Spec. ¶¶ 21–22, Table 1. Dependent claims 2–4 and 6 limit the mathematical graphs to graphs representing the geometric dependencies of the structures, which describe either their geometries or geometric containments. Claims App'x 1–2.

We find claims directed to a method of creating a mathematical graph to represent a structure—whether a product structure or unconfigured structure—to be directed to an abstract idea. *See Alice Corp. Pty. Ltd.*, 134 S.Ct. at 2355–2357 (finding claims directed to mathematical algorithms, formulas or relationships to be directed to abstract ideas). We next consider whether the claims as a whole add *significantly more* to this abstract idea. We find they do not.

Claims 1–6 do not recite any limitations that go beyond those required to implement the abstract idea of creating a mathematical graph to represent a structure as a geometric dependency network. The recited limitations, including setting geometric bounds for the nodes of the graph, propagating the geometric bounds along the edges of the graph, and simplifying the accumulated geometric bounds propagated to the nodes of the graph are simply those limitations or steps required to create a mathematical graph representing a structure as a geometric dependency network. Claims App'x 1–2. Such limitations do not limit the claims to a *particular application* of this abstract idea. We, therefore, reject claims 1–6 under 35 U.S.C. § 101 as directed to a patent-ineligible abstract idea.

Claims 12, 13, and 17

Claims 12, 13, and 17 are directed to computer and data processing systems for creating a mathematical graph to represent an unconfigured structure as a geometric dependency network. Claims App'x 4–6. They thus limit the abstract idea recited in claims 1–6 to a method performed on a computer system that includes a memory, processor, input device and display (claims 12 and 13) or a data processing system that includes a memory and processor (claim 17). *Id.* But like the system claims in *Alice*, claims 12, 13, and 17 are "no different from the method claims in substance. The method claims recite the abstract idea . . .; the system claims recite a handful of generic computer components configured to implement the same idea." *Alice Corp. Pty. Ltd.*, 134 S.Ct. at 2360. And the "mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention." *Id.* at 2358. We, therefore, reject claims 12, 13, and 17 under 35 U.S.C. § 101 as directed to a patent-ineligible abstract idea.

Claims 14–16

Claims 14–16 are directed to a data management system that includes a geometric model having a plurality of geometric model objects, a list of corresponding data model objects that define a product structure, and a spatial index that supports queries on the list of data model objects. Claims App'x 5. The geometric model can be a mathematical graph (network of nodes and edges) in the form of a geometric dependency network that describes the geometric use or containment of the geometric model. *Id.*

We find claims directed to a system consisting of a geometric model, a corresponding or allied data object model, and an index describing the relationship or correspondence between objects in the geometric and data models to be directed to an abstract idea. *See Alice Corp. Pty. Ltd.*, 134 S.Ct. at 2355–2357 (finding claims directed to mathematical algorithms, formulas or relationships to be directed to abstract ideas). We, therefore, consider whether the claims as a whole add *significantly more* to this abstract idea. We find they do not.

Claims 14–16 do not recite any limitations that go beyond the abstract idea of a system that links objects in a geometric model with objects in a data model. Claims App'x 5. In fact, the claims do not even limit the recited geometric or data model objects or the spatial index correlating the geometric and data model objects to particular physical or tangible things, such as instantiations in a computer or computer readable memory. Thus, the claim is broad enough to read on a person's thoughts as the person ponders relationships (i.e., a spatial index) correlating objects in a mentally constructed geometric model with objects in a mentally constructed data model defining a product. Because the limitations recited in claims 14–16 do not limit the claims to a *particular application* of the abstract idea of a system that links objects in a geometric model with objects in a data model, we reject claims 14–16 under 35 U.S.C. § 101 as directed to a patent-ineligible abstract idea.

Claims 7–11

As noted *supra*, Section 101 of the Patent Act permits the patenting of "any new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. Our reviewing Court has found:

> For all categories except process claims, the eligible subject matter must exist in some physical or tangible form. To qualify as a machine under section 101, the claimed invention must be a "concrete thing, consisting of parts, or of certain devices and combination of devices." *Burr v. Duryee*, 68 U.S. 531, 570 . . . (1863). To qualify as a manufacture, the invention must be a tangible article that is given a new form, quality, property, or combination through man-made or artificial means. *Diamond v. Chakrabarty*, 447 U.S. 303, 308 . . . (1980). Likewise, a composition of matter requires the combination of two or more substances and includes all composite articles. *Id.*

Digitech Image Tech., LLC v. Electronics for Imaging, Inc., 758 F.3d 1344, 1348–49 (Fed. Cir. 2014).

We find claims 7–11 to be patent-ineligible because they are not directed to anything that exists in a physical or tangible form. Rather, claims 7–11 are directed to a spatial index—i.e., to a collection of information about a product structure that is represented in a mathematical graph having nodes and edges. Claims App'x 2–3. Each node of the graph is provided with a geometric bound. *Id*. at 3. The geometric bounds are accumulated by propagation from node to node along the edges of the graph, and can be simplified at each node. *Id.* A data model, corresponding to the product structure, is matched to or allied with the nodes of the graph. *Id.* The product structure can be unconfigured—i.e., not completely specified. *Id.* The mathematical graph (referred to as a network of nodes and edges) can

represent the geometric dependency of the product structure—i.e., it can describe the geometry or geometric containment of the product structure. *Id.*

We find no limitation recited in claims 7–11 that limits the spatial index to a physical or tangible thing. *See*, Claims App'x 2–3. The spatial index can simply be an idea formulated in someone's mind—i.e., an entirely mental construct. Consequently, we reject claims 7–11 under 35 U.S.C. § 101 for failing to recite a statutory category of patent-eligible subject matter. *See*, *Digitech Image Tech.* 758 F.3d at 1349–1350 (finding claims directed to a device profile consisting of a collection of information invalid under 35 U.S.C. § 101 for falling outside of any statutory category of patent-eligible subject matter).

DECISION

For the reasons indicated *supra*, the Examiner's rejection of claims 1–17 is reversed.

Pursuant to our authority under 37 C.F.R. § 41.50(b), we reject claims 1–17 under 35 U.S.C. § 101 as directed to unpatentable subject matter, and designate the rejection a new grounds of rejection.

Section 41.50(b) provides that "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." Rather, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, Appellant must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the newly 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 . . . .

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)(iv) (2009).

REVERSED
37 C.F.R. § 41.50(b)

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