



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/799,709	04/29/2010	Gerd Binnig	DEF-017	4412
47713	7590	09/30/2019	EXAMINER	
IMPERIUM PATENT WORKS			MORGAN, ROBERT W	
P.O. BOX 607			ART UNIT	PAPER NUMBER
Pleasanton, CA 94566			3626	
			MAIL DATE	DELIVERY MODE
			09/30/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GERD BINNIG, GUENTER SCHMIDT,
and MARKUS RINECKER

Appeal 2018-004044
Application 12/799,709
Technology Center 3600

Before MAHSHID D. SAADAT, JOHNNY A. KUMAR, and
JOHN A. EVANS, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–24. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Definiens AG, which is owned by AstraZeneca. Appeal Br. 1.

STATEMENT OF THE CASE

Appellant's invention relates to "generating image-based patient profiles with a list of measured values and indications for abnormalities of those values that are outside of a given norm." Spec. ¶ 1. Exemplary claim 1 under appeal reads as follows:

1. A method comprising:
 - analyzing a digital image;
 - detecting a group of objects in the image, wherein the group of objects includes normal anatomical objects and abnormal anatomical objects;
 - measuring a value related to the group of objects in the image;
 - displaying the measured value in a patient-profile list;
 - indicating that the measured value falls outside a normal range;
 - identifying the abnormal anatomical objects as potentially diseased based on the measured value falling outside the normal range;
 - navigating a user to a section of the digital image containing the abnormal anatomical objects from the group of objects when the user selects an area on a graphical user interface that is associated with the measured value that falls outside the normal range; and
 - displaying the abnormal anatomical objects on the graphical user interface.

Appeal Br. 38 (Claims App.).

REFERENCES and REJECTIONS

Claims 1–24 stand rejected under 35 U.S.C. § 101 for being directed to patent-ineligible subject matter. *See* Final Act. 2–5.

Claims 1–5, 7–9, 11–17, and 19–24 stand rejected 35 U.S.C. § 103(a) as being unpatentable over Collins (US 2006/0274928 A1; pub. Dec. 7, 2006), Prokoski (US 2010/0191541 A1; pub. July 29, 2010), and Patriarche (US 2010/0195883 A1; Aug. 5, 2010). *See* Final Act. 5–25.

Claims 6 and 18 stand rejected 35 U.S.C. § 103(a) as being unpatentable over Collins, Prokoski, Patriarche, and Smith (US 2008/0260218 A1; pub. Oct. 23, 2008). *See* Final Act. 25–26.

Claim 10 stands rejected 35 U.S.C. § 103(a) as being unpatentable over Collins, Prokoski, Patriarche, and Gholap (US 2005/0136509 A1; pub. June 23, 2005). *See* Final Act. 26.

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellant’s arguments that the Examiner errs. We are persuaded the Examiner erred in rejecting the claims under 35 U.S.C. § 101 for being directed to patent-ineligible subject matter. We are also persuaded the Examiner erred in rejecting the claims under 35 U.S.C. § 103(a) as obvious in view of the cited references.

REJECTION OF CLAIMS UNDER § 101

Principles of Law

Section 101 of the Patent Act provides that “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” is patent eligible. 35 U.S.C. § 101. But the Supreme Court has long recognized an implicit exception to this section: “Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (quoting *Ass’n for*

Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 589 (2013)). To determine whether a claim falls within one of these excluded categories, the Court has set out a two-part framework. The framework requires us first to consider whether the claim is “directed to one of those patent-ineligible concepts.” *Alice*, 573 U.S. at 217. If so, we then examine “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*, 573 U.S. at 217 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 78, 79 (2012)). That is, we examine the claims for an “inventive concept,” “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.’” *Alice*, 573 U.S. at 217–18 (alteration in original) (quoting *Mayo*, 566 U.S. at 72–73).

In January 2019, the USPTO published revised guidance on the application of § 101. *See 2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Revised Guidance”). Under that guidance, 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 activities such as a fundamental economic practice, or mental processes); and
- (2) additional elements that integrate the judicial exception into a practical application (*see* Manual of Patent Examining Procedure (MPEP) §§ 2106.05(a)–(c), (e)–(h) (9th ed. Rev. 08.2017, Jan. 2018)).

Only if a claim (1) recites a judicial exception, and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not well-understood, routine, and conventional in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Revised Guidance, 84 Fed. Reg. at 56.

Arguments

The Examiner finds the claims recite method steps include analyzing a data image related to a group of anatomical objects by measuring certain values related to the objects and displaying the objects that are identified to be abnormal. Non-Final Act. 2–3. The Examiner relies on the Court decision in *SmartGene*² and *Cyberfone*³ and concludes the claimed steps are directed to an “abstract idea of using categories to organize, store and transmit information.” Non-Final Act. 3. Additionally, the Examiner finds:

The claim(s) does/do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements amount to no more than generic computer components that serve to merely link the abstract idea to a particular technological environment (*i.e.* databases, data analysis servers & graphical user interface) performing routine and conventional activities that are well-understood in the industry (*i.e.* selecting data, presenting data, comparing data, analyzing data, etc.). Applicant’s specification describes conventional hardware for implementing the above described functions including databases, data analysis servers & graphical user interface. ([35-44]) The claims do not amount

² *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 F. App’x 950 (Fed. Cir. 2014).

³ *Cyberfone Systems, LLC v. CNN Interactive Group, Inc.*, 558 F. App’x 988 (Fed. Cir. 2014).

to significantly more than the underlying abstract idea of collecting and comparing known information.

Non-Final Act. 4.

Appellant contends the Examiner erred because, given the specific limitations in the claims relating to “identifying diseased tissue (such as cancerous anatomical objects) and navigating a user to the section of a digital image that contains the diseased tissue,” the claims “are not simply directed to manipulating information on a computer without performing more than well-understood, routine, conventional activity previously engaged in by researchers in the field.” Appeal Br. 9–10 (citing *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012)). Appellant further argues:

The recited diagnostic method is significantly more than simply using a computer to perform a series of mental steps that physicians have regularly performed in their heads. It is not possible in a mental step for a physician to measure values related to groups of anatomical objects in an image and then to identify those objects whose measured values fall outside a defined range. [A] pathologist can manually inspect an image of a tissue sample at low resolution and then examine only those areas at high resolution that look interesting at the lower resolution. This manual inspection necessarily overlooks important data and leads to errors in diagnosis. If a pathologist were to search an entire tissue sample manually at high resolution, it would take too long, would result in inconsistent recording of the manual observations, complex statistical patterns would not be recognized, and any resulting diagnosis would be less accurate. (See Specification, ¶[0053]).

Appeal Br. 10.

Finally, Appellant argues the Examiner erred in describing the additional element in the claim as “generic computer functions” because

“[t]he claims recite steps that are linked to the particular scientific environment of diagnosing diseased and cancerous anatomical objects in an image of a patient’s tissue by measuring those objects in the image and then locating those diseased objects in the image for the user, such as a physician.” *See* Appeal Br. 12.

Step 2A, Prong One – Recited Judicial Exception

Step 2A of the Revised Guidance is a two-prong inquiry. In Prong One we evaluate whether the claim recites a judicial exception. For abstract ideas, Prong One represents a change as compared to prior guidance because we here determine whether the claim recites mathematical concepts, certain methods of organizing human activity, or mental processes (concepts performed in the human mind (including an observation, evaluation, judgment, opinion)).

We conclude at least the following limitation of claim 1 recites a mental process that practically could be performed via pen and paper or in a person’s mind:

analyzing a digital image;

detecting a group of objects in the image, . . . ;

measuring a value related to the group of objects in the image;

indicating that the measured value falls outside a normal range;

identifying the abnormal anatomical objects as potentially diseased based on the measured value falling outside the normal range;

Appeal Br. 38 (Claims App.). Other than reciting “navigating the user to a section of the digital image . . . ; and displaying the abnormal anatomical

objects on the graphical user interface,” the claim involves “an observation, evaluation, judgment, opinion” and includes nothing that could not be performed manually and in the human mind. Similar limitations are recited in claims 20 and 24 (reciting steps similar to those in claim 1) and claim 14 (reciting a system for generating the images, a database for storing the images, a data analysis server and a graphical user interface in addition for performing the functionalities addressed above in claim 1).

Because we conclude the independent claims recite an abstract idea, the claims require further analysis for a practical application of the judicial exception.

Step 2A, Prong Two –Practical Application

If a claim recites a judicial exception, in Prong Two we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.

In addition to the abstract steps recited in the limitations listed above, claim 1 further recites:

navigating a user to a section of the digital image containing the abnormal anatomical objects from the group of objects when the user selects an area on a graphical user interface that is associated with the measured value that falls outside the normal range; and

displaying the abnormal anatomical objects on the graphical user interface.

Appeal Br. 38 (Claims App.). Although we agree with the Examiner that the claims relate to a diagnosis process in the medical field, which relies on

determining whether the measured values are within a specific/normal range or fall outside that range (Ans. 7), Appellant’s Specification describes the steps taken by the computer-aided pathology (CAP) system for creating tissue-based patient profiles (TPPs), which are “organized hierarchically and divided into classified regions.” Spec. ¶¶ 44–45. The disclosed process responds to the need for comprehensively collecting the sizes of objects, wherein “the comprehensive measurement of objects in a CT scan or in a scan of a tissue sample cannot be performed manually.” Spec. ¶ 40.

Additionally, Appellant’s disclosure describes the benefits of the CAP as follows:

Computer-aided pathology provides at least three benefits. First, the TPPs quantify the analyzed parameters, and the quantification allows an objectification of the evaluation. Second, the problem of finding the “needle in the haystack” is solved or at least drastically reduced. Third, complex tissue profiles allow for a better diagnosis than tissue classifications or evaluations with mostly only one (a grading value) or in some cases only a few values being presented.

Spec. ¶ 46.

Considering claim 1 as a whole, the above-mentioned limitations and the final steps of “identifying the abnormal anatomical objects as potentially diseased based on the measured value falling outside the normal range” and “navigating a user to a section of the digital image containing the abnormal anatomical objects from the group of objects when the user selects an area on a graphical user interface . . .,” the recited identifying and displaying steps do “integrate[] a judicial exception into a practical application [in that they] apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit[ation] on the judicial exception, such that the claim is more

than a drafting effort designed to monopolize the judicial exception.” Revised Guidance at 53. Specifically, the additional elements recite a specific manner in which doctors can identify the abnormal anatomical objects as potentially diseased based on the measured values that fall outside the normal range, or the “(fingerprint) associated with a particular disease.” See Reply Br. 6; *see also* MPEP 2106.05(c), (e). In fact, the recited “identifying” and “navigating” steps are the types of functions more typical of computer operations, as opposed to human activity. The human analogy equivalent would be an individual performing all the measurements, indicating and identifying the measurements that fall outside the normal range, and navigating the user to a section of the image containing the abnormal anatomical objects, which is plausible, but far-fetched given the technical nature of the measurements and presenting the data required in the claimed steps in light of the Specification.

In summary, the above-discussed limitations result in identifying particular anatomical objects that fit a pattern of measured values associated with a particular disease, and amount to more than the mere manipulation of data. See MPEP 2106.05(c), (e). (“Particular Transformation” and “Other Meaningful Limitations”). Thus, we conclude that claim 1 recites additional elements that integrate the abstract idea into a practical application. Claims 14, 20, and 24 similarly integrate the abstract idea into a practical application. Because claims 1, 14, 20, and 24 integrate the recited judicial exception into a practical application, they are not “directed to” a judicial exception and, therefore, our inquiry ends. For these reasons, under the Revised Guidance, we reverse the Examiner’s § 101 rejection of independent claims 1, 14, 20, and 24, as well as the Examiner’s rejection of

dependent claims 2–13, 15–19, and 21–23, which stand with the independent claims from which they depend.

REJECTION OF CLAIMS UNDER § 103

First, Appellant contends Collins does not disclose identifying abnormal anatomical objects based on a measured value outside a normal range, and instead “determines texture patterns of lesions in breast cancer based on the BI-RADS lexicon (breast imaging reporting and data system).” Appeal Br. 14. According to Appellant, “Collins does not distinguish ‘normal’ lesions from abnormal lesions based on a measured value for the abnormal lesions falling outside a ‘normal’ range. All lesions are abnormal and potentially diseased.” Appeal Br. 14–15 (citing Collins, ¶ 55). Second, Appellant contends Patriarche also fails to detect anatomical objects and merely identifies “types of tissues.” Appeal Br. 15 (citing Patriarche ¶¶ 16, 25, 26, 78). Lastly, Appellant contends Patriarche fails to teach the navigating step that identifies abnormal anatomical objects when the user selects measured values outside the normal range. Appeal Br. 17.

The Examiner responds that, based on the broadest reasonable interpretation of the claims, Patriarche teaches the recited anatomical objects as the target tissue. Ans. 10 (citing Patriarche ¶¶ 24, 135). Additionally, the Examiner explains:

The Examiner points out Applicants’ statements in support of this argument are erred because “anatomical” is defined as “the structure of organisms” & the definition of “lesion” is “Any of various pathological or traumatic changes in a bodily organ or tissue, including tumors, ulcers, sores and wounds” (see: Merriam-Webster Dictionary & American Heritage Dictionary). Therefore by definition lesions & tissue are anatomical objects. In addition, Applicant’s erred statement continues saying “lesions are not anatomical objects with a measured value that

has a normal range”, however Examiner points out that said “Patriarche” reference specifically discloses steps “. . . to separate disease related changes from non-disease related changes” utilizing “Significant Region Detection/Identification” means (see: Patriarche [135-137]). Therefore separating identified tissue as “disease” or “non-disease” is a specific cited example teaching “abnormal” “anatomical object”.

Ans. 10–11.

We do not agree with the Examiner’s claim interpretation and conclusion. As argued by Appellant (Reply Br. 12), Patriarche does not identify normal and abnormal anatomical objects and instead, is concerned with changes in the target tissue in a diseased organ, such as a lesion, and identifying the disease-related boundaries and changes. *See* Patriarche Abs., ¶¶ 24, 135. In other words, as stated by Appellant, “Patriarche does not detect and identify normal anatomical objects and abnormal anatomical objects but rather only normal tissue types and abnormal tissue types. Lesions are identified in Patriarche as various abnormal tissue types.” Reply Br. 12.

Therefore, we agree with Appellant that identifying the target tissue in Patriarche is not related to the recited “detecting normal anatomical objects and abnormal anatomical objects.” *See* Reply Br. 12–14. Therefore, we do not sustain the rejection of claim 1, independent claims 14, 20, and 24, which recite similar features, or the remaining claims dependent therefrom.

CONCLUSION

We reverse the Examiner’s decision rejecting claims 1–24 under 35 U.S.C. § 101.

Appeal 2018-004044
Application 12/799,709

We reverse the Examiner's decision rejecting claims 1–24 under
35 U.S.C. § 103(a).

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–24	§ 101		1–24
1–24	§ 103		1–24
Overall Outcome			1–24

REVERSED