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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ILYA BARAN, LINJIE LUO,
and WOJCIECH MATUSIK

Appeal 2016-007695
Application 13/585,383¹
Technology Center 2100

Before MICHAEL J. STRAUSS, IRVIN E. BRANCH, and
MICHAEL J. ENGLE, *Administrative Patent Judges*.

ENGLE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1–6, 8–15, and 17–20.² We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE and enter a NEW GROUND OF REJECTION UNDER 37 C.F.R. § 41.50(b).

Technology

The application relates to “recursively partitioning a 3D model of an object into two or more components such that each component fits within a predefined printing volume.” Spec. Abstract.

¹ According to Appellants, the real party in interest is Disney Enterprises, Inc., a subsidiary of The Walt Disney Company. App. Br. 3.

² Independent claims 7 and 16 were indicated as allowable. Final Act. 13.

Illustrative Claim

Claim 1 is illustrative and reproduced below with the limitations at issue emphasized:

1. A computer-implemented method for recursively partitioning a 3D model of an object into two or more components such that each component fits within a predefined printing volume, comprising:

determining, via one or more processors, a set of planar cuts, wherein each planar cut partitions the 3D model into at least two components;

evaluating one or more objective functions for each cut in the set of planar cuts;

selecting a cut from the set of planar cuts based on the evaluations of the objective functions; and

upon determining that one or more of the at least two components resulting from the selected cut does not fit within the predefined printing volume, further partitioning the one or more components that do not fit within the predefined printing volume.

Rejection

Claims 1–6, 8–15, and 17–20 stand rejected under 35 U.S.C. § 103(a) as obvious over the combination of Xin et al., *Making Burr Puzzles from 3D Models*, ACM Transactions on Graphics, Vol. 30, No. 4, Article 97 (2011); Medellin et al., *Automatic Subdivision and Refinement of Large Components for Rapid Prototyping Production*, 7 J. Computing & Info. Sci. in Eng'g 249 (2007); Nguyen et al., *Best Cuts of a Set of Hyperrectangles (Extended Abstract)*, 9th Euro. Workshop on Computational Geometry CG '93, pp. 1–5 (1993); and known practices in the art. Final Act. 2.³

³ The rejection under 35 U.S.C. § 102 was withdrawn. Ans. 3.

ISSUE

Did the Examiner err in finding the combination of Xin and Medellin teaches or suggests “upon determining that one or more of the at least two components resulting from the selected cut does not fit within the predefined printing volume, further partitioning the one or more components that do not fit within the predefined printing volume,” as recited in claim 1?

ANALYSIS

The Examiner relies on the combination of Xin and Medellin for teaching the “upon determining” step in independent claims 1, 11, and 19. Ans. 10–12; Final Act. 7–8. However, we agree with Appellants that “Medellin subdivides a component using a ‘regular 3D lattice.’” Reply Br. 9 (emphasis omitted). This 3D lattice “allows the component to be subdivided into multiple pieces . . . *in one step*,” as “shown in, e.g., Medellin figure 4(a).” *Id.* (emphasis added, original emphasis omitted). Thus, Medellin selects and performs multiple simultaneous cuts once, whereas the claims require selecting one cut, determining if further partitioning is necessary, and performing further partitioning. *See* Medellin 251, Fig. 4(a).

The Examiner has not sufficiently explained whether or how Xin cures this deficiency in Medellin. *See* Final Act. 7; Ans. 11–12.

Accordingly, we do not sustain the Examiner’s rejection of independent claims 1, 11, and 19, and their dependent claims 2–6, 8–10, 12–15, 17, 18, and 20.

REJECTION UNDER 37 C.F.R. § 41.50(b)

Using our authority under 37 C.F.R. § 41.50(b), independent claims 1, 11, and 19 are rejected in a new ground of rejection under 35 U.S.C. § 101.

Section 101 defines patentable subject matter. However, the Supreme Court has “long held that this provision contains an important implicit exception” that “[l]aws of nature, natural phenomena, and abstract ideas are not patentable.” *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012) (quotation omitted). To determine patentable subject matter, the Supreme Court has set forth a two part test.

“First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts” of “laws of nature, natural phenomena, and abstract ideas.” *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014). For computer-related technologies, “the first step . . . asks whether the focus of the claims is on the specific asserted improvement in computer capabilities . . . or, instead, on a process that qualifies as an ‘abstract idea’ for which computers are invoked merely as a tool,” such as “adding conventional computer components to well-known business practices.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36, 1338 (Fed. Cir. 2016). “[T]he claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015).

Here, we find that independent claims 1, 11, and 19 are directed to the abstract idea of determining how to divide a three-dimensional object into smaller pieces to fit within a given three-dimensional volume. Spec. ¶ 1 (“this disclosure presents techniques to partition 3D objects into smaller components so that each component can be printed by a 3D printer having limited printing volume”), Abstract. We therefore proceed to the next step.

In the second step of the *Alice/Mayo* framework, we “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.” *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 78). The Supreme Court has “described step two of this analysis as a 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.* (quotation omitted). For computer-related technology, a claim may pass the second step if “the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer [technology].” *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014).

Here, we cannot say that either the problem or the solution is rooted in computers. For example, the same problem of how to divide a 3D object would be faced by a human chef deciding how to cut leftover brisket or ham to fit into smaller storage containers. Likewise, the solution to keep cutting until all pieces are small enough to fit applies equally to the human chef. Thus, whether in the kitchen or a 3D printer, how to divide a large object to fit into smaller volumes is not specific to computers.

Limiting the claims to 3D printing does not rescue them from § 101. As the Supreme Court has said, “limiting the use of an abstract idea to a particular technological environment” cannot transform a patent-ineligible abstract idea into a patent-eligible invention. *Alice*, 134 S. Ct. at 2358 (quotation omitted); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016).

Similarly, “the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *Alice*, 134

S. Ct. at 2358. Here, the claims do no more than recite generic computer components performing their ordinary function. For example, a memory (claim 19) or storage medium (claim 11) are merely used to store a program (i.e., what a memory normally does); the processor only is used for “determining, via one or more processors, a set of planar cuts,” but the claims provide no guidance or limitation on *how* the processor determines that set of cuts or why a human could not make that same determination; and the 3D printer is not used at all other than providing a “volume” that the resulting components need to fit within. Thus, “with 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).

To the contrary, in the Background section of the Specification, the “Description of the Related Art” expressly states, “One approach to printing objects that do not fit within a given printing volume is for a user to *manually* partition 3D models of those objects. The 3D printer then prints the components resulting from the *manual* partitioning.” Spec. ¶ 3 (emphasis added). Thus, the Specification recognizes that manual partitioning of 3D objects was known. That same paragraph goes on to explain that “manual partitioning is often a laborious process which does not guarantee that resulting components can be assembled, that the partitioned components can be printed, or that the components, once printed and/or assembled, will be structurally sound.” *Id.* However, no limitation in claims 1, 11, or 19 necessarily avoids the problems described for manual partitioning. For example, nothing in the claimed method recites a new

technique guaranteeing structurally sound components capable of being printed and assembled. “[T]he fact that the required calculations could be performed more efficiently via a computer does not materially alter the patent eligibility of the claimed subject matter.” *Bancorp Servs., L.L.C. v. Sun Life Assurance Co.*, 687 F.3d 1266, 1278 (Fed. Cir. 2012). Thus, aside from generic computer components, claims 1, 11, and 19 attempt to preempt and claim a process that the Specification recognizes can be done manually.

We therefore reject claims 1, 11, and 19 under 35 U.S.C. § 101 for being directed to unpatentable subject matter.

Although we have rejected some claims under 37 C.F.R. § 41.50(b), we have not reviewed the remaining claims to the extent necessary to determine whether those claims are unpatentable for similar reasons. We leave it to the Examiner to determine the appropriateness of any further rejections based thereon.

DECISION

For the reasons above, we reverse the Examiner’s decision rejecting claims 1–6, 8–15, and 17–20.

In a new ground of rejection, we reject independent claims 1, 11, and 19 under 35 U.S.C. § 101.

TIME TO RESPOND

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides that “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.” Section 41.50(b) also provides:

When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, 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 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 prosecution will be remanded to the examiner. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the examiner, overcomes the new ground of rejection designated in the decision. Should the examiner reject the claims, appellant may again appeal to the Board pursuant to this subpart.

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

REVERSED;
37 C.F.R. § 41.50(B)