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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/497,218	03/20/2012	Lionel Rosellini	4005/0379PUS2	2082
60601	7590	09/04/2018	EXAMINER	
Muncy, Geissler, Olds & Lowe, P.C. 4000 Legato Road Suite 310 Fairfax, VA 22033 UNITED STATES OF AMERICA			PETERS, LISA E	
			ART UNIT	PAPER NUMBER
			2862	
			MAIL DATE	DELIVERY MODE
			09/04/2018	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LIONEL ROSELLINI and YANNICK FOLOPPE

Appeal 2018-000587
Application 13/497,218¹
Technology Center 2800

Before KAREN M. HASTINGS, JAMES C. HOUSEL, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the
Examiner's decision rejecting claims 1–13.

We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellants identify the real party in interest as SAGEM DEFENSE
SECURITE. (Appeal Br. 2).

Independent claim 1 below is illustrative of the subject matter on appeal:

1. A method, comprising:
 - aligning an inertial unit that comprises a processor unit having a navigation module connected to accelerometer and angle sensors placed in a predetermined frame of reference; and
 - detecting, using the processor unit, parasitic movements of the inertial unit, said detecting comprising:
 - integrating signals from the accelerometer and angle sensors, in a frame of reference that is turning in an orientation that can be detected by the accelerometer and angle sensors, in order to obtain a raw position signal during a predetermined duration;
 - recording the raw position signal during said predetermined duration;
 - determining parameters of a theoretical signal modeling the raw position signal as a function of a predetermined error model in the absence of movement so that the theoretical signal, along each axis as a function of time, is modeled by a polynomial function;
 - calculating a residual signal between the theoretical modeling signal and the raw position signal; and
 - identifying a parasitic movement when the residual signal overshoots a predetermined limit threshold.

The Examiner maintains the following rejections²:

- (a) claims 1–13 under 35 U.S.C. § 101 as being directed to non-statutory subject matter;

² We refer to the Specification, filed Mar. 20, 2012 (“Spec.”); the Non-final Office Action mailed Dec. 14, 2016 (“Non-final Act.”), Appeal Brief, filed July 6, 2017 (“Appeal Br.”); the Examiner’s Answer, mailed Aug. 24, 2017 (“Ans.”), and the Reply Brief filed Oct. 24, 2017 (“Reply Br.”).

(b) claims 1–3, 8, and 11–13 under 35 U.S.C. § 103(a) as being unpatentable over Lin (US 2006/0287824 A1, published Dec. 21, 2006) (“Lin”) in view of Williamson et al. (US 2006/0074558 A1, published Apr. 6, 2006) (“Williamson”) and Takaoka (US 2011/0066376 A1, published Mar. 17, 2011) (“Takaoka”);

(c) claims 4–7 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Lin, Williamson, and Takaoka and further in view of Tessier (US 2011/0040430 A1, published Feb. 17, 2011) (“Tessier”); and

(d) claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Lin, Williamson, Takaoka, and Tessier and further in view of Petillon et al. (US 8,543,281 B2, issued Sept. 24, 2013) (“Petillon”).

ANALYSIS

§ 101 Rejection

Claims 1–13 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. We address claims separately from representative claim 1 only to the extent that they have been argued separately pursuant to 37 C.F.R. § 41.37(c)(1)(iv).

The first step in analyzing whether a claim is directed to patent-eligible subject matter is determining whether the claim is directed to one of the patent-ineligible concepts: laws of nature, natural phenomena, and abstract ideas (*Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014) (citing *Mayo Collaborative Services v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012))). If a claim is directed to a patent-ineligible concept, the second step in the analysis is to determine whether additional elements of the claim, “both individually and ‘as an ordered combination,’” “transform

the nature of the claim’ into a patent-eligible application” (*Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79, 78)). Thus, 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.* at 2357 (quoting *Mayo*, 566 U.S. at 78)).

Here, the Examiner finds claim 1 is directed to abstract ideas that amount to no more than diagnosing an abnormal condition by performing tests and analyzing the results, similar to the claims of *In re Grams*, 888 F.2d 835 (Fed. Cir. 1989); organizing information through mathematical correlations, similar to the claims of *Digitech Image Tech., LLC. V. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014), and implementing a principle, algorithm, or mathematical formula, as in *Parker v. Flook*, 437 U.S. 584 (1978) (Non-final Act. 7). The Examiner finds the additional elements of claim 1 do not amount to significantly more because they are extra-solution activity to carry out the abstract idea that do not appear to improve the functioning of a computer or other technology or confine the judicial exception to a particular application (*id.* at 7–8). The Examiner makes similar findings for claims 2–13 (*id.* at 8–10).

Appellants assert the claimed invention is not merely the recitation of instructions to apply the abstract idea on the internet or on a generic computer but recites a “technology-based solution” of “aligning an inertial unit” and thus involves a real world physical component (i.e., the inertial unit, processor, navigation module, accelerometer, and sensors) and monitoring and adjusting its movement and position (Appeal Br. 6; Reply Br. 1).

Appellants' arguments are unpersuasive. The Federal Circuit indicated in *In re Grams* that the presence of a physical step in a claim alone is not sufficient to make the subject matter of a claim statutory when the claim otherwise focuses on a mathematical algorithm (888 F.2d at 840). Thus, the recitation of steps involving an inertial unit and its processor unit are, by themselves, insufficient to render the claimed subject matter eligible for patent protection. As noted above, we analyze a claim under the two step *Alice* test of whether the claim is directed to an abstract idea and whether additional elements of the claim transform the nature of the claim into a patent-eligible application.

We agree with the Examiner that claim 1 is directed to the abstract ideas of organizing information through mathematical correlations and implementing an algorithm or mathematical formula. The method of claim 1 comprises, among other things, detecting parasitic movements of an inertial unit by integrating signals from an accelerometer and angle sensors in a frame of reference that is turning to obtain a raw position signal that is recorded, determining parameters of a theoretical signal that models the raw position signal as a function of an error model in the absence of movement so the theoretical signal is modeled by a polynomial function, calculating a residual signal between the theoretical modeling signal and the raw position signal, and identifying a parasitic movement when the residual signal overshoots a predetermined limit threshold. These steps are directed to mathematical algorithms and operations, as explained in the Specification (Spec 6:6–7:33).

We next analyze whether the additional elements of claim 1, both individually and as an ordered combination, transform the nature of the

claim into a patent-eligible application under step two of *Alice*. As explained by the Federal Circuit in *In re Grams*, although the mere recital of an algorithm does not automatically render a claim nonstatutory, “the inclusion of a mathematical algorithm in a claim can render it nonstatutory if the claim in essence covers only the algorithm” (888 F.2d at 837). In *Digitech*, the Federal Circuit summarized the latter issue in the following way:

As noted by the Supreme Court, “an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.” *Diamond v. Diehr*, 450 U.S. 175, 187, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981). A claim may be eligible if it includes additional inventive features such that the claim scope does not solely capture the abstract idea. *Alice Corp.*, 573 U.S. —, 134 S.Ct. 2347. But a claim reciting an abstract idea does not become eligible “merely by adding the words ‘apply it.’” *Bancorp Servs., LLC v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1276 (Fed.Cir.2012).

758 F.3d at 1350. The Federal Circuit further stated:

Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible. “If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.” *Parker v. Flook*, 437 U.S. 584, 595, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) (internal quotations omitted).

Id. at 1351.

Here, the steps recited in claim 1 employ mathematical algorithms or operations (e.g., integration of signals from an accelerometer and angle sensors, determining parameters of a theoretical signal that is modeled by a

polynomial function, calculating the residual signal, and identifying a parasitic movement when the residual signal overshoots a limit threshold) but recite these steps with a high level of generality that, when considered individually and as an ordered combination, do not provide additional limitations beyond the abstract idea sufficient to transform the subject matter into a patent-eligible application. Although Appellants assert the method of claim 1 provides an improvement or advantage for a specific purpose, it appears that claim 1 would essentially capture the abstract idea it is directed to, which the Supreme Court and Federal Circuit have cautioned against.

Appellants argue in *Visual Memory LLC, v. NVIDIA Corp.*, 867 F.3d 1253 (Fed. Cir. 2017) the Federal Circuit relied heavily upon what is conveyed in the specification when determining whether a claimed invention was directed to patent eligible subject matter and the advantages described in Appellants' Specification explain a problem with conventional techniques and Appellants' invention addresses the problem (Reply Br. 1–2).

This argument is also unpersuasive. As discussed above, Appellants' Specification indicates the mathematical nature of their invention and the limitations of claim 1 are directed to mathematical algorithms without additional limitations, so claim 1 is not directed to capturing the use of those algorithms. Further, the claims of *Visual Memory* were found to be a technological improvement that enhanced a computer memory system, similar to *Enfish* and *Thales*, not a process focused on an abstract idea that uses a computer as a tool (867 F.3d 1258–1260). For instance, the Federal Circuit stated in *SAP America, Inc. v. Investpic. LLC*, 890 F.3d 1016, 1022 (Fed. Cir. 2018) that *Enfish*, *BASCOM*, and *Visual Memory* were cases involving improvements in the functioning of computer technology, not an

improved mathematical analysis. Although Appellants argue a technological improvement for the claimed invention, the claims appear to be directed to the latter; an improved mathematical analysis embodied in a process that focuses on the abstract idea and uses generic structures as tools to implement the abstract idea.

Appellants' comparisons of the claims to those in *BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016) (Appeal Br. 6–7) and *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343 (Fed. Cir. 2017) (Reply Br. 2) are also unpersuasive. The claims of *BASCOM* were directed to an unconventional installation of a filtering tool for internet content at a specific location with a customizable filtering feature specific to each end user that resulted in “a specific, discrete implementation of the abstract idea of filtering content” (827 F.3d at 1349–1350). The claims of *Thales* were directed to an unconventional arrangement of inertial sensors and calculations based on a different reference frame to reduce errors (850 F.3d at 1348–1349). Appellants do not explain that although their invention regards conventional or generic steps or components (e.g., when considered individually), they are combined in an unconventional manner that provides an improvement and thus patent-eligible subject matter under step two of *Alice*. See *Amdocs (Israel) Limited v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300 (Fed. Cir. 2016) (citing *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256–59 (Fed. Cir. 2014) and *BASCOM*, 827 F.3d at 1349–52). Nor do Appellants explain how the method of claim 1 is a specific, discrete implementation of an abstract idea that does not preempt all ways of detecting parasitic movements while aligning an inertial unit.

In view of the above, Appellants' arguments do not identify a reversible error in the Examiner's § 101 rejection of claim 1.

Appellants argue independent claim 11 is directed to a device including several structural components that the Examiner's rejection fails to properly address (Appeal Br. 6).

These arguments are also unpersuasive. The Examiner finds the accelerometer, angle sensors, and processor unit comprising a navigation module are "well understood, routine and conventional in the art" (Non-final Act. 8). Appellants assert the combination of claim limitations is not well-known, routine, or conventional (Appeal Br. 6). However, Appellants' Specification (Spec. 1:10–19) indicates accelerometers, gyroscopes (i.e., angle sensors), and processor units having a navigation module were known in the art. Nor is there is an indication that the overall system of claim 11 is an unconventional combination, as discussed above.

Therefore, Appellants' arguments also do not identify a reversible error in the Examiner's § 101 rejection of claim 11.

For these reasons and those set forth in the Examiner's Answer, we sustain the Examiner's § 101 rejection of claims 1–13.

§ 103 Rejection over Lin, Williamson, and Takaoka

Claims 1–3, 8, and 11–13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin, Williamson, and Takaoka. We address claims separately from representative claim 1 only to the extent that they have been argued separately pursuant to 37 C.F.R. § 41.37(c)(1)(iv).

Appellants' principle argument on appeal is that Takaoka is non-analogous art (Appeal Br. 7–8; Reply Br. 2). Specifically, Appellants

contend that Takaoka is not in the same field because Takaoka is directed to calculating velocity of a moving body on a travel surface, not detecting parasitic movements while aligning an inertial unit (Appeal Br. 8).

Appellants assert Takaoka is not pertinent to the inventors' problem of aligning an inertial unit when it is stationary so disturbances are avoided because Takaoka determines the velocity of a moving vehicle when GPS services are not available (*id.*).

The Examiner findings that Takaoka and the claimed invention both regard navigational systems and movement calculations associated with corrections to the systems (Ans. 4). In other words, Takaoka is in the same field of endeavor. Appellants argue that the Examiner's findings rely on broad generalizations (Reply Br. 2), but the Examiner's findings are supported by the applied references. Takaoka is directed to a velocity calculating device and a navigation device suitable for a portable navigation device (Takaoka ¶ 2). The Examiner finds velocity is movement (i.e., position) that can be mapped over time (Non-final Act. 13). Appellants do not dispute this finding. Thus, like an inertial unit, Takaoka's system provides position information. Moreover, Takaoka would have been reasonably pertinent to Appellants' problem of aligning a stationary inertial unit to avoid disturbances by demonstrating a method of modeling position signals (i.e., via polynomial functions).

Appellants further assert the Examiner has not provided some articulated reasoning with some rational underpinning to explain why one of ordinary skill in the art would have modified Lin, as modified in view of Williamson, further in view of Takaoka (Appeal Br. 8). The Examiner concludes it would have been obvious to modify Lin, as modified in view of

Williamson, further in view of Takaoka “for the expected benefit of adhering to well understood, routine and conventional scientific standards” (Non-final Act. 13). The Examiner further explains in the Examiner’s Answer that “Takaoka is merely relied upon to teach that the use of polynomial functions in motion models is known in the art” and demonstrates that “the use of polynomial functions in movement models is well within the understanding of one of ordinary skill in the art” (Ans. 4). Thus, the Examiner’s obviousness rationale relies on the well-established principle that, for an improvement to be patentable, it must be more than the predictable use of prior art elements according to their established functions. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Takaoka discloses the correction of velocity using a velocity model to reduce error and that a polynomial function can be used for this purpose (Takaoka ¶¶ 372, 376). Appellants contend that Takaoka only explains that a velocity model can reduce error included in a velocity (Reply Br. 3). However, as discussed above, the Examiner finds velocity is movement (i.e., position) that can be mapped over time (Non-final Act. 13), which Appellants do not dispute. Moreover, although Lin does not disclose the use of polynomial functions, Lin discloses the use of models to reduce position error (Lin ¶¶ 123, 212). Therefore, Appellants’ arguments are unpersuasive.

In addition, Appellants argue Takaoka does not remedy the deficiencies of Lin and Williamson because Takaoka “does not teach or suggest modelling a theoretical signal, with respect to parasitic movements of an inertial unit, by a polynomial function” (Appeal Br. 8–9). The Examiner responds by explaining that Lin and Williamson were cited for their disclosures modelling a theoretical signal with respect to parasitic

movements of an inertial unit while Takaoka demonstrates that the use of polynomial functions in motion models was known in the art (Ans. 4). Appellants respond by reiterating Takaoka “does not teach or suggest modelling a theoretical signal, with respect to parasitic movements of an inertial unit, by a polynomial function” (Reply Br. 3). This argument does not address the Examiner’s rejection. The test for obviousness is not that the claimed invention be expressly suggested in any one or all of the references but what the combined teachings of the references would have suggested to one of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Here, the Examiner has explained that the combination of Lin, Williamson, and Takaoka would have suggested the asserted limitations, not the disclosure of Lin alone. Therefore, Appellants’ arguments do not identify a reversible error in the rejection of claim 1.

Appellants do not argue claims 2, 3, 8, and 11–13 separately from claim 1 (Appeal Br. 7–9).

For the reasons discussed above and those set forth in the Examiner’s Answer, we sustain the Examiner’s § 103(a) rejection of claims 1–3, 8, and 11–13.

§ 103 Rejection of Claims 4–7, 9, and 10

Claims 4–7 and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin, Williamson, Takaoka, and Tessier.

Claim 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin, Williamson, Takaoka, Tessier, and Petillon.

Appellants assert claims 4–7, 9, and 10 are allowable for the reasons they have asserted with respect to claim 1 (*id.* at 9). As discussed above,

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Appellants' arguments do not identify a reversible error in the rejection of claim 1. Therefore, we sustain the § 103(a) rejections of claims 4–7, 9, and 10.

DECISION

The Examiner's rejection of claims 1–13 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).

AFFIRMED