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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDRE NOVOMIR HLADIO, ARMEN GARO BAKIRTZIAN, and URIAH LODEWYK ANTOINE VAN AMEROM

Appeal 2018-003051
Application 14/071,185
Technology Center 3700

Before DANIEL S. SONG, MICHELLE R. OSINSKI, and WILLIAM A. CAPP, *Administrative Patent Judges*.

CAPP, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134(a) of the final rejection of claims 1–13 and 15–26 under 35 U.S.C. § 101 as directed to a judicial exception to patent eligible subject matter. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

THE INVENTION

Appellants' invention relates to aligning a prosthesis during surgery. Spec. ¶ 2. Claim 1, reproduced below, is illustrative of the subject matter on appeal.

> 1. A system for determining an orientation of a surgical tool with respect to a bone of a patient, the system comprising:
>
> a first active sensor configured to sense a movement of the first active sensor and transmit first information relating to the movement of the first active sensor, the first active sensor configured to be attached on the bone at a fixed sensor position preoperatively identified for use during an operation and having a predetermined relationship with respect to a reference plane for the bone defined by three or more reference locations on the bone identified preoperatively and wherein changes in orientation to the reference plane are trackable through changes in orientation of the first active sensor;
>
> a second active sensor configured to sense a movement of the second active sensor and transmit second information relating to the movement of the second active sensor, the second active sensor configured to attach to the surgical tool; and
>
> a processor in communication with the first and second sensors, the processor configured to:
>
> receive data representing distances between the three or more reference locations with which to define the reference plane for the bone, the distances determined preoperatively;
>
> define the reference plane in accordance with the distances between the three or more reference locations;
>
> compute the relationship between the first active sensor located at the preoperatively identified fixed sensor position and the reference plane;
>
> receive the first information and second information; and
>
> determine a three-dimensional orientation of the surgical tool with respect to the reference plane based on the first and second information and the relationship.

OPINION

Patent Eligibility under 35 U.S.C. § 101

The controlling statute provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. The Courts recognize certain judicial exceptions to Section 101, namely: (1) laws of nature, (2) natural phenomena, and (3) abstract ideas. *See Mayo Collaborative Svc. v. Prometheus Labs, Inc.*, 566 U.S. 66, 70–71 (2012).

The Supreme Court has set forth "a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 217 (2014) (citing *Mayo*, 566 U.S. at 72–73). According to the Supreme Court's framework, we must first determine whether the claims at issue are directed to one of those concepts. *Id.* If so, we must secondly "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." *Id.*

The PTO recently published revised guidance on the application of Section 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("*2019 Guidelines*"). Under such guidelines, in conducting step one of the *Alice* framework, we first look to whether the claim recites:

(*Prong 1*) any judicial exceptions, including certain groupings of abstract ideas; and

(*Prong 2*) additional elements that integrate the judicial exception into a practical application.

In other words, under prong 1 of an abstract idea analysis, we look to whether the claim recites an abstract idea. Then, if it does, under prong 2, we look at the claim, as a whole, and determine whether the claim is "directed to" the abstract idea or, instead, is "directed to" a "practical application" of the abstract idea.

Section 101 Analysis of Claims 1–12 and 25

Step 1, Prong 1

The *2019 Guidelines* identify three key concepts as abstract ideas: (a) mathematical concepts including "mathematical relationships, mathematical formulas or equations, mathematical calculations"; (b) certain methods of organizing human activity, such as "fundamental economic principles or practices," "commercial or legal interactions," and "managing personal behavior or relationships or interactions between people"; and (c) mental processes including "observation, evaluation, judgment, [and] opinion."

With respect to the first step, the Examiner determines that the claims are directed to an abstract idea. Final Action 2. According to the Examiner, the steps are directed to an abstract idea in the form of receiving and processing data (*which, under appropriate circumstances, can be considered a "mental process" under the 2019 Guidelines*). *Id.*

Collecting and analyzing information, without more, are treated as essentially mental processes within the abstract idea category. *FairWarning IP, LLC v. Iatric Systems, Inc.*, 839 F.3d 1089, 1093 (Fed. Cir. 2016) citing *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016).

> Methods which can be performed entirely in the human mind are unpatentable not because there is anything wrong with claiming mental method steps as part of a process containing non-mental steps, but rather because computational methods which can be performed entirely in the human mind are the types of methods that embody the "basic tools of scientific and technological work" that are free to all men and reserved exclusively to none.

Cybersource Corp. v. Retail Decisions, Inc., 654 F.3d 1366 1373 (Fed. Cir. 2011). *See also Synopsys, Inc. v. Mentor Graphics Corp.,* 839 F.3d 1138, 1147 (Fed. Cir. 2016)) (explaining that analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, are essentially mental processes within the abstract-idea category).

Claim 1 recites:

- a first sensor;
- a second sensor; and
- a processor that is configured to:

  receive data;

  define a reference plane . . .;

  compute a relationship . . . ; and

  determine an orientation.

Claims App. The first sensor senses movement of a bone within a frame of reference. *Id.* The second sensor senses movement of a surgical tool within the frame of reference. *Id.* The processor then takes position and movement information of the bone sensor and the tool sensor within the frame of reference and performs what amounts to navigational computations to ascertain the position and orientation of the bone relative to the surgical tool. Thus, the claim recites sensors that collect information and then recites

a processor that analyzes the information using mathematical algorithms to orient two objects in three-dimensional space.

Orienting objects in three-dimension space is something that humans do on a routine basis. At a high level abstraction, the claimed subject matter is not fundamentally different than an automotive mechanic assembling a carburetor from a plurality of individual components. A human visualizes two objects using eyes (and/or touch) as sensors and then, after collecting information related to the location and orientation of the two objects, engages in mental processes to ascertain how a first object is oriented in space vis-à-vis a second object and how the objects must be repositioned from a first relative position to a second relative position so that they are located and oriented in the desired arrangement for assembly. Although Appellants' sensors and processor may perform the bone/tool orientation task at a higher degree of speed and/or precision than an automotive mechanic can manually assemble a carburetor, the two tasks are fundamentally similar.[1]

The case of *Thales Visionix Inc. v. United States*, 850 F.3d 1343 (Fed. Cir. 2017) is instructive here. *Thales* involved an inertial tracking system for tracking the motion of an object relative to a moving reference frame. *Id.* at 1344. The system in *Thales* used inertial sensors, such, as accelerometers and gyroscopes, to measure forces associated with changes in a sensor's position and orientation relative to a known starting position. *Id.* Although the *Thales* Court ultimately determined that the claims were

[1] Merely taking advantage of the improved speed or efficiency inherent with applying an abstract idea on a computer is not sufficient to establish patentable subject matter under Section 101. *See Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016).

not "directed to" an abstract idea in accordance with an analysis that parallels our step one, prong two analysis below, *Thales* reconfirmed the underlying principle that collecting and analyzing electronic information using mental processes that could be performed by humans recites an abstract idea. *Id.* at 1346–47.

In view of the foregoing discussion, we determine that the claim falls within the ambit of essentially a mental process under our guidelines and thus recites an abstract idea.

Step 1, Prong 2

Under Prong 2 of Step 1 of the *2019 Guidelines*, we do not assume that such claims are directed to patent ineligible subject matter because "[a]t some level, 'all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.'" *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016) quoting *Alice* (quoting *Mayo*). Instead, "the claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter." *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016). If the claims are not directed to an abstract idea, the inquiry ends. *2019 Guidelines*. If the claims are "directed to" an abstract idea, then the inquiry proceeds to the second step of the *Alice* framework. *Id.*

Consequently, we consider whether the claimed system for determining orientation of a surgical tool includes additional elements that integrate the judicial exception into a practical application. A claim that integrates a judicial exception into a practical application will apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on

the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception. 2019 *Guidelines*.

Appellants argue that claim 1 is not directed to an abstract idea. Appeal Br. 11.

> [T]he subject matter relates to navigational assisted surgery, which may assist a surgeon or a robot to perform a surgical procedure. In some examples the procedure is a Total Hip Arthroplasty. The system and method provide assistance during the surgical procedure tracking and determining (relative) positions of a patient bone and a surgical tool (both being physical real world tangible items) with the intent of improving performance and outcomes (Spec. paras. 6 and 58).
>
> As such the system and method are not directed to abstract ideas but are a sophisticated real-time measuring system and method.

Id.

In response, the Examiner reiterates that the claim entails collecting and analyzing data. Ans. 2.

The Federal Circuit cautions us not to "overly abstract" claims when performing the *Mayo/Alice* analysis. *Natural Alternatives Intl., Inc. v. Creative Compounds, LLC,* 918 F.3d 1338, 1350 (Fed. Cir. 2019). Although Appellants' claim 1 does collect and analyze data, it would be an over-simplification of the claim to state that it is "directed to" an abstract idea. Here, the first sensor is configured to be attached to a bone. Claims App. The second sensor is configured to be attached to a surgical tool. *Id.* The sensors are used to define a spatial relationship and orientation between the bone and the tool to enhance a surgical procedure. We view this as a technological improvement in the delivery of a medical service and, as such, the claims are directed to a specific tangible application. *See Classen*

Immunotherapies, Inc. v. Biogen IDEC, 659 F.3d 1057, 1066–67 (Fed. Cir. 2011) (explaining that claims directed to a specific, tangible application of an abstract idea recited patent eligible subject matter).

As previously discussed, the system in the *Thales* case used inertial sensors, such, as accelerometer and gyroscopes, to measure forces associated with changes in a sensor's position and orientation relative to a known starting position. *Thales,* 850 F.3d at 1345. However, the inertial sensors of *Thales* were used to directly measure the gravitational field of a moving platform frame rather than using the conventional approach of measuring inertial changes with respect to the earth. *Id.* The *Thales* court determined that the claims were not merely directed to an abstract idea, but instead were directed to systems that used inertial sensors in a non-conventional manner to reduce errors in measuring the relative position and orientation of a moving object on a moving reference frame. *Id.* at 1348–49.

> We hold that the '159 patent claims at issue in this appeal are not directed to an abstract idea. The claims specify a particular configuration of inertial sensors and a particular method of using the raw data from the sensors in order to more accurately calculate the position and orientation of an object on a moving platform. The mathematical equations are a consequence of the arrangement of the sensors and the unconventional choice of reference frame in order to calculate position and orientation. Far from claiming the equations themselves, the claims seek to protect only the application of physics to the unconventional configuration of sensors as disclosed. As such, these claims are not directed to an abstract idea and thus the claims survive *Alice* step one.

Id. at 1349.

Similarly, claim 1 of the instant application integrates the judicial exception into a practical application and, therefore, is not "directed to" an

abstract idea. *2019 Guidelines*. This ends our inquiry in Appellants' favor such that we do not sustain the Examiner's rejection of claim 1 based on judicial exception to Section 101. *See McRO*, 837 F.3d at 1312 (explaining that if the claims are not "directed to" an abstract idea, the inquiry ends). For essentially the same reason, we also do not sustain the Examiner's rejection of claims 2–12 and 25 which depend, directly or indirectly, from claim 1.

Claims 13, 15–24 and 26

Claim 13 is an independent claim that is substantially similar in scope to claim 1 except that it recites a method instead of a system/apparatus. Claims App. The Examiner rejects claim 13 under essentially identical findings and rationale as the Examiner previously applied to the rejection of claim 1. Final Action 3–4. Appellants, in turn, traverse the rejection using essentially the same arguments that were asserted against the rejection of claim 1. *See generally* Appeal Br.

As with claim 1, we determine that, although claim 13 recites an abstract idea, the claim, as a whole, is directed to a practical application and, therefore, recites patent eligible subject matter. Consequently, we do not sustain the Examiner's Section 101 rejection of claim 13, nor do we sustain the rejection of claims 15–24 and 26 that depend therefrom.

DECISION

The decision of the Examiner to reject claims 1–13 and 15–26 as being directed to unpatentable subject matter under 35 U.S.C. § 101 is reversed.

REVERSED