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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte OLLI PENTIL PETTERI SEPPANEN, KAJ MIKAEL
BJORKLUND, and ILKKA PENTIL SAMUIL PELKONEN

Appeal 2010-000271
Application 11/375,871
Technology Center 2100

Before: MAHSHID D. SAADAT, JUSTIN BUSCH, and
MIRIAM L. QUINN, *Administrative Patent Judges*.

BUSCH, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a rejection of claims 1-21. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Introduction

According to Appellants, the invention relates to a location-based construction planning and scheduling system.

STATEMENT OF THE CASE

Exemplary Claims

Claims 1 and 20, reproduced below, are illustrative of the claimed subject matter:

1. A system for location-based management of construction comprising:
 - a first layer locations system generating one or more first layer locations where construction activities can be performed in parallel;
 - a second layer locations system generating one or more second layer locations where construction activities can be performed in parallel for one or more of the first location;
 - a third layer locations system generating third layer locations where construction activities can be performed in parallel for one or more of the second layer locations;
 - a construction activity location system associating each of a plurality of construction activities with one of the first layer locations, the second layer locations, or the third layer locations;
 - a construction activity association system associating one or more of the plurality of construction activities with one or more of the other construction activities; and
 - a construction sequence system generating a sequence of construction activities based on the layer location associated

with each construction activity and based on the other construction activities associated with that construction activity.

20. An apparatus for location based construction planning comprising:

means for generating a plurality of locations where construction activities can be performed in parallel;

means for associating each of a plurality of construction activities with one of the plurality of locations;

means for associating one or more of the plurality of construction activities with one or more of the other construction activities; and

means for generating a sequence of construction activities based on the location associated with each construction activity and based on the other construction activities associated with that construction activity.

Reference

Zhaoyang Ma et al., *Application of 4D for Dynamic Site Layout and Management of Construction Projects*, *Automation in Construction* 14 (2005) 369-381 (hereinafter "Ma").

Rejections

Claims 1-21 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. Ans. 2-3.

Claims 1-19 and 21 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Ans. 3.

Claims 1-21 stand rejected under 35 U.S.C. § 102(b) as anticipated by Ma. Ans. 4.

ISSUE 1

Appellants argue that claims 1-21 are directed to statutory subject matter. App. Br. 10-12; Reply 3-4.

Issue 1a: Has the Examiner erred in determining that claims 1-9 are directed to non-statutory subject matter?

Issue 1b: Has the Examiner erred in determining that claims 10-19 are directed to non-statutory subject matter?

Issue 1c: Has the Examiner erred in determining that claims 20 and 21 are directed to non-statutory subject matter?

ANALYSIS

The Examiner rejects claims 1-21 as being directed to non-statutory subject matter because the claims “merely recite an abstract idea.” Ans. 3-4.

Appellants argue that claims 1-9 are directed to statutory subject matter because the claims include systems that generate various data. Appellants reference their Specification, stating that the Specification “defines a ‘system’ as being implemented in hardware, software or a suitable combination of hardware and software, and which can be one or more software systems operating on a general purpose processing platform.” App. Br. 11; Reply 4. Appellants then argue that, because the system claims “include terms such as ‘generating’ and ‘associating,’ [the claims] are not drawn to software code in the abstract, but rather to the disclosed embodiment of software systems operating on a general purpose processing platform, which are statutory subject matter.” App. Br. 11; *see* Reply 4. Appellants further argue that the Examiner is importing material from the

specification into the claims because the specification does not disclose a “system that is ‘purely a software system.’” Reply 4; *see* App. Br. 11.

We note that claims 1-9 are drawn to systems; Appellants do not recite any hardware in claims 1-9. As stated above, according to Appellants, a system “can be implemented in hardware, **software**, or a suitable combination of hardware and software.” Spec. p.6 ll. 23-26; *see also* App. Br. 11 (emphasis added). “A claim that covers both statutory and non-statutory embodiments (under the broadest reasonable interpretation of the claim when read in light of the specification and in view of one skilled in the art) embraces subject matter that is not eligible for patent protection and therefore is directed to non-statutory subject matter.” MPEP § 2106. The Examiner is not importing material from Appellants’ Specification, but simply construing the claim broadly, but reasonably, in light of the Specification. We agree with the Examiner’s construction, and, thus, we agree with the Examiner that claims 1-9 are not directed to statutory subject matter because the claims read on a system that is fully implemented in software.

With respect to claims 10-19, Appellants argue that the claims are directed to statutory subject matter because “method claims 10-19 are drawn to a method that is both tied to a particular machine or apparatus and that transforms a particular article into a different state or thing.” App. Br. 11. Appellants state that the method claims are directed to (1) associating construction activities with location-based tasks and with layer locations and (2) “sequencing the location-based tasks.” App. Br. 11. Appellants then assert that, because “[c]onstruction activities involve both particular machines and apparatuses, and transform raw building materials into a

different state or thing,” the method is tied to a particular machine and transforms a particular article. App. Br. 11.

However, none of the claimed method steps relate to executing the construction activities, which Appellants allege are tied to machines and/or transform articles. As explained by Appellants, the claimed method steps order a series of tasks. Appellants have not shown how performing these tasks are tied to a machine or transform anything other than rearranging information related to construction activities. Moreover, Appellants method claims 10-19 relate to generating and associating information and, therefore, are merely abstract ideas. Our reviewing court guides that “a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101.” *Cybersource*, 654 F.3d at 1373. Because we conclude that the scope of Appellants’ claimed method steps covers functions that can be performed in the human mind, or by a human using a pen and paper (e.g., a database table represented using pen and paper), we conclude that claims 10-19 are not directed to statutory subject matter.

Regarding claims 20 and 21, Appellants argue that the claims are directed to statutory subject matter because Appellants’ Specification provides structure that the Examiner improperly ignored. App. Br. 10. The Examiner finds that claims 20 and 21 are directed to non-statutory subject matter because, in at least one embodiment disclosed by Appellants, the invention would be comprised completely of software. Ans. 9. We agree with Appellants. We note the guidelines provided in the MPEP:

Often the supporting disclosure for a computer-implemented invention discusses the implementation of the functionality of the invention through hardware, software, or a combination of both. In this situation, a question can arise as to which mode of

implementation supports the means-plus-function limitation. The language of 35 U.S.C. 112, sixth paragraph requires that the recited “means” for performing the specified function shall be construed to cover the corresponding “structure or material” described in the specification and equivalents thereof. Therefore, by choosing to use a means-plus-function limitation and invoke 35 U.S.C. 112, sixth paragraph, applicant limits that claim limitation to the disclosed structure, i.e., implementation by hardware or the combination of hardware and software, and equivalents thereof. **Therefore, the examiner should not construe the limitation as covering pure software implementation.**

However, **if there is no corresponding structure disclosed in the specification** (i.e., the limitation is only supported by software and does not correspond to an algorithm and the computer or microprocessor programmed with the algorithm), **the limitation should be deemed indefinite as discussed above, and the claim should be rejected under 35 U.S.C. 112, second paragraph.** It is important to remember that claims must be interpreted as a whole; so, a claim that includes a means-plus-function limitation that corresponds to software per se (and is thus indefinite for lacking structural support in the specification) is not necessarily directed as a whole to software per se unless the claim lacks other structural limitations.

MPEP § 2181 II.B. (emphases added). We therefore reverse the Examiner’s rejection of claims 20 and 21 under 35 U.S.C. § 101, but note that, in the event of further prosecution, the Examiner may wish to consider whether a rejection under 35 U.S.C. § 112, second paragraph, is warranted.

ISSUE 2

Appellants argue that claims 1-19 and 21 do not omit matter disclosed to be essential to the invention as described and that no claim terms in claim 21 are indefinite. App. Br. 12-13; Reply 4-6.

Issue 2: Has the Examiner erred in rejecting claims 1-19 and 21 as being indefinite under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention?

ANALYSIS

The Examiner finds that claims 1-19 are “indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention,” because the claims omit “essential elements, such omission amounting to a gap between the elements.” Ans. 3. The Examiner bases this finding on one technical advantage identified in Appellants’ Specification and subsequently poses a series of questions regarding how the limitations are carried out by Appellants’ invention. Ans. 3, 10-11.¹ The Examiner also finds that the terms “quantity item code,” “quantity item task,” and “template quantity item code,” which are recited in claim 21, are not defined and that claim 21 is, therefore, indefinite.

Appellants argue that the Examiner’s rejection is only proper when a claim “omits matter disclosed to be essential to the invention as described in the specification, or where a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification.” App. Br. 12. Appellants also assert that the Examiner’s questions “appear to relate more to enablement than to omitted essential elements.” Reply 5. With

¹ Appellants assert in their Reply Brief that the Examiner does not appear to address any claims other than claims 12 and 13 with respect to the 35 U.S.C. § 112 rejection. Reply 4-5. However, it is clear from other headings and the Examiner’s statements that the Examiner’s heading, “Appellant argues the 112 2nd rejections on claims 12-13,” is a typo and was intended to read “Appellant argues the 112 2nd rejections on **pages** 12-13.” Ans. 10.

respect to claim 21, Appellants argue that no special definition is required and that the ordinary meaning should be used. App. Br. 13.

We agree with Appellants' contentions and find that the Examiner's rejection of claims 1-19 under 35 U.S.C. § 112 is improper. We also agree with Appellants that the ordinary meaning of the disputed terms apply and find that the Examiner's rejection of claim 21 under 35 U.S.C. § 112, second paragraph, is also improper.

ISSUE 3

Finally, Appellants assert that Ma does not disclose the limitations recited in claims 1-21.

Issue 3: Has the Examiner erred in determining that Ma discloses each limitation of the claims?

ANALYSIS

Claim 1

Appellants initially argue that the Examiner improperly cites a single statement in Ma for each of the first three claim elements of independent claim 1. App. Br. 13. Appellants repeatedly assert that the portions of Ma cited by the Examiner and the Examiner's findings are not pertinent to the three recited limitations relating to location systems generating layer locations where construction activities can be performed. App. Br. 14-16. Appellants also argue that the cited portions of Ma suggest that Ma is merely "a single system that receives a first set of data . . . and which generates a second set of data." App. Br. 14. Appellants conclude that Ma "fails to disclose anything more than incidental location data" and "lacks even the

rudimentary data that would be needed to provide” the claimed limitations relating to systems that generate layer locations. App. Br. 16.

After challenging the citations provided by the Examiner throughout prosecution of the instant application, Appellants appear to allege that the Examiner reads the three recited limitations relating to systems that generate layer locations on a building, and its components. App. Br. 16 (“A building is not the claimed systems, it is merely a building.”). Appellants continue this argument in their Reply Brief, asserting that the Examiner’s construction reads out portions of the claim limitations. Reply 7. Appellants argue that the claims recite “three systems that are functionally interrelated” and that Ma’s system does not discuss either a requirement “to identify locations where construction activities can be performed in parallel” or “how to perform activities in parallel.” App. Br. 16-17.

Appellants also argue that the WBS tree “does not disclose a construction activity location system associating each of a plurality of construction activities with one of the” layer locations and that the WBS tree also “is not a construction activity association system, based on the definition of a system provided in the specification, or even based on the plain language of the claim.” App. Br. 17. Finally, Appellants argue that Ma does not disclose the recited “construction sequence system.” App. Br. 18. Appellants state that Section 2.3 of Ma “describes the functionality of the 4D-ISPS program as being able to allow managers ‘to make analysis to solve resource conflicts or reduce project duration using CPM or PERT methods,” and argue that this shows that Ma’s “4D-ISPS does not prevent resource conflicts or reduce project duration,” both of which are accomplished by claim 1. App. Br. 18. Appellants argue that Ma supports

their arguments because Ma discloses that “such optimization must be manually performed.” App. Br. 18.

The Examiner explains that Ma is related to “4D dynamic site layout and management,” and that the citation to the “building, its storeys and units, and standard elements” shows that the system of Ma takes that information and generates construction site layout information, which the Examiner finds meets the three recited limitations. Ans. 11. The Examiner also finds that Ma discloses using the system to generate work space requirements of activities and schedule information. Ans. 11-12. Specifically, the Examiner maps: (a) generating the construction site layout information related to the building in Ma to the claimed limitation of generating first layer locations; (b) generating the construction site layout information related to the storeys and units in Ma to the claimed limitation of generating the second layer locations; and (c) generating the construction site layout information related to the standard elements in Ma to the claimed limitation of generating the third layer locations. Ans. 12. The Examiner also finds that the broadest reasonable interpretation of these claimed layers, in light of the Specification, reads on the set of information related to the identified portions of the buildings in Ma. Ans. 12. The Examiner also finds that “Figure 3 of Ma illustrates parallel activities” and that Table 1 of Ma associates locations with work activities. Ans. 13. Finally, the Examiner finds that Appellants’ arguments directed to “elements which are not claimed,” specifically the arguments regarding “the prevention of resource conflicts and project reduction,” are not relevant. Ans. 13.

Appellants challenge the portions of Ma cited by the Examiner without considering the reference as a whole to provide context for the cited

portions. As explained by the Examiner, Ma is “a 4D Integrated Site Planning System (4D-ISPS) which integrates schedules, 3D models, resources and site spaces together with 4D CAD technology to provide 4D graphical visualization capability for construction site planning.” Ma Abstract. Given that context, it is clear that the Examiner is not equating a building (or the different locations of a building site) to three separate systems. Rather, as the Examiner explains, Ma’s 4D-ISPS is a construction site planning system that identifies different locations within the construction site to create a hierarchical tree for purposes of planning the construction. Ma provides information related to these sets of locations (referred to by Appellants as “layer locations”) and generates data to assist in performing construction in these locations. Therefore, we agree with the Examiner that Ma discloses the limitations of claim 1 relating to systems for generating location layers where construction activities can be performed in parallel.

We further agree with the Examiner’s conclusion that the claims do not require the construction activities be performed in parallel. Rather, the claims recite that the “construction activities **can be** performed in parallel.” Appellants acknowledge that the information in Ma provides for a building that “may have been built with activities in parallel.” App. Br. 16. Therefore, we find Appellants’ arguments attacking Ma for failing to disclose “how to perform activities in parallel” unpersuasive.

We are not persuaded by Appellants’ arguments regarding the limitations relating to the “construction activity location system,” the “construction activity association system,” and the “construction sequence system,” and we adopt the Examiner’s findings and conclusions. The

portions of the Ma reference cited by the Examiner, when viewed in context of the reference, disclose a construction system that associates construction activities with site locations and other activities and generates a sequence of construction activities based on that information, such that the disclosed system meets the recited limitations of claim 1. We further note that Appellants have pointed to their flowcharts, figures, and algorithms as providing the disclosure for their claimed systems. The Examiner has relied on similar aspects (tables, charts, algorithms, known CAD and MS Project functions/algorithms) of Ma as disclosing the claimed elements. Thus, Ma discloses the claimed features to the same extent Appellants' own Specification describes those elements.

Claim 10

Appellants argue that “[t]he Examiner has not even attempted to show that Ma discloses the claimed method steps in the order required by the claims.” App. Br. 22. Appellants argue that Ma allows for a building that could “have been built one step at a time, with nothing being done in parallel” or that the activities could have been done without carrying out the method steps in the order required. App. Br. 23. Appellants also assert that the section of Ma cited by the Examiner does not disclose the claimed method in the order required for the remaining steps in claim 10.

Appellants' arguments are not persuasive. Appellants' claim 10 is a method claim that is commensurate in scope with the system claim. We find that the elements of the method claim are present in Ma for the same reasons as discussed above with respect to claim 1. With respect to Appellants' arguments regarding ordering of method steps, method steps only need to be

shown in order when the claim requires a specific order. Appellants' claim 10 recites that "for each first layer location, generating second layer locations . . . and for each second layer location, generating third layer locations." These steps require that each of the prior locations is present prior to generating the next location. However, the sections cited by the Examiner also require such a relationship. As can be seen in the WBS tree, the layers referenced in Ma are hierarchical and, therefore, the lower level "layer locations" must be generated prior to the upper level "layer locations." Similarly, the step of associating activities with the layer locations merely requires that the layer locations have already been generated. However, once again, the cited portions of Ma disclose a similar association, which cannot be done without having first generated the location layers. To the extent the method claimed steps require order, that order is also present in Ma. Therefore, we affirm the Examiner's rejection of claim 10.

Claims 2-9 and 11-19

With respect to claims 2-5 (and claims 11-14), Appellants argue that it is "impossible to determine what is meant by" Start-to-Start and Finish-to-Start dependencies and that, if the claimed limitations are done, they are executed manually. App. Br. 19. However, with respect to claims 3 and 5, Appellants contradict their position by stating that "Ma discloses 'Start to Start' and 'Finish to Start,' but there is no mention whatsoever of 'Start to Finish'" or Finish to Finish. App. Br. 19.

The Examiner finds that the dependencies explained in Ma are “basic construction management terminology” and that these dependencies “represent the order of construction activities.” Ans. 13.

We agree with the Examiner’s findings and conclusions. The “Start-to-Start” and “Finish-to-Start” dependencies disclosed by Ma meet the limitations recited in claims 2 and 4, respectively. Moreover, the “Start-to-Start” and “Finish-to-Start” dependencies disclosed by Ma also meet the limitations recited in claims 3 and 5, respectively. Regarding claim 3, it is clear that a “Start-to-Start” dependency meets the limitation recited in claim 3, because such a dependency requires that task A be started before task B is started; necessarily, task A must then be started before task B is finished, because task B cannot be finished if it hasn’t been started. Similar analysis applies with respect to claim 5.

With respect to claims 6-8 (and claims 15-18), Appellants argue that no portion of Ma cited by the Examiner meets the recited limitations. App. Br. 20-21. Appellants also argue that the cited portions of Ma relevant to claim 8 (and claim 18) must be done manually. App. Br. 21. These claims merely recite that the tasks “can be continuously performed.” Under the broadest reasonable interpretation of these claims we agree with the Examiner that Ma discloses the limitations. Specifically, there is nothing in the disclosure of Ma that would prevent the tasks from being continuously performed.

With respect to claim 9 (and claim 19), Appellants argue that Ma does not disclose “adjusting durations of all critical path method activities,” as recited in claim 9. App. Br. 21-22. The Examiner finds that Ma discloses estimating the duration of each task based on various factors. Ans. 14. We

agree with the Examiner. As the factors upon which the task-duration estimation is based change, the estimation of the duration will be altered.

Therefore, for the reasons discussed above, we agree with the Examiner that Ma discloses each of the limitations in claims 2-9 and 11-19.

Claims 20 and 21

Appellants assert that the portions of Ma relied on by the Examiner in rejecting claims 20 and 21 “ignore the corresponding structure disclosed in the specification.” App. Br. 26. Appellants then argue that claim 20 is not anticipated by Ma because “the Examiner has not made any attempt to address the structure disclosed in the specification or to identify any allegedly identical or similar structure in Ma.” App. Br. 28. With respect to claim 21, Appellants also rely on an argument that “the Examiner relies on functional descriptive material, and has failed to comply with M.P.E.P. 2181.” App. Br. 29

For purposes of this appeal, we agree with Appellants to the extent that the algorithms disclosed by Appellants in their Specification are broad, but sufficient to “render the bounds of the claim understandable to one of ordinary skill in the art.” *Allvoice Computing v. Nuance Comm.*, 504 F.3d 1236, 1245 (Fed. Cir. 2007). However, we find that the system disclosed in Ma and the portions of Ma cited by the Examiner would have been understood by one of ordinary skill in the art to meet Appellants’ claimed structure. Specifically, the system of Ma has the necessary computers, data structures, and components and must implement the same or equivalent algorithms in order to complete the comparison and scheduling disclosed

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within Ma. As discussed above, these functional aspects disclosed in Ma have been found to meet the functional limitations claimed by Appellants.

DECISION

The Examiner's rejection of claims 1-19 under 35 U.S.C. § 101 is affirmed.

The Examiner's rejection of claims 20 and 21 under 35 U.S.C. § 101 is reversed.

The Examiner's rejection of claims 1-19 and 21 under 35 U.S.C. § 112 is reversed.

The Examiner's rejection of claims 1-21 under 35 U.S.C. § 102(b) 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

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