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CANTOR COLBURN LLP
20 Church Street
22nd Floor
Hartford, CT 06103

EXAMINER
ELLIS, SUEZU Y

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte HIROSHI NAKAMURA

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Appeal 2018-007602
Application 14/226,137
Technology Center 2800

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Before N. WHITNEY WILSON, BRIAN D. RANGE, and
JENNIFER R. GUPTA, *Administrative Patent Judges.*

GUPTA, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[2] appeals from the

Examiner's decision to reject claims 3, 5, 8, 10. We have jurisdiction under

35 U.S.C. § 6(b). We REVERSE.

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[1] In this Decision, we refer to the Specification filed March 26, 2014
("Spec."), the Final Office Action dated June 20, 2017 ("Final Act."), the
Appeal Brief filed March 26, 2018 ("Appeal Br."), the Examiner's Answer
dated May 16, 2018 ("Ans."), and the Reply Brief filed July 16, 2018
("Reply Br.").
[2] We use the word Appellant to refer to "applicant" as defined in
37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Nidec
Sankyo Corporation. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The invention relates to a symbol information reader that optically reads symbol information, such as barcode symbols, and a method for reading symbol information. Spec. 1 ¶ 1. Independent claims 8 and 10, reproduced below from the Claims Appendix of the Appeal Brief, are illustrative of the claimed subject matter.

8.   A method for detecting a physical position of symbol information on a medium and decoding the symbol information, the method comprising:

optically capturing, with an imaging device, an image of the medium on which symbol information is recorded and converting the image into image data;

storing said image data in a storage unit;

retrieving said image data and detecting the physical position of said symbol information recorded on said medium; and

decoding the symbol information located at the detected physical position;

wherein said detecting the physical position of said symbol information comprises:

calculating brightness changes of said image data along a plurality of parallel scanning lines extending in a scanning direction of said image data, and identifying a temporary area having a possibility of corresponding to said symbol information when the brightness changes exceed a predetermined brightness change threshold,

calculating correlations of said temporary area with a first neighboring area neighboring the temporary area in a first direction perpendicular to the scanning direction and a second neighboring area neighboring the temporary area in a second direction perpendicular to the scanning direction and opposite to the first direction and creating a correlation map indicating the correlation of

the temporary area to the first neighboring area and the second neighboring area,

searching said correlation map for a presence of a predetermined basic barcode pattern and labeling an area judged as having said predetermined basic barcode pattern, and

detecting the position of said symbol information recorded on said medium based on said labeled area,

wherein, in the correlation map, a high correlation area is an area in which the correlation of the temporary area with the first neighboring area and the second neighboring area exceeds a predetermined correlation threshold; and

wherein said labeling the area comprises judging that the temporary area includes the predetermined basic barcode pattern when a ratio of high correlation areas to a total area of temporary area exceeds a predetermined ratio threshold or based on a position of said high correlation areas;

wherein the temporary area includes the predetermined basic barcode even if a sum of element values of all elements in said basic pattern is smaller than the sum of the element values obtained when all elements are of high correlation as long as the sum of element values of all elements in said basic pattern is equal to or larger than a predetermined value.

Appeal Br. 25–27 (Claims App.).

10.   A method for detecting a physical position of symbol information on a medium and decoding the symbol information, the method comprising:

optically capturing, with an imaging device, an image of the medium on which symbol information is recorded and converting the image into image data;

storing said image data in a storage unit;

retrieving said image data and detecting the physical position of said symbol information recorded on said medium; and

decoding the symbol information located at the detected physical position;

wherein said detecting the physical position of said symbol information comprises:

calculating brightness changes of said image data along a plurality of parallel scanning lines extending in a scanning direction of said image data, and identifying a temporary area having a possibility of corresponding to said symbol information when the brightness changes exceed a predetermined brightness change threshold,

calculating correlations of said temporary area with a first neighboring area neighboring the temporary area in a first direction perpendicular to the scanning direction and a second neighboring area neighboring the temporary area in a second direction perpendicular to the scanning direction and opposite to the first direction and creating a correlation map indicating the correlation of the temporary area to the first neighboring area and the second neighboring area,

searching said correlation map a presence of a predetermined basic barcode pattern and labeling the area judged as having said predetermined basic barcode pattern, and

detecting the position of said symbol information recorded on said medium based on said labeled area,

wherein, in the correlation map, a high correlation area is an area in which the correlation of the temporary area with the first neighboring area and the second neighboring area exceeds a predetermined correlation threshold; and

wherein said labeling the area comprises judging that the temporary area includes the predetermined basic barcode pattern when a ratio of high correlation areas to a total area of temporary area exceeds a predetermined ratio threshold or based on a position of said high correlation areas;

wherein in the searching said correlation map,

4

> basic pattern areas are formed by shifting elements
> one by one in said correlation map, every basic pattern
> area is judged whether a basic pattern is present or not,
> according to the ratio of high correlation area to an area
> subject to judgment, or the position of high correlation
> area in the basic pattern; when the basic pattern is not
> judged as said basic barcode, said basic pattern is
> regarded uncertain; when the following basic pattern
> after the shift by one element is judged as the
> predetermined basic barcode pattern, said basic pattern
> regarded uncertain is now judged as the predetermined
> basic barcode pattern.

Id. at 27–28.

Independent claims 3 and 5 are system claims that include claim language similar to claims 8 and 10, respectively. *See* Appeal Br. 14–16; *see also id.* at 23–25.

REJECTION

The Examiner maintains, and Appellant requests review of, the rejection of claims 3, 5, 8, and 10 under 35 U.S.C. § 101 as "directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more." Final Act. 3.

OPINION

Having considered the respective positions advanced by the Examiner and Appellant in light of this appeal record, and for the reasons stated below, we do not sustain the Examiner's rejection under 35 U.S.C. § 101.

> A. *The Examiner's Rejection*

The Examiner rejects claims 3, 5, 8, and 10 under 35 U.S.C. § 101 as directed to an abstract idea without significantly more. Final Act. 3. Claims

8 and 10 recite, "A method for detecting a physical position of symbol information on a medium and decoding the symbol information." Appeal Br. 25–27. The Examiner determines that, the steps of "calculating brightness changes," "calculating correlations . . . and creating a correlation map," "searching [the] correlation map," and "detecting the position of [the] symbol information" amount to "mathematical relationship/formulas" that are "similar to the concepts that have been identified as abstract by the courts in [*Digitech Image Techs., LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014),] which involved functions of organizing and manipulating information through mathematic correlations[,] and/or [*In re Abele*, 684 F,2d 902 (CCPA 1982),] which involved functions of calculating the differen[ce] between local and average data values." Final Act. 9.

The Examiner determines that the claims do not include additional elements that are sufficient to amount to "significantly more" than the judicial exception because the claimed steps are performed by a processor, which "is considered to amount to nothing more than requiring a generic computer to carry out the abstract idea itself." *Id.* at 10. The Examiner further determines that the steps of capturing an imaging device, an image of the medium on which the symbol information is recorded, converting the image into image data, storing the image data, and retrieving the image data "are considered mere routine data gathering steps necessary to obtain information to perform the analyzing/decoding, and are therefore considered insignificant extrasolution activities that do not add significantly more to the judicial exception." *Id.*

B.   *Appellant's Contentions*

Appellant argues that the claims are not directed to an abstract idea because "the claims result in an improvement in operations of a computer," "making it possible to more accurately identify a location of a barcode on a surface, even if the barcode is obscured or damaged" (Appeal Br. 13–14 (citing Spec. ¶ 78)), and the claims include limitations specifically directed to the noted improvement in computer operation. *Id.* at 16–17.

C.   *Principles of Law*

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. The U.S. Supreme Court, however, has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Court's two-part framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental

economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); "tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores" (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

If the claim is "directed to" an abstract idea, we turn to the second part of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (quotation marks omitted). "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.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

In January 2019, the U.S. Patent and Trademark Office (USPTO) published revised guidance on the application of § 101. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019)

("2019 Revised Guidance").[3],[4] Consistent[5] with the 2019 Revised Guidance and the October 2019 Update, we first look to whether the claim recites:

> (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes) ("Step 2A, Prong One"); and

> (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h) (9th ed. Rev. 08.2017, Jan. 2018)) ("Step 2A, Prong Two").[6]

2019 Revised Guidance, 84 Fed. Reg. at 52–55.

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[3] The Office issued further guidance on October 17, 2019, clarifying the 2019 Revised Guidance. USPTO, *October 2019 Update: Subject Matter Eligibility* (the "October 2019 Update") (available at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf).

[4] Neither the Examiner nor Appellant had benefit of this Guidance when advocating their respective positions concerning subject matter eligibility.

[5] Our reviewing court has explained that the 2019 Revised Guidance "cannot modify or supplant the Supreme Court's law regarding patent eligibility, or [our reviewing court's] interpretation and application thereof." *In re Rudy*, 956 F.3d 1379, 1383 (Fed. Cir. Apr. 24, 2020). Our decision, therefore, is based upon applicable statute and precedent of the United States Supreme Court and the Court of Appeals for the Federal Circuit. This decision applies the analytical framework set forth in the 2019 Revised Guidance, and it does so in a manner consistent with statute and precedent.

[6] This evaluation is performed by (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception, and (b) evaluating those additional elements individually and in combination to determine whether the claim as a whole integrates the exception into a practical application. *See* 2019 Revised Guidance - Section III(A)(2), 84 Fed. Reg. 54–55.

Consistent with the guidance, only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look, under Step 2B, to whether the claim:

> (3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or
>
> (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

2019 Revised Guidance, 84 Fed. Reg. at 52–56.

D. Analysis

Pursuant to the U.S. Supreme Court's *Mayo* and *Alice* framework and consistent with the Guidance, we consider whether the claim recites a judicial exception. 2019 Revised Guidance, 84 Fed. Reg. at 51. The Guidance synthesizes the key concepts identified by the courts as abstract ideas into three primary subject-matter groupings: mathematical concepts, certain methods of organizing human activity (e.g., a fundamental economic practice), and mental processes. *Id.* at 52. For the reasons discussed below, independent claims 3, 5, 8, and 10 recite mathematical concepts.

Claim 8 is reproduced below with emphases added to the key recitations that are mathematical concepts.

> 8. A method for detecting a physical position of symbol information on a medium and decoding the symbol information, the method comprising:
>
> optically capturing, with an imaging device, an image of the medium on which symbol information is recorded and converting the image into image data;

storing said image data in a storage unit;

retrieving said image data and **detecting the physical position of said symbol information recorded on said medium**; and

decoding the symbol information located at the detected physical position;

wherein said detecting the physical position of said symbol information comprises:

calculating brightness changes of said image data along a plurality of parallel scanning lines extending in a scanning direction of said image data, and identifying a temporary area having a possibility of corresponding to said symbol information when the brightness changes exceed a predetermined brightness change threshold,

calculating correlations of said temporary area with a first neighboring area neighboring the temporary area in a first direction perpendicular to the scanning direction and a second neighboring area neighboring the temporary area in a second direction perpendicular to the scanning direction and opposite to the first direction and creating a correlation map indicating the correlation of the temporary area to the first neighboring area and the second neighboring area,

searching said correlation map for a presence of a predetermined basic barcode pattern and labeling an area judged as having said predetermined basic barcode pattern, and

detecting the position of said symbol information recorded on said medium based on said labeled area,

wherein, in the correlation map, a high correlation area is an area in which the correlation of the temporary area with the first neighboring area and the second neighboring area exceeds a predetermined correlation threshold; and

11

wherein said labeling the area comprises judging that the temporary area includes the predetermined basic barcode pattern when a ratio of high correlation areas to a total area of temporary area exceeds a predetermined ratio threshold or based on a position of said high correlation areas;

wherein the temporary area includes the predetermined basic barcode even if a sum of element values of all elements in said basic pattern is smaller than the sum of the element values obtained when all elements are of high correlation as long as the sum of element values of all elements in said basic pattern is equal to or larger than a predetermined value.

Appeal Br. 25–27 (Claims App.) (emphasis added). Independent claims 10 recites a method, and claims 3 and 5 recite a symbol information reader having a position detection processer, performing similar mathematical concepts as those identified in claim 8 above.

The Specification explains that: (1) at the temporary area judging unit, brightness changes are calculated using variance or standard deviation (Spec. ¶ 24); (2) at the correlation map creating unit, correlation calculations are implemented to discriminate a barcode symbol from other symbol information (*id.* ¶ 25); (3) at the labeling unit, multiple basic barcode symbol patterns are used to search the correlation map for the presence of a basic barcode pattern (*id.* ¶¶ 53, 56); and (4) at the position determining unit, calculations are performed (e.g., the center of gravity of the barcode map is calculated) to detect the position of the barcode symbol on a medium (*id.* at ¶¶ 57–60). Thus, as the Examiner determines, at least each of the steps in claims 8 and 10 of "calculating brightness changes," "calculating correlations . . . and creating a correlation map," "searching [the] correlation map," and "detecting the position of [the] symbol information," and at least each of the corresponding recitations of the symbol information reader in

claims 3 and 5 is a mathematical calculation (Final Act. 8–9, 12), which is one of the mathematical concepts identified in the 2019 Revised Guidance. 2019 Revised Guidance, 84 Fed. Reg. at 52; *see also, e.g.*, *Diamond*, 450 U.S. 175 at 191 ("A mathematical formula as such is not accorded the protection of our patent laws."). Accordingly, each of claims 3, 5, 8, and 10 recite an abstract idea.

Because each independent claim (and thus all claims on appeal) recites an abstract idea, we next determine, pursuant to the precedent of the U.S. Supreme Court and our reviewing court and consistent with the 2019 Revised Guidance, whether the recited judicial exception is integrated into a practical application. 2019 Revised Guidance, 84 Fed. Reg. at 51. According to the 2019 Revised Guidance, when a claim recites a judicial exception and fails to integrate the exception into a practical application, the claim is "directed to" the judicial exception. *Id.* The claim may integrate the judicial exception when, for example, it reflects an improvement to technology or a technical field. *Id.* at 55.

As Appellant argues, the Specification explains that the "invention provides a symbol information reader capable of accurately reading the entire symbol information while preventing mis-judgments on reading of symbol information such as barcode symbols, a method for reading symbol information[,] and a program to execute the method." Spec. ¶ 10; *see also id.* ¶ 78 ("[M]isjudgment can be prevented when symbol information such as a barcode symbol pattern is read, enabling accurate reading of the entire symbol information."). As Appellant argues, the claims are not "directed to" an abstract idea because the claims integrate the mathematical calculations

13

into improving claim 3 and 5's symbol information reader, and claim 8 and 10's method. *See* Appeal Br. 13–14, 16–18.

The Examiner maintains that the only improvement is to an abstract idea, i.e., "the algorithm for detecting symbol information in an image, not improving the imaging device or the processor itself[,]" and thus the claims are "directed to an abstract idea." Ans. 4–5. The Examiner is correct that our reviewing court has stated that "a claim for a new abstract idea is still an abstract idea." *Id.* (quoting *Synopsys v. Mentor Graphics Corp.*, 839 F.3d 1138 (Fed. Cir. 2016)). As discussed above, however, the mathematical calculations recited in claims 8 and 10 improve a method of reading, i.e., detecting the physical position of, and decoding, symbol information, rather than only improving upon an abstract idea. Similarly, the position detection processer recited in claims 3 and 5, which performs similar mathematical calculations as recited in method claims 8 and 10, improves a symbol information reader.

Claims 8 and 10 before us are similar to, for example, those of *SiRF Tech., Inc. v. International Trade Commission*, 601 F.3d 1319, 1331–33 (Fed. Cir. 2010). In *SiRF*, the claims at issue recited a method for calculating the position of a GPS receiver by providing pseudoranges and making various estimates. *Id.* at 1332. Our reviewing court determined that a GPS receiver is a machine and is integral to each claim at issue. *Id.* The court further determined that the GPS receiver in the claims "places a meaningful limit on the scope of the claims." *Id.* at 1332–1333.

Claims 8 and 10 require an "imaging device" akin to the GPS receiver of *SiRF*. The methods of claims 8 and 10 cannot be performed without this particular machine. *SiRF* at 1332–1333; *see also Thales Visionix Inc. v. U.S.*,

850 F.3d 1343 (Fed. Cir. 2017) (holding that claims directed to system for tracking object's motion with two inertial sensors were patent eligible); *McRO, Inc. v. Bandai Namco Games Am.*, 837 F.3d 1299 (Fed. Cir. 2016) (holding that claim focused on specific asserted improvement in computer animation was patent eligible). Similarly, the symbol information reader of claims 3 and 5 also requires an imaging device. Claims 3 and 5 also require a position detection processor configured as those claims recite. Although claims 8 and 10 do not recite "a position detection processor," claims 8 and 10 recite the processing steps performed by the position detection processor recited in claims 3 and 5.

Consequently, claims 3, 5, 8 and 10 recite new and useful techniques that involve a particular combination of optically capturing an image with an imaging device, and processing the data received from the imaging device in a specific way to more accurately detect a physical position of symbol information, e.g., a barcode, on a surface, even if the barcode is obscured or damaged. *See* Appeal Br. 13–14; *see also* Spec. ¶¶ 10, 78. "That a mathematical equation is required to complete the claimed method and system does not doom the claim[] to abstraction." *Thales*, 850 F.3d at 1349.

Because independent claims 8 and 10 integrate the recited abstract idea into a practical application, we determine that claims 8 and 10 are not "directed to" an abstract idea. For similar reasons, we determine independent claims 3 and 5, which recite limitations comparable to those of claims 8 and 10, are also not "directed to" an abstract idea. We, therefore, do not sustain the Examiner's rejections under 35 U.S.C. § 101.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
3, 5, 8, 10	101	Eligibility		3, 5, 8, 10
Overall Outcome				3, 5, 8, 10

<u>REVERSED</u>