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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte STUART THOMPSON
and ROBERT GARDNER

Appeal 2019–004687
Application 14/860,702
Technology Center 3600

Before STEFAN STAICOVICI, MICHAEL L. HOELTER, and LISA M. GUIJT, *Administrative Patent Judges*.

GUIJT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134(a) of the rejection of claims 1–18.[1] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies ARRIS ENTERPRISES, INC. as the real party in interest. Br. 3. Appellant's Appeal Brief omitted page numbers; we refer to pages 1 to 19, inclusive of the Claims Appendix.

THE INVENTION

Appellant's invention relates to "Systems and Methods for Street Level Routing" (SLR) (Spec., Title), for example, "[r]outes [may] be determined for [service representatives] such that all jobs are serviced with optimal routes being selected based upon a set of control parameters." (*id.* ¶ 30). Claims 1, 2, and 3 are the independent claims on appeal. Claim 1, reproduced below with paragraph numbers added for reference, is illustrative of the subject matter on appeal.

> 1. A system for street level routing comprising a computing device configured for:
>
> [(i)] dividing a mapping of a geospatial region into a plurality of sections, the geospatial region having a plurality of job locations, each job location associated with at least one job, wherein the dividing comprises dividing the mapping so that each section of the plurality of sections is balanced, as measured by one or more of a job count and a job weight, with the other sections of the plurality of sections;
>
> [(ii)] dividing the mapping into a plurality of cells, each cell having one or more pathways located within the cell;
>
> [(iii)] determining a traversability weighting for each of the cells, based at least on a traversability measure associated with the one or more pathways located within the respective cell, wherein each pathway has an individual measure of traversability;
>
> [(iv)] using one or more of the traversability weightings to further subdivide one or more of the plurality of sections;
>
> [[(v)] pre-calculating total weights associated with one or more routes for traversing every cell to every other cell, wherein each total weight is calculated based at least on the traversablity weightings of a start cell, an end cell, and any intermediate cells in a route between the start cell and the end cell;

> [(vi)] using one or more of the pre-calculated total weights to determine one or more routes between a first point and a second point in the geospatial region, the first point mapped in a first cell and the second point mapped in a second cell; and
>
> [(vii)] determining one or more preferred routes in accordance with a ranking of one or more routes between the first cell and the second cell, the ranking based on one or more efficiency criteria;
>
> [(viii)] a routing engine, using the one or more preferred routes to generate an initial assignment of a service representative to travel to a first job location associated with the first point, the service representative selected from a pool of service representatives, wherein the service representative is assignable to travel to a plurality of service job locations associated with the one or more preferred routes; and
>
> [(ix)] a dashboard comprising one or more controls for controlling the routing engine in assigning the service representative to travel to one or more of the plurality of service job locations associated with the one or more preferred routes.

THE REJECTION[2]

Claims 1–18 stand rejected under 35 U.S.C. § 101 as directed to ineligible subject matter.

OPINION

Appellant argues claims 1–18 as a group. Br. 5–11. We select claim 1 as representative, and claims 2–18 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

[2] The Examiner's rejection of claims 1 and 9–13 under 35 U.S.C. § 112, second paragraph, as indefinite, has been withdrawn. Ans. 3; *see also* Final Act. 6–7.

An invention is patent eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." *See* 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. Pty. Ltd. 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 Services 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, 191 (1981)); "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores" (*id.* at 182 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, 191 ("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." *Diehr*, 450 U.S. 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."), and 191 (citing *Benson* and *Flook*).

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 [requiring] 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 35 U.S.C. § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter "Revised 2019 Guidance, 84 Fed. Reg."). 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 activity 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)). 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 is not "well-understood, routine, conventional" in the field; 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 generally* 2019 Guidance, 84 Fed. Reg.; *see also* MPEP § 2106.05(d)).

Analysis under the Revised Guidance

Step 2A(1): Does claim 1 recite a judicial exception?

The Examiner finds that the claims are "directed to the abstract idea of data gathering and manipulation as well as mathematical relationship therewith," which the Examiner identifies as "mental processes." Final Act. 8; *see also* Ans. 5. In particular, regarding independent claim 1, the Examiner finds that the claim limitations may be performed "in the mind, but for the recitation of generic computer components," because the

limitations "encompass[] the user thinking about an optimized route taking into consideration a plurality of constraints." Ans. 4–5.

Appellant argues that the Examiner errs by generalizing the claimed invention. Br. 8. Appellant submits that "the claims are directed to computer-related technology and to methods and apparatus that at least improve upon exiting technological processes in a system for street level routing." *Id.* at 11.

The Revised Guidance provides that the abstract idea exception includes, as a grouping, "[m]ental processes–concepts performed in the human mind (including an observation, evaluation, judgment, opinion." Revised 2019 Guidance, 84 Fed. Reg. 52. Further, if a claim, under its broadest reasonable interpretation, covers performance in the mind but for the recitation of generic computer components, then it is still encompassed by the mental processes category unless the claim cannot practically be performed in the mind. *See Intellectual Ventures*, 838 F.3d at 1318 ("[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."); *see also Versata Development Group, Inc. v. SAP America, Inc.*, 793 F.3d 1306, 1335 (Fed. Cir. 2015) ("[C]ourts have examined claims that required the use of a computer and still found that the underlying, patent-ineligible invention could be performed via pen and paper or in a person's mind."); and *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375, 1372–73 (Fed. Cir. 2011) (holding that the incidental use of "computer" or "computer readable medium" does not make a claim otherwise directed to process that "can be performed in the human mind, or by a human using a pen and paper" is patent eligible).

Claim 1 recites, emphasis added: (i) "dividing a mapping of a geospatial region into a plurality of *sections*, the geospatial region having a plurality of job locations, each job location associated with at least one job, wherein the dividing comprises dividing the mapping so that each section of the plurality of sections is balanced, as measured by one or more of a job count and a job weight, with the other sections of the plurality of sections."[3]

The Specification discloses that quad-tree subdivision is "a simple form of subdivision in which routing areas can be subdivided using a quad-tree with balancing based upon statistics such as job count or weight." Spec. ¶¶ 46, 47. In particular, with reference to Figure 1A, the Specification describes "a method 100" that uses quad-tree subdivision to subdivide a geographic area containing the locations of a number of jobs "into a number of areas for balancing," for example, "by dividing a square," representing a single geographic area, "into four equal divisions as depicted," and further subdividing and combining the divisions and subdivisions based on an imbalance of a job count (i.e., the number of jobs) within a division or subdivision relative to other divisions or subdivisions (i.e., "an imbalance based on a deviation from a norm or average of the job count within each of the subdivisions"), until all of the divisions are balanced with respect to job

[3] Claim 1 recites "so that each section . . . is balanced, as measured by one *or more* of a job count and a job weight." Although the Specification's disclosure that Figures 1A and 1B depict "a simple form of a subdivision in which routing areas can be subdivided using a quad-tree with balancing based upon *statistics* such as job count or job weight," which may imply that the "or more," as recited in claim 1 refers to *statistics other than* job count and job weight, we construe the plain language of claim 1 as limiting the measurement for balancing the sections to job count and/or job weight. Spec. ¶ 47 (emphasis added).

count. *Id.* ¶ 48, Fig. 1A. We interpret the "divisions" and "subdivisions" described in the Specification as corresponding to the claimed "sections."

The Specification also describes "a method 140," with reference to Figure 1B, which first gives each of the same jobs contained in the geographic area of Figure 1A a number matching a job weight (i.e., based on a previously determined measure of priority or importance), which is represented on the geographic area of Figure 1B by a circle, triangle, star, or hexagon associated with the jobs. Spec. ¶ 49. The Specification discloses that method 140 continues by using quad-tree subdivision, again, to divide the square into four equal divisions, as depicted in Figure 1B, and next, balancing the sections according to the total value of the job weights within each division or subdivision relative to the other divisions and subdivisions, similar to the process of subdividing and combining as described with respect to method 100.

Although methods 100, 140 are disclosed in a section of the Specification titled, "*Automatic* Determination of Routing Areas" (Spec. ¶ 44) (emphasis added)), the Specification does *not* disclose that methods 100, 140 are performed by a computing device configured to perform quad-tree subdivision based on job count and/or job weight, as required by the preamble of claim 1: "[a] system . . . comprising a computing device configured for: [step] (i)"). *Cf.* Spec. ¶¶ 44, 117 (generally disclosing that "instructions, when executed by one or more computer processors, may be operable to perform that which is described in particular embodiments").

In view of the descriptions in the Specification, we find that step (i) of claim 1 can be performed in the human mind using pen and paper, for example, by dividing a mapping of a geospatial region containing job

locations into four quadrants or sections, counting jobs and/or totaling job weights within each section, and manually subdividing and/or combining sections to address any imbalances in either job counts or job weights relative to other sections and based on predetermined norms, to achieve a geospatial region having sections balanced by job count and/or job weight.

Claim 1 further recites, emphasis added: (ii) "dividing the mapping into a plurality of *cells*, each cell having one or more *pathways* located within the cell."

The Specification discloses that "before a route can be assembled, the cost of transitioning between *cells* within a region must be pre-determined," wherein "traversability between two cells is determined based upon both the major road networks within that area and the weight of a given segment;" for example, "the distance from a major road as well as the cost of transitioning to that road provide a cost weighting from getting from one cell to another." Spec. ¶ 29 (emphasis added). There is no other use of the claim term "cell" in the Specification, nor does the claim term "pathway" appear in the Specification as originally filed. In view of the Specification, we interpret a "road," which is traversable by a service representative to travel to service job locations via routes, as required by claim 1, as corresponding to the claimed "pathway."

The Specification discloses, more specifically and with reference to Figure 2, that "geographic and topologic elements can be used to further improve the subdivision process [by] weighting based on topological constraints" Spec. ¶ 51. In this respect, the Specification describes, with reference to Figure 2, "a method 200," which "can be implemented, for example, either after or in combination with other methods for subdividing

the geographic area in which jobs are located, such as either or both of method 100 and method 1[4]0," which "associat[es] relevant topological constraints for consideration . . . with a geographic area that includes job locations." *Id.* ¶¶ 52, 53. Method 200 includes "step 215" wherein the same geographic area as depicted in Figures 1A, 1B is "divided into a plurality of **zones** according to a weighting of traversability, which is shown in the example by a plurality of rectangular zones having irregular sizes, and each having a shading," wherein "[a] lighter shading represents an easier traversability, and a darker shading represents a more difficult traversability, relative to one another or relative to a predetermined actual or estimated or hypothesized norm, mean, or average of zones." *Id.* ¶ 54, Fig. 2 (step 215). The Specification discloses that

> the darkest depicted shading corresponds to one or more rectangular zones that are mostly are entirely occupied by a portion of a body of water that has no bridge or other roadway to traverse the body of water, resulting in low traversability. In a further example, the lightest depicted shading corresponds to one or more rectangular zones that include major roadway that provides high traversability.

Id.

Notably, the Specification discloses that "the boundaries of **zones** ordinarily are different from the boundaries of the **regions** discussed with regard to FIGS. 1A and 1B," and "the number of zones is not limited by the number of regions." Spec. ¶ 54. We interpret the "zones" as disclosed in the Specification as corresponding to the claimed "cells" recited in step (ii) of claim 1, because the Specification discloses dividing the mapping into zones (or cells) having roads, and the "regions" as disclosed in the

Specification as corresponding to the claimed "sections" recited in step (i) of claim 1.

Thus, in view of the Specification, we find that step (ii) of claim 1 can be performed in the human mind using pen and paper, for example, by manually indicating roads, as pathways, on the mapping of the geospatial region, and also manually dividing the mapping into zones—or cells, as claimed—having one or more pathways located within each cell.

Claim 1 further recites: (iii) "determining a traversability weighting for each of *the cells*, based at least on a traversability measure associated with the one or more *pathways* located within the respective cell, wherein each pathway has an individual measure of traversability."

As discussed *supra*, the Specification discloses that "zones of the geographic area are weighted according to a metric of traversability." Spec. ¶ 54. Also, as discussed *supra*, the Specification at least implies that the traversability measure is associated with roadways, each having an individual measure, for example, "the distance from a major road as well as the cost of transitioning to that road provide a cost weighting from getting from one cell to another." *Id.* ¶ 29.

Thus, in view of the Specification, we find that step (iii) of claim 1 can be performed in the human mind using pen and paper, for example, by determining a traversability weighting for each of the cells based on the ease or difficulty of traversing the cell via at least one pathway or road within the cell, based on the ease or difficulty of traversing the individual pathways.

Claim 1 further recites: (iv) "using one or more of the traversability weightings to further subdivide one or more of the plurality of *sections*."

The Specification discloses, with reference to Figure 2, that

> the four regions [(which correspond to the claimed sections and which are depicted in Figure 2 by dashed lines)], are subdivided based upon region weights. For example, each job location can be assigned a weighting based upon the zone of traversability [(which corresponds to the traversability weight for each of the claimed cells)] in which the job is located. A weighting for each region (e.g., quadrant) can be determined, for example, from a weighting of the job locations within the region, e.g., by a total or an average of the traversability weights for the job locations within the region. . . . Based on weighting of traversability associated with job locations in each region[,] the depicted subdivision of three of the regions was determined based on existence of weighting imbalance among all four regions. . . . [I]f the regions remain imbalanced, further adjustment and optimization can be performed; for example, by further subdivision of regions, or by adjusting the position or shape of the previous subdivisions.

Spec. ¶ 54.

Thus, similar to claim limitation (i), in view of the Specification, we find that step (iv) of claim 1 can be performed in the human mind using pen and paper, for example, by weighting and totaling the jobs within a region or *section* according to a traversability weight *for the cells*, as determined in step (iii) of claim 1, in which the job is located, and performing a manual adjustment by further subdividing the *sections*, for example, by adjusting the position or shape of previous subdivisions.

Notably, nothing further is required with respect to the *sections* recited in claim 1. In other words, after dividing the mapping into balanced sections pursuant to step (i), based on job count and/or job weight, and further using traversability weightings relative to the cells to additionally subdivide the sections pursuant to step (iv), the divided sections are no longer used as a basis to perform any additional claim steps.

Claim 1 further recites, emphasis added: (v) "pre-calculating total weights associated with one or more *routes* for traversing every *cell* to every other *cell*, wherein each total weight is calculated based at least on the traversability weightings of a start cell, an end cell, and any intermediate cells in a route between the start cell and the end cell."

We find that step (v) of claim 1 can be performed in the human mind using pen and paper, for example, by determining a route and, next, totaling the traversability weightings of each cell, as determined in step (iii) of claim 1, traversed along the route, for example, by adding the traversability weightings of the start, intermediate, and end cells that form the route, and further, doing so as a pre-calculation (i.e., before service representatives are assigned to any routes).

Claim 1 further recites: (vi) "using one or more of the pre-calculated total weights to determine one or more routes between a first point and a second point in the geospatial region, the first point mapped in a first cell and the second point mapped in a second cell."

We find that using one of the pre-calculating total weights, as determined in step (v) of claim 1, to determine one or more routes between first and second points in first and second cells mapped onto the geospatial region can be performed in the human mind using pen and paper.

Claim 1 further recites: (vii) "determining one or more preferred routes in accordance with a ranking of one or more routes between the first cell and the second cell, the ranking based on one or more efficiency criteria."

The Specification discloses that "[r]outes must be determined for each technician such that all jobs are serviced with optimal routes being selected

based upon a set of control parameters," wherein "[t]hese criteria include factors such as total travel time and distance." Spec. ¶ 30.

We find that determining that one of the routes determined pursuant to step (vi) of claim 1 is preferred based on ranking one or more routes by considering, for example, an efficiency criteria (i.e,. its pre-calculated total weight pursuant to step (v) of claim 1) is a step that can be performed in the human mind using pen and paper.

Thus, we determine that claim 1 recites the mental process of determining a preferred route between a first point in a first cell and a second point in a second cell on a geospatial region by considering the traversability of pathways within the cells and along the route, and further, *separately,* subdividing a mapping into sections with job locations having associated job counts, weights, and traversability weightings. *See* Spec. ¶ 30 ("Routes must be determined for each technician such that all jobs are serviced with optimal routes being selected based on control parameters."); *id.* ¶ 32 ("[T]he solution should provide an ability to simulate the outcomes of certain choices."). We agree with the Examiner that the claimed steps (i) to (vii) are concepts that can be performed in the human mind—mentally or with pen and paper. *See* Ans. 4–5. Indeed, the Specification does not disclose that a machine or computing device is required to perform any of (i) to (vi), but rather, as discussed *supra*, the Specification describes manually performing quad-tree subdivision and calculating certain parameters, and further, only generally refers to "instructions, when executed by one or more computer processors, may be operable to perform that which is described in particular embodiments." *Id.* ¶ 117.

We are also not persuaded by Appellant that this determination generalizes the claimed invention, or that the limitations of claim 1 improve a technological process. As demonstrated *supra*, we have considered each of the specific limitations of claim 1 from step (i) to (vii), and the technological process is merely instructions for subdividing a map and determining a preferred route between cells based on certain calculations. Moreover, Appellant does not present any argument or evidence that steps (i) to (vii) of claim 1 cannot be performed practically in the human mind using pen and paper.

Step 2A(2): Is the judicial exception integrated into a "practical application"?

Because the claims recite a patent-ineligible concept, we proceed to the "practical application" Step 2A, second prong, in which we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application. The Revised 2019 Guidance is "designed to more accurately and consistently identify claims that recite a practical application of a judicial exception[] and thus are not 'directed to' a judicial exception." *See* Revised Guidance, 84 Fed. Reg. 53. More particularly, we evaluate the claims to determine whether the claims recite: (i) an improvement to the functionality of a computer or other technology or technical field (*see* MPEP § 2106.05(a)); (ii) a "particular machine" to apply or use the judicial

exception (*see* MPEP § 2106.05(b)); (iii) a particular transformation of an article to a different thing or state (*see* MPEP § 2106.05(c)); or (iv) any other meaningful limitation (*see* MPEP § 2106.05(e)). *See also* Revised Guidance, 84 Fed. Reg. 55.

The Examiner finds that the additional claim limitations, for example, (viii) a routing engine and (ix) a dashboard, do not integrate the mental process into a practical application, because these claim limitations involve generic computer components, which do not impose any meaningful limits on practicing the abstract idea. Ans. 5–6. In particular, the Examiner finds that the claimed routing engine is "a generic processor performing a generic computer function of generating an initial assignment using the one or more preferred route" and that the claimed dashboard is "a generic interface for controlling a generic computer." *Id.* at 6.

Here, the following limitations of claim 1 are *in addition to* the limitations discussed *supra* (i.e., steps (i) to (vii)), which recite a mental process:

> "[a] system . . . comprising a computing device configured for:
>
> . . .
>
> [(viii)] *a routing engine*, using the one or more preferred routes to generate an initial assignment of a service representative to travel to a first job location associated with the first point, the service representative selected from a pool of service representatives, wherein the service representative is assignable to travel to a plurality of service job locations associated with the one or more preferred routes; and
>
> [(ix)] *a dashboard* comprising one or more controls for controlling the routing engine in assigning the service representative to travel to one or more of the plurality of service job locations associated with the one or more preferred routes.

The Specification discloses, *inter alia*, that "a routing engine is able to continually seek optimizations and respond to events that occur" (Spec. ¶ 40), by "updating routes and sending notifications as appropriate to maximize efficiency in the updated model," wherein "[t]he routing engine will attempt to compensate for the change in circumstances while making the minimum amount of changes to maintain route stability wherever possible" (*id.* ¶ 42). *See also id.* ¶ 113 (with reference to "Event-Based Adjustments: Just as a human dispatcher responds to events such as canceled appointments, technicians stuck in traffic, and jobs that overrun, the routing engine can follow a predetermined business process to adapt and respond to those events. The artificial intelligence engine can use[] answers to business model questions to determine the correct course of action to take for a set of pre-determined events."). The Specification also discloses that "the routing engine presents possible choices to a human dispatcher in order to reach a resolution." *Id.* The Specification further discloses, with reference to "**Neighbor Optimizations (Regional Trades),**" "[t]he routing engine considers the relative benefits of each trade and will exercise those with benefits above a predetermined threshold," wherein "threshold values are determined from the control parameters provided as part of the business rules for the engine". *See id.* ¶¶ 94–95, 101 ("[t]he engine will calculate the weight of benefits and drawbacks of any potential change"). Finally, the Specification discloses that "many of the steps taken by the routing engine are performed in the background by one or more computer processors (e.g., in one or more servers), and do not rely upon direct human input." *Id.* ¶ 103.

As an initial matter, step (viii) of claim 1 merely requires the routing engine to use a preferred route to generate an initial assignment of a service

representative assignable to travel the preferred route—claim 1 does not require the routing engine to perform the many tasks discussed in the Specification *supra*. We determine that generating an initial assignment, as claimed, can be performed practically in the mind by mentally choosing an initial assignment using preferred route information given an assigned pool of service representatives, but for the recitation of generic computer components (i.e., a routing engine, such as a computer processor in a server). Thus, we find that step (viii) does not integrate the mental process of claim 1 into a practical application of the mental process.

Regarding a dashboard with controls for controlling the routing engine in making such an assignment as claimed, the Specification discloses that "business process control parameters are configured via a dashboard 1800 that can be used, e.g., by system administrators to configure and control the routing engine." Spec. ¶ 108. Thus, the dashboard is an interface for controlling the routing engine to use one of the preferred routes to generate an initial assignment. We find that a user interface is a generic computing component, and therefore, step (ix) does not integrate the mental process of claim 1 into a practical application of the mental process.

Accordingly, claim 1 is directed to the mental process of determining and assigning a preferred route between first and second points in first and second cells on a geospatial region representative of a service route, by considering the traversability of pathways within the cells and along the route, and further, *separately*, subdividing a mapping into sections with job locations having associated job counts, weights, and traversability weightings.

Step 2B: Does claim 1 recite an "inventive concept" or "significantly more"?

If the claims are directed to a patent-ineligible concept, as we conclude *supra*, we proceed to the "inventive concept" step. For *Step 2B* we must "look with more specificity at what the claim elements add, in order to determine 'whether they identify an "inventive concept" in the application of the ineligible subject matter' to which the claim is directed." *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016)). In other words, we look to see whether there are any "additional features" in the claims that constitute an "inventive concept," thereby rendering the claims eligible for patenting even if they are directed to an abstract idea. *Alice*, 573 U.S. at 221. Those "additional features" must be more than "well-understood, routine, conventional activity." *Mayo*, 566 U.S. at 79. Limitations referenced in *Alice* that are not enough to qualify as "significantly more" when recited in a claim with an abstract idea include, as a non-limiting or non-exclusive examples, requiring no more than a generic computer to perform generic computer functions that are well-understood, routine and conventional activities previously known to the industry. *Alice*, 573 U.S. at 225 (*e.g.*, using a computer to obtain data, adjust account balances, and issue automated instructions).

The Examiner finds that

> [the claims do] not include additional elements that are sufficient to amount to significantly more than the judicial exception . . . because the computing device, the routing engine, and the non-transitory medium as recited are generic computer component[s] that perform[] generic computer functions (i.e., dividing, weighting, pre-calculating, generating, and determining). These

> are generic computer functions that are well-understood, routine and conventional activities previously known to the industry.

Id. at 8–9; *see also* Ans. 6 (citing Spec. ¶¶ 119, 120, 134 (for describing "the computing device, the routing engine and the dashboard as generic computer components")). In sum, the Examiner finds that "[t]he claims do not amount to significantly more than the abstract idea of computing data," and more particularly, as reciting "basic mathematical relationships or formulas." *Id.* at 9.

As an initial matter, Appellant argues that because the Examiner withdrew all of the rejections based on the prior art, the Examiner acknowledges that the pending claims recite subject matter that is novel and nonobvious, and therefore, the claims cannot be directed to well-understood, routine, or conventional activities.[4] Br. 5. We are not persuaded by Appellant's argument, however, because any analysis based upon anticipation or obviousness is not relevant to our analysis for patent eligibility under 35 U.S.C. § 101. In other words, although our analysis for patent eligibility under 35 U.S.C. § 101 involves a search for an inventive concept, the analysis is not directed to novelty or nonobviousness, but rather for elements sufficient to ensure that the claimed invention is directed to more than a patent ineligible concept, such as an abstract idea. *See Alice*, 573 U.S. at 217–18. "Groundbreaking, innovative, or even brilliant discovery does not by itself satisfy the [35 U.S.C.] § 101 inquiry." *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 591 (2013); *see also Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981) ("The 'novelty' of

[4] *See, e.g.*, Non-Final Rejection (dated Sept. 19, 2017) (withdrawing a rejection of claims 1–4, 8, 9, 13, 14, and 18 under 35 U.S.C. § 102(a)(1) as being anticipated by Delling (US 2013/0231862 A1; published Sept. 2013)).

any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the [35 U.S.C.] § 101 categories of possibly patentable subject matter."); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1263 n.3 (Fed. Cir. 2016) (noting that an eligibility finding does not turn on the novelty of using a user-downloadable application for the particular purpose recited in the claims).

Appellant also argues that the claims, "both implicitly and expressly, require the use of technology that is **significantly more** than a generic computing device," including, for example, "a routing engine that, in an embodiment of the claims, performs steps of the claims in the background by one or more computer processors (e.g., in one or more servers)." Br 8 (citing Spec. ¶ 103). Appellant submits that the routing engine is "configured for a specific purpose," as further recited in the claims, and is therefore, "not merely" a generic computing element. *Id.* Appellant further submits that the claims "become something significantly more than an abstract idea when they are implemented in a specific form, using technology in a way that influences the outcome, and creating results that are more sophisticated than that which would result from application of a mere abstract idea." *Id.*

Appellant further argues that to the extent the claimed subject matter is found to be well-understood, routine, or conventional activities, the Examiner has failed to provide factual support for such findings, as required by the Berkheimer Memo (USPTO, Memorandum on Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent

Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*) (Apr. 19, 2018)). Br. 5–8.

We are not persuaded by Appellant's arguments. We have considered the additional limitations both individually and as an "ordered combination." *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016) (If this threshold determination is met, we move to the second step of the inquiry and "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application."). As set forth *supra*, the routing engine is described in the Specification as a processor, and the dashboard, as an interface. Thus, the Specification itself provides support for the Examiner's finding that the routing engine and dashboard are *conventional* computing components being used according to their *conventional* computing functions.[5] In other words, we agree with the Examiner that the *additional* features, namely, the use of the routing engine and dashboard to generate an initial assignment, or to control the routing engine to do so, when considered individually and as an ordered combination, represent well-understood, routine, conventional activity.

Accordingly, we sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 101, and claims 2–18 fall therewith.

[5] We are instructed that "[r]elying on the specification alone may be appropriate where, as in *Mayo*, the specification admits as much." *Berkheimer*, 890 F.3d at 1371.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Basis/Reference(s)	Affirmed	Reversed
1–18	101	Eligibility	1–18	
Overall Outcome			1–18	

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