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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KENJI MATSUE and KENICHI NIWA

Appeal 2016-005370
Application 12/626,765
Technology Center 3600

Before JOSEPH L. DIXON, ST. JOHN COURTENAY III, and
THU A. DANG, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1–3 and 8, which are all the claims pending in this application. Claims 4–7 and 9–12 are cancelled. We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We reverse.

STATEMENT OF THE CASE

Introduction

Appellants’ invention relates to “a medical image generation apparatus, a medical image storage apparatus, a medial image display apparatus, and a medial image display system.” (Spec. 1.) Specifically, the invention on appeal “allow[s] the medical image display apparatus to display

[a] medical image requested by an operator regardless of the performance of the medical image display apparatus by processing internal images of an object taken by the image generator.” (*Id.*)

Illustrative Claim

1. **A medical image display system**, comprising:
a medical image generation apparatus, including
a four-dimensional image data generation circuit generating four-dimensional image data composed of a plurality of three-dimensional image data blocks each having information indicating a number in chronological order of the three-dimensional image data blocks by using image information acquired by taking images of an object;
a memory storing the four-dimensional image data generated by the four-dimensional image data generation unit; and
an image generation circuit generating movie data composed of a plurality of two-dimensional image data blocks generated from the plurality of three-dimensional image data blocks constituting the four-dimensional image data stored in the **memory**, and generating relevant information associating each of the two-dimensional image data blocks constituting the movie data with one of the three-dimensional image data blocks which is a source of the blocks of two-dimensional image data; and
a medical image display apparatus connected to the **four-dimensional image data generation circuit**, the **memory**, and the **image generation circuit** through **a network**, and displaying the two-dimensional image data blocks and the three-dimensional image data blocks,
wherein when one of the two-dimensional image data blocks is identified in the movie data at the **medical**

image display apparatus, the three-dimensional image data block corresponding to the identified two-dimensional image data block is read based on the relevant information through the **network**, and the read three-dimensional image data block is displayed on the **medical image display apparatus**.

(Positively recited hardware components are emphasized in bold.)

Rejection

Claims 1–3 and 8 are rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter, i.e., a judicial exception (a law of nature, a natural phenomenon, or an abstract idea), without significantly more.

(Final Act. 2.)

Issues on Appeal

Did the Examiner err in rejecting claims 1–3 and 8 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter?

ANALYSIS

Rejection of Claims 1–3 and 8 under 35 U.S.C. § 101

Under 35 U.S.C. § 101, a patent may be obtained for “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” The Supreme Court has “long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014) (quoting *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013)). The Supreme Court in *Alice* reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1300 (2012), “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 that analysis is to determine whether the claims at issue are directed to one of those patent-ineligible concepts, such as an abstract idea. **Abstract ideas may include, but are not limited to, fundamental economic practices, methods of organizing human activities, an idea of itself, and mathematical formulas or relationships.** *Id.* at 2355–57. **If the claims are not directed to a patent-ineligible concept, the inquiry ends.**

Otherwise, the inquiry proceeds to the second step where the elements of the claims are considered “individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Id.* at 2355 (quoting *Mayo*, 132 S. Ct. at 1298, 1297). We, therefore, look to whether the claims focus on a specific means or method that improves the relevant technology or instead are directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016).

Step 1

Turning to the first part of the *Alice/Mayo* analysis, the Examiner concludes at least claim 1 “when read in light of the level of ordinary skill in the art, the broadest and most reasonable interpretation of this limitation would envelop a **generic/general-purpose computer** and/or hardware.” (Final Act. 2 (emphasis added).)

Premised upon this claim interpretation, the Examiner further concludes that claim 1 is directed to an abstract idea:

[Claim 1] does not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than: mere instructions to implement the idea on a computer, and/or recitation of generic computer structure that serves to perform generic computer functions that are well-understood, routine, and conventional activities previously known to the pertinent industry. Viewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amounts to significantly more than the abstract idea itself. Therefore, the claim(s) is/are rejected under 35 U.S.C. [§] 101 as being directed to non-statutory subject matter.

(Final Act. 2–3.)

Regarding the remaining claims, the Examiner concludes that claims 2 and 3 do not remedy the deficiencies of independent claim 1. The Examiner also rejects independent system/apparatus claim 8 under §101 for a “substantially similar rationale” as applied to claim 1. (*Id.*)

Regarding *Alice* Step 1, Appellants understand the basis for the rejection of apparatus claim 1, as follows:

The Advisory Action further asserts that “[t]he abstract idea as recited appears to be: transforming data from 3D to 4D to 2D, especially because the claim does not specifically recite **how** these transformations are accomplished.” Further, the Advisory Action states that [c]laim 1 includes “a mathematical procedure for converting one form of numerical representation to another.

(App. Br. 6 (footnotes omitted).)

However, Appellants urge that claim 1 is not directed to an abstract idea:

In particular, Applicants respectfully submit that “processing imaging data” is not a concept that has been identified by the courts as an abstract idea. For example, the Supreme Court has identified abstract ideas to be those related to fundamental economic practices, methods of organizing human activity, an idea itself, and mathematical relationships.

The Office Action has not identified, for example, a mathematical relationship recited in [c]laim 1, and Applicants respectfully submit that none of these types of abstract ideas is present in or recited in [c]laim 1. For example, while the Advisory Action concludes that a “mathematical procedure” is present in [c]laim 1, the Advisory Action does not point to any corresponding claim language. Further, regarding “transforming data from 3D to 4D to 2D,” the Office Action admits that how this is accomplished is not recited in [c]laim 1. That [c]laim 1 is broad does not mean it recites an abstract idea.

(App. Br. 6–7.)

In further support, Appellants argue:

Moreover, as admitted by the Examiner, [c]laim 1 involves transformation of data representing a physical object (“using image information acquired by taking images of an object”) and thus satisfies the transformation prong of the machine-or-transformation test, an indication that “significantly more” is recited in [c]laim 1.

(*Id.* at 10.)

At the outset, we note Appellants’ independent claim 1 is directed to “[a] **medical image display system**, comprising” at least the positively recited hardware components of “**a four-dimensional image data generation circuit . . . a memory . . . an image generation circuit . . . [and] a medical image display apparatus . . . [and] a network**” (emphasis added). Independent apparatus claim 8 recites equivalent hardware components, sans the memory component recited in claim 1. Thus, we

conclude claims 1 and 8 are each directed to a **machine**, which is one of the four statutory subject classes under 35 U.S.C. § 101.¹

We next consider the question of whether the claims (directed to a machine) are nevertheless directed to the patent-ineligible judicial exception of an abstract idea — for example, mere instructions to implement the idea on a computer.

We particularly note that no software or executable code is claimed (claims 1–3 and 8). Although claim 1 recites “a memory,” the recited “memory” merely stores **image data**, i.e., “the four-dimensional **image data** generated by the four-dimensional image data generation unit” (emphasis added). *The memory is not claimed as being used to store executable code.*

Contrary to the Examiner’s findings (Final Act. 3), we do not find a recitation of **generic computer structure** in claims 1–3 and 8 that serves to perform generic computer functions that are well-understood, routine, and conventional, as previously known in the pertinent industry. We particularly note that instead of finding such *routine, and conventional activities* in the prior art (for purposes of an art rejection under §§ 102 or 103), the Examiner indicates that claims 1–3 and 8 are allowable over the prior art of record.

¹ 35 U.S.C. § 101 (“Whoever 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” (emphasis added).).

(*Id.*).² As noted above, no software or executable code is claimed.³

We consider the claims as whole under a broad but reasonable interpretation consistent with the Specification.⁴ Based upon our review of the record, we conclude claims 1 and 8 are directed to **generating** image data using “a four-dimensional image data generation **circuit**” and an “image generation **circuit**” (that generates movie data), instead of merely **collecting** data (emphasis added). Thus, we conclude Appellants’ claims are distinguished from the type of claim considered the court in *Elec. Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (“we have treated **collecting information**, including when limited to particular content (which **does not change its character as information**), as within the realm of abstract ideas.” (Emphasis added)).

Nor are the claims before us on appeal directed to any aspect of **fundamental economic practices, a method of organizing human activity, an idea of itself, or financial data processing**. *Cf. Content*

² The Supreme Court guides: “[t]he ‘novelty’ of 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 § 101 categories of possibly patentable subject matter.” *Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981).

³ *Cf. with* Spec. 9 (¶ 2) (“The medical image generation apparatus 1 includes a **central processing unit (CPU)** 1a, a **read only** memory (ROM) 1b, a **random access** memory (RAM) 1c, and an I/O (I/O) interface 1d, which are connected to each other through a bus 1e.” (emphasis added). However, we note that none of these elements described in the Specification is claimed. Instead of ROM or RAM, a “memory storing the four-dimensional image data” is recited in claim 1.

⁴ We give the claim limitations the broadest reasonable interpretation consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (surveying previous opinions in concluding that “claims directed to the mere formation and manipulation of economic relations” through “financial transactions” **are abstract**); accord *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1340 (Fed. Cir. 2017) (the court concluding “the patent claims are, at their core, directed to the abstract idea of collecting, displaying, and manipulating data . . . the patent’s recitation of XML documents specifically, does little more than restrict the invention’s field of use. Such limitations do not render an otherwise abstract concept any less abstract.”).⁵

As argued by Appellants, “‘processing imaging data’ is not a concept that has been identified by the courts as an abstract idea.” (App. Br. 6.) Appellants urge that “while the Advisory Action concludes that a ‘mathematical procedure’ is present in [c]laim 1, the Advisory Action does not point to any corresponding claim language.” (*Id.* at 6–7.) Regarding any specific mathematical algorithm that transforms data from 3D to 4D to 2D, Appellants emphasize the “Office Action admits that how this is accomplished is not recited in [c]laim 1. That [c]laim 1 is broad does not mean it recites an abstract idea.” (*Id.*)

We agree with Appellants there is no mathematical algorithm expressly recited in any of claims 1–3 and 8. We note the **four-dimensional image data** that is generated by the **four-dimensional image data**

⁵ See also *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344–45 (Fed. Cir. 2013) (claims reciting “generalized software components arranged to implement an abstract concept [of generating insurance-policy-related tasks based on rules to be completed upon the occurrence of an event] on a computer” not patent eligible);

generation circuit is *defined in the claim* in terms of its content, i.e., as being “composed of a plurality of three-dimensional image data blocks each having . . . a number in chronological order of the three-dimensional image data blocks using image information acquired by taking images of an object” (claim 1).

We further note the **movie data** generated by the claimed **image generation circuit** is also *defined in the claim* in terms of its content, as being

composed of a plurality of two-dimensional image data blocks generated from the . . . three-dimensional image data blocks constituting the four-dimensional image data . . . and generating relevant information associating each of the two-dimensional image data blocks . . . with one of the three-dimensional image data blocks which is a source of the . . . two-dimensional image data
(claim 1).

Moreover, we do not conclude that the claims on appeal cover any and all algorithms for performing the recited functions.⁶ Instead, we conclude the scope of the claims is limited to corresponding equivalent **circuit structures** that are capable of performing the recited functions.⁷

Therefore, on this record, we conclude the aforementioned guiding case law from our reviewing courts more strongly supports Appellants’ contention that the claims before us on appeal are not directed to an abstract

⁶ The Supreme Court stated in *Gottschalk v. Benson*, 409 U.S. 63, 72 (1972) that such “patent would wholly preempt the mathematical formula and in practical effect would be a patent on the algorithm itself.”

⁷ See the corresponding support in the Specification (11) for the recited “four-dimensional image data generation circuit” and the recited “image generation circuit.” (Claims 1 and 8.)

idea. (App. Br. 7). Thus, our inquiry ends, and we need not reach *Alice* step two.

Nevertheless, for the sake of a complete analysis, and in the alternative, if *arguendo* step one of *Alice* was not satisfied, we proceed to step two of *Alice*.

Step 2

We analyze the claims to determine if there are additional limitations that individually, or as an ordered combination, ensure the claims amount to “significantly more” than the abstract idea. *Alice*, 134 S. Ct. at 2357.

The “machine-or-transformation” (MoT) test

As recognized by the Federal Circuit in *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715–16 (Fed. Cir. 2014), the “machine-or-transformation” (MoT) test, as outlined in *In re Bilski*, 545 F.3d 943, 954 (Fed. Cir. 2008), can provide a “useful clue” in the second step of the *Alice* framework. Under *Bilski*’s MoT test, a claimed process is patent-eligible under § 101 if:

- (1) it is tied to a **particular** machine or apparatus; or
- (2) the process transforms a **particular article** into a **different state or thing**. *Bilski*, 545 F.3d at 954 (citing *Gottschalk*, 409 U.S. at 70).

Here, we conclude Appellants’ claims 1–3 and 8 are tied to a **particular machine** or apparatus, because dedicated image generation **circuit structures** are expressly claimed: “**a four-dimensional image data generation circuit . . . [and] an image generation circuit**” (emphasis added). We again emphasize that claims 1–3 and 8 are silent regarding any

specific mention of a “computer” or “CPU” (Central Processing Unit), generic or otherwise.⁸

Further, as persuasively argued by Appellants:

as admitted by the Examiner, [c]laim 1 involves **transformation of data representing a physical object** (“using image information acquired by taking images of an object”) and thus satisfies the transformation prong of the machine-or-transformation test, an indication that “significantly more” is recited in [c]laim 1.

(App. Br. 10 (emphasis added).)

Prong two of the MoT test is directed to the transformation of a **particular (physical) article** into a **different state or thing**. An example of such physical transformation would be the result of a chemical reaction, such as adding carbon to iron to produce steel.

However, previous cases have addressed **data transformation** in which the **data is representative of physical and tangible objects**, such as **bones, organs and body tissues**. *See, e.g., In re Abele*, 684 F.2d 902 (CCPA 1982) (where the court held a process for graphically displaying X-ray data as patent-eligible because X-ray data was representative of physical and tangible objects such as bones, organs and body tissues); *see also Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992) (where the Federal Circuit concluded that claims directed to an apparatus and process of analyzing electrocardiographic signals were patent-

⁸ *Cf. Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333–34 (Fed. Cir. 2012) (“[s]imply adding a ‘computer aided’ limitation to a claim covering an abstract concept, without more, is insufficient to render [a] claim patent eligible” (internal citation omitted)).

eligible because these electrical signals **represented physical heart activity** that was being monitored in a patient).

Therefore, in applying the MoT test as a “useful clue” in the second step of the *Alice* framework, we conclude that **prong 1** of the MoT test (“tied to a particular machine”) **is satisfied** by the **dedicated claimed circuits** recited in Appellants’ claims 1–3 and 8.

Further, and in light of at least the *Abele* and *Arrhythmia Research* cases cited above (involving **data transformation** in which **the data represents a physical object**), we additionally find that prong two of the MoT test is *likely* satisfied. We emphasize that only one prong needs to be met to satisfy the MoT test, because of the alternative “or” language between prong one and prong two.

Therefore, for at least the aforementioned reasons, we conclude Appellants’ claims on appeal also recite a series of limitations that, when considered individually and as an ordered combination, provide an inventive concept sufficient to confer patent eligibility.

DECISION

The decision of the Examiner rejecting claims 1–3 and 8 is reversed.

REVERSED