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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte EARL NORDSTRAND

Appeal 2017-009614
Application 13/947,988
Technology Center 3600

Before CARLA M. KRIVAK, CARL W. WHITEHEAD JR., and JOHN R. KENNY, *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from a non-final rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Appellant's invention is directed to "a computer-implemented method comprising a process of receiving geographic data corresponding to a geographic area, receiving population data corresponding to a population of the geographic area, and generating a distribution of the population over the geographic area based on characteristics of geographic features of the geographic area." Abstract.

Independent claim 1, reproduced below, is exemplary of the subject matter on appeal.

> 1. A computer-implemented method comprising:
>
> receiving electronic geographic image data corresponding to a geographic area, wherein the geographic area includes geographic features;
>
> receiving electronic road-based data including a location of a plurality of roads within the geographic area;
>
> calculating, by the processor, a road density for each location of the plurality of roads;
>
> calculating, by the processor, a weighted coefficient for the geographic image data based on the geographic features;
>
> calculating, by the processor, a weighted coefficient for the road-based data based on the location and density of the plurality of roads;
>
> generating, by the processor, a dasymetric surface map based on the combined weighted geographic image data and the weighted road-based data;
>
> receiving population data corresponding to a population of the geographic area; and
>
> generating, by the processor, a distribution of the population over the geographic area based on the combination of the population data and dasymetric surface map.

REJECTIONS and REFERENCES

The Examiner rejected claims 1–20 under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.

The Examiner rejected claims 1–20 under 35 U.S.C. § 101 as directed to an abstract idea.

The Examiner rejected claims 1–3, 5, 6, 11–13, and 15–20 under 35 U.S.C. § 103(a) based upon the teachings of Maantay (Juliana Astrud Maantay et al., *Mapping Population Distribution in the Urban Environment: The Cadastral-based Expert Dasymetric System (CEDS)*, 34:2 CARTOGRAPHY & GEOGRAPHIC INFO. SCI. 77–102 (2007)) and Xie (Yichun Xie, *The Overlaid Network Algorithms for Areal Interpolation Problem*, 19:4 COMPUT. ENVIRON. & URBAN SYS. 287–306 (1995)).

The Examiner rejected claims 4 and 14 under 35 U.S.C. § 103(a) based upon the teachings of Maantay, Xie, and Deardorff (US 2009/0003657 A1; Jan. 1, 2009).

The Examiner rejected claims 7–10 under 35 U.S.C. § 103(a) based upon the teachings of Maantay, Xie, and Dumas (US 2005/0222829 A1; Oct. 6, 2005).

ANALYSIS

Rejection under 35 U.S.C. § 112

The Examiner finds claims 1–20 fail to satisfy the § 112 (a) written description requirement. Non-Final Act. 16–27. The Examiner finds the claims are broad and the Specification fails to "adequately describe the structure and functionality described" and to clearly convey what the Appellant has invented. *Id.* at 27. Specifically, the Examiner states "[h]ow

the various features are weighted is not described" in Appellant's Specification. *Id.* at 17.

Appellant contends:

> One of ordinary skill in the art would appreciate and easily discern the appropriate values to assign specific features and multipliers, which could be different for different applications, based on the characteristics of their particular application. That is, one of ordinary skill in the art would easily interpolate appropriate values for the various weightings.

App. Br. 11. Appellant also asserts paragraph 46 of the Specification recites examples of specific ranges of weights. *Id.* Thus, "one of ordinary skill in the art would easily interpolate appropriate values for the various weightings." *Id.*

Specifically, Appellant contends the claim recites calculating "a weighted coefficient for the road-based data based on the location and density of the plurality of roads." Appellant states, generally, paragraphs 33–46, and Figures 4 and 5, support the limitations recited in the claims. App. Br. 4–5.

There is, however, no written description in paragraphs 33–46, nor anywhere in Appellant's Specification, for a "weighted coefficient" let alone a "weighted *coefficient* for the road-based data based on *the location* and density of the plurality of roads" (emphasis added). Because there is no written support for weighted coefficient based on the location of the plurality of roads, we sustain the Examiner's rejection under 35 U.S.C. § 112(a).

Rejection under 35 U.S.C. § 101

Patent eligibility is a question of law that is reviewable *de novo*. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012). Patentable subject matter is defined by 35 U.S.C. § 101 as follows:

> [w]hoever 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.

In interpreting this statute, the Supreme Court emphasizes that patent protection should not preempt "the basic tools of scientific and technological work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012); *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014). The rationale is that patents directed to basic building blocks of technology would not "promote the progress of science" under the U.S. Constitution, Article I, Section 8, Clause 8, but rather, would impede it. Accordingly, laws of nature, natural phenomena, and abstract ideas are not patent-eligible subject matter. *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343, 1346 (Fed. Cir. 2017) (citing *Alice*, 134 S. Ct. at 2354).

To determine whether subject matter is patentable under § 101, the Supreme Court has set forth a two part test "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355. The first step in the analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts," such as an abstract idea. *Id.* (citation omitted). For computer-related technologies, "the first step in the *Alice* inquiry . . . asks whether the focus of the claims is on

the *specific asserted improvement* in computer capabilities" (which would be eligible subject matter) or instead "on a process that qualifies as an 'abstract idea' for which *computers are invoked merely as a tool*" (which would be ineligible subject matter). *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36, 1338 (Fed. Cir. 2016) (emphasis added). "If the claims are not directed to an abstract idea [or other patent-ineligible concept], the inquiry ends. If the claims are 'directed to' an abstract idea, then the inquiry proceeds to the second step of the *Alice* framework." *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016).

The second step in the *Alice* framework is to consider the elements of the claims "individually and 'as an ordered combination'" to determine whether there are additional elements that "'transform the nature of the claim' into a patent-eligible application." *Alice*, 134 S. Ct. at 2355 (citing *Mayo*, 566 U.S. at 78). In other words, the second step is to "search for an 'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (citing *Mayo*, 566 U.S. at 72–73). The "inventive concept" must be significantly more than the abstract idea itself, and cannot be simply an instruction to implement or apply the abstract idea on a computer. *Alice*, 134 S. Ct. at 2358. "'[W]ell-understood, routine, [and] conventional activit[ies]' previously known to the industry" are insufficient to transform an abstract idea into patent-eligible subject matter. *Id.* at 2359 (citing *Mayo*, 566 U.S. at 73).

Alice/Mayo—Step 1 (Abstract Idea)

Turning to the first part of the *Alice/Mayo* analysis, the Examiner determines claims 1–20 are directed to a "series of steps instructing how to

map various factors of human population (e.g. demographic characteristics), which is a mathematical relationship/formulas and thus an abstract idea." Non-Final Act. 8.

Appellant contends the Examiner has over generalized the claims and "ignores the novel and complex processes (e.g., image science, mapping, manipulating electronic data, etc.)" involved in analyzing image data and generating a dasymetric surface map and a corresponding population distribution. App. Br. 7. Appellant asserts these steps cannot be performed by a human alone. *Id.* Appellant recites district court cases that do not bind us and states "it is unfathomable that the Examiner can view (i) using image processing techniques to discern geographic features in a pixelated image" and the calculating, generating, and determining steps are "computationally expensive." *Id.* at 7–8.

Initially, we note there is no recitation in the claims regarding discerning geographic features in a pixelated image. Also, we agree with the Examiner, Appellant's invention is directed to "generating a 'dasymetric surface map'" (emphasis omitted), which can be performed by a human. Ans. 6. The Examiner provides references from the 1800's supporting this determination. *Id.* at 7. We, therefore, agree Appellant's "invention is thus a modern embodiment of this approach, by using digital map layers in order to show geographic relationships within a map." *Id.* at 9 (citing *Versata Dev. Grp., Inc. v. SAP Am., Inc.*, 793 F.3d 1306 (Fed. Cir. 2015); *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1255 (Fed. Cir. 2014)).

Additionally, the Federal Circuit concluded "a process defined simply as using a computer to perform a series of mental steps that people, aware of each step, can and regularly do perform in their heads" is not patent eligible.

See SmartGene, Inc. v. Advanced Biological Labs., SA, 555 F. App'x 950, 954 (Fed. Cir. 2014) (unpublished) (citing *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) ("Such a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101.")). "[W]ith the exception of generic computer-implemented steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper." *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016); *see also FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1095 (Fed. Cir. 2016) ("While the claimed system and method certainly purport to accelerate the process of analyzing audit log data, the speed increase comes from the capabilities of a general-purpose computer, rather than the patented method itself.")

Thus, we agree under *Alice* step 1, Appellant's claims are directed to an abstract idea.

Alice/Mayo—Step 2 (Inventive Concept)

Appellant also alleges the claims include more than a generic computer, which would not be capable of performing the functionality recited in the claims. App. Br. 9. Appellant asserts only a special purpose/programmed computer is capable of performing the claim and the claims "contain unconventional steps that confine the claim to a particular useful application." *Id.* at 10. Appellant, however, does not specify what the special purpose computer is and what the purported unconventional steps are.

Appellant's Specification, paragraph 83, recites "[c]omputer system 800 can be implemented as any of various computing devices, including,

e.g., a desktop or laptop computer, tablet computer, smart phone, personal digital assistant (PDA), or any other type of computing device," which are all generic computing devices. *See also* Spec. ¶ 84 (which recites a generic processor).

Thus, the Examiner finds, and we agree, Appellant's claims do not include additional elements that amount to significantly more than the judicial exception. Appellant's claims are directed to an abstract idea including generic computer elements, adding no meaningful limitation to the abstract idea because they are routine.

We, therefore, sustain the Examiner's rejection of claims 1–20 as patent ineligible.

Rejection under 35 U.S.C. § 103

The Examiner finds Maantay discloses all the claim limitations except for calculating a weighted coefficient for the road based data, generating a dasymetric surface map based on the weighted geographic image data and weighted road-based data, receiving population data corresponding to a geographic area, and generating a distribution of the population over the geographic area based on the population data and dasymetric surface map. Non-Final Act. 30–34. The Examiner finds Xie discloses these limitations. *Id.* at 34–36 (citing Xie 299 ("Common sense suggests that residential densities or population concentrations differ along different categories of roads.")).

Appellant contends the Examiner erred in finding Maantay and Xie do not teach or suggest "calculating . . . a road density . . ." as claimed. App. Br. 11–12. That is, Appellant asserts "Maantay discusses deriving weights

for interpolating population based on the existence of streets, not on the density of the streets." *Id.* at 11. Xie discloses TIGER files (as does Maantay) which include classifications of various types of streets, but not the density of roads. *Id.* at 12. We do not agree.

Xie discloses:

> The TIGER/Line files contain all map features, including information on street segments which are particularly useful for areal population interpolation. People are sheltered by houses. *Houses are usually located along the sides of streets or along roads. As a result, the distribution of population in an areal unit is closely related to the street network.* This *suggests that the street network provides an important supplementary information about a population's distribution over an area.*

Xie 294 (emphasis added). Xie then states "[c]ommon sense suggests that residential *densities* or population concentrations differ along different categories of roads." *Id.* at 299. Maantay also discloses using TIGER files for interpolating population and states "[b]uilding on previous similar work by Ong and Houston (2003) and Xie (1996), they used *the street and road grid* as a proxy for approximate population and *housing unit density surfaces* for census tracts in the county." Maantay 84 (col. 1) (emphasis added). Maantay also discloses "the street-weighting method offers a 70 percent improvement over areal-weighting for the estimation of the housing unit count variable and a 20 percent improvement for the estimation of the total population count variable." *Id.* at 84 (col. 1–col. 2). Contrary to Appellant's assertion, the combination of Xie and Maantay at least suggest calculating a density for each location of a plurality of roads, using TIGER or other data, as claimed.

Thus, we sustain the Examiner's rejection of independent claims 1, 11, and 17, and dependent claims 2–10, 12–16, and 18–20, not separately argued.

DECISION

The Examiner's decision rejecting claims 1–20 under 35 U.S.C. § 112(a) is affirmed.

The Examiner's decision rejecting claims 1–20 under 35 U.S.C. § 101 is affirmed.

The Examiner's decision rejecting claims 1–20 under 35 U.S.C. § 103(a) 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)(iv).

AFFIRMED