UNITED STATES PATENT AND TRADEMARK OFFICE

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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 JAMES S. COX

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Appeal 2020-001787
Application 15/045,451
Technology Center 3600

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Before JAMES P. CALVE, NINA L. MEDLOCK, and
BRADLEY B. BAYAT, *Administrative Patent Judges*.

MEDLOCK, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's
final rejection of claims 1–4, 6–14, and 16–20. We have jurisdiction under
35 U.S.C. § 6(b).

We REVERSE.

CLAIMED INVENTION

Appellant describes that "[t]he present application relates generally to an improved data processing apparatus and method" and more specifically to "mechanisms for performing cognitive evaluation of assessment questions and answers to determine patient characteristics corresponding to a medical condition" (Spec. ¶ 1).

Claims 1, 11, and 20 are the independent claims on appeal. Claim 1, reproduced below with bracketed notations added, is illustrative of the claimed subject matter:

> 1. A method, in a data processing system comprising a processor and a memory, for determining values to associate with medical conditions of a patient, comprising:
>
> [(a)] receiving, by the data processing system, a patient assessment data structure comprising a natural language question and a corresponding answer, about a patient, provided in response to the question, wherein the patient assessment data structure stores data corresponding to a plurality of natural language questions and corresponding answers of a questionnaire administered to the patient or another person about the patient;
>
> [(b)] performing, by a cognitive assessment question answering evaluation system of the data processing system, cognitive natural language processing on the patient assessment to extract features from the natural language question and corresponding answer, wherein the cognitive assessment question answering evaluation system comprises a plurality of stages of logic for evaluating the natural language question and the corresponding answer to determine a meaning, veracity, and accuracy of the answer to the natural language question in the patient assessment;
>
> [(c)] evaluating, by query generation logic of the cognitive assessment question answering evaluation system of the data processing system, the extracted features within a context of a preexisting electronic medical record of the patient

at least by generating one or more queries based on the extracted features and applying the one or more queries to a corpus of electronic documents specific to the patient;

[(d)] determining, by patient data structure/annotation generator logic of the cognitive assessment question answering evaluation system of the data processing system, a value for a medical condition of the patient based on results of evaluating the extracted features within the context of the pre-existing electronic medical record of the patient; and

[(e)] storing, by patient data structure/annotations logic of the cognitive assessment question answering evaluation system of the data processing system, the determined value for the medical condition in the electronic medical record for the patient, wherein evaluating the extracted features comprises converting the extracted features from the question and the corresponding answer into a natural language statement and generating the one or more queries based on the natural language statement, and wherein determining the value for the medical condition comprises associating with the natural language statement a confidence value that the natural language statement is correct.

REJECTION

Claims 1–4, 6–14, and 16–20 are rejected under 35 U.S.C. § 101 as directed to a judicial exception without significantly more.

ANALYSIS

Under 35 U.S.C. § 101, 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 Supreme Court, however, has long interpreted § 101 to include an implicit exception: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

The Supreme Court, in *Alice*, reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (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 Corp.*, 573 U.S. at 217. The first step in that analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts." *Id.* If the claims are not directed to a patent-ineligible concept, e.g., an abstract idea, 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 there are additional elements that "'transform the nature of the claim' into a patent-eligible application." *Id.* (quoting *Mayo*, 566 U.S. at 79, 78). This is "a search for an 'inventive concept' — *i.e.*, 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.'" *Id.* at 217–18 (alteration in original).

The U.S. Patent and Trademark Office (the "USPTO") published revised guidance on January 7, 2019 for use by USPTO personnel in evaluating subject matter eligibility under 35 U.S.C. § 101. 2019 REVISED PATENT SUBJECT MATTER ELIGIBILITY GUIDANCE, 84 Fed. Reg. 50, 57 (Jan. 7, 2019) (the "2019 Revised Guidance").[2] That guidance revised the USPTO's examination procedure with respect to the first step of the

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[2] The USPTO issued an update on October 17, 2019 (the "October 2019 Update: Subject Matter Eligibility," available at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf) clarifying the 2019 Revised Guidance in response to public comments.

Mayo/*Alice* framework by (1) "[p]roviding groupings of subject matter that [are] considered an abstract idea"; and (2) clarifying that a claim is not "directed to" a judicial exception if the judicial exception is integrated into a practical application of that exception. *Id.* at 50.

The first step, as set forth in the 2019 Revised Guidance (i.e., Step 2A), is, thus, a two-prong test. In Step 2A, Prong One, we look to whether the claim recites a judicial exception, e.g., one of the following three groupings of abstract ideas: (1) mathematical concepts; (2) certain methods of organizing human activity, e.g., fundamental economic principles or practices, commercial or legal interactions; and (3) mental processes. 2019 Revised Guidance, 84 Fed. Reg. at 54. If so, we next determine, in Step 2A, Prong Two, whether the claim as a whole integrates the recited judicial exception into a practical application, i.e., whether the additional elements recited in the claim beyond the judicial exception, 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. *Id.* at 54–55. Only if the claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application do we then conclude that the claim is "directed to" the judicial exception, e.g., an abstract idea. *Id.*

If the claim is determined to be directed to a judicial exception under revised Step 2A, we evaluate the additional elements, individually and in combination, in Step 2B, to determine whether they provide an inventive concept, i.e., whether the additional elements or combination of elements amounts to significantly more than the judicial exception itself; only then, is the claim patent eligible. 2019 Revised Guidance, 84 Fed. Reg. at 56.

The Examiner determined here that the claims recite "determin[ing] values to associate with medical conditions of patients in medical records," i.e., a method of organizing human activity and, therefore, an abstract idea, and that the judicial exception, i.e., the abstract idea, is not integrated into a practical application (Final Act. 2–3). The Examiner also determined that the claims do not include additional elements sufficient to amount to significantly more than the abstract idea itself, i.e., that "[t]he use of a computer or processor to merely automate or implement the abstract idea cannot provide significantly more than the abstract idea itself" (*id.* at 3–4).

Independent Claim 1 and Dependent Claims 2–4 and 6–10

The Federal Circuit has explained that "the 'directed to' inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether 'their character as a whole is directed to excluded subject matter.'" *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (quoting *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015)). It asks whether the focus of the claims is on a specific improvement in relevant technology or on a process that itself qualifies as an "abstract idea" for which computers are invoked merely as a tool. *See id.* at 1335–36.

Here, the Specification is titled "COGNITIVE EVALUATION OF ASSESSMENT QUESTIONS AND ANSWERS TO DETERMINE PATIENT CHARACTERISTICS," and describes that "providing treatment and care for patients having illness requiring ongoing treatment is a major issue in modern medicine" (Spec. ¶ 33). "Many times this ongoing treatment and care is a shared responsibility between the medical workers, e.g., doctors, nurses, etc. and the patient," with the patient performing

certain actions on his or her own to provide self-treatment for the illness, and with the medical workers providing monitoring and periodic checks of the patient's progress to ensure that the patient is adhering to the treatment needed to control and/or improve the patient's condition (*id.*). The Specification, thus, describes that a number of mechanisms have been developed for assisting the patient and medical workers in handling their shared responsibilities, including mechanisms for generating patient care plans based on the patient's medical condition (*id.* ¶ 34).[3]

The Specification further describes that in order to manage a patient's health, it is important to periodically administer health assessments to establish where the patient is on the health continuum (Spec.¶ 220). The health assessment may take different forms depending on its particular goals (*id.* ¶ 221). For example, many health assessments are performed by administering a questionnaire to the patient and receiving and processing the patient's responses to determine the patient's current status with regard to a particular medical condition; in other cases, the health assessment may require that the patient be physically examined or that laboratory tests be performed to obtain information regarding the patient's current health condition (*id.*). The information gathered from the health assessment may be used to drive updates to the patient information in the patient registry, e.g., by updating personal information about the patient, adding entries (new medical codes) to the patient's electronic medical records to reflect a

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[3] The Specification discloses that "[a] 'mechanism,' as the term is used herein, may be an implementation of the functions or aspects of the illustrative embodiments in the form of an apparatus, a procedure, or a computer program product" (Spec. ¶ 29).

diagnosed medical condition as a result of the health assessment, etc. —
updates that may trigger the creation of a new treatment or patient care plan
or the modification of an existing plan (*id.* ¶ 222).

The Specification describes that in an illustrative embodiment, the
health assessments are represented as data structures or electronic documents
representing the questions of a questionnaire and the corresponding answers
provided by the patient (Spec. ¶ 255). Although the assessment responses
are recorded in the patient registry, the Specification explains that the
meaning of the results of the assessment may not be readily apparent to the
automated systems that use this information in performing their respective
operations, e.g., creating a treatment or patient care plan or adjusting or
modifying an existing treatment or patient care plan (*id.* ¶ 251). For
example, without understanding what a question was asking, the answer,
e.g., "no," is not of much use to the automated system; and, even if the
automated system is able to determine what the question is asking, the
automated system does not know how the answer relates to other patient
information (*id.* ¶¶ 251–252). In other words, according to the
Specification, the effect of the answer to a question is dependent on a
number of factors, including what the question is asking, how the patient
interprets the question, and the truthfulness of the patient (*id.* ¶ 252). As
such, "[a] full picture of the patient's medical condition can only be obtained
with regard to an assessment by evaluating the responses of the assessment
in the context of the questions being asked and other patient information
obtained for the patient" (*id.*).

The Specification describes that, in accordance with the claimed
invention, a cognitive assessment evaluation system (which may be part of a

system for generating patient care plans based on the patient's medical condition) utilizes natural language processing ("NLP") to determine the meaning, veracity, and accuracy of an answer to a question in a patient health assessment and generate a corresponding data structure/annotation for patient information (*id.* ¶ 258). Thus, as described in the Specification, the evaluation system receives, as input, a health assessment document, comprising one or more questions about the patient and associated answers, from a patient registry (*id.* ¶ 259) and extracts features, (e.g., titles, section heads, specific textual content, metadata) from the health assessment document to determine the domain of the health assessment, i.e., its subject matter and/or purpose (*id.* ¶ 260). The extracted features are then converted to a natural language statement indicative of the correlation of the question with the answer provided in the health assessment document to thereby identify a patient characteristic (*id.* ¶ 261). For example, if the question in the health assessment document is "are you a smoker?" and the answer is "no," the system generates a statement that "the patient is not a smoker" or "the patient is a nonsmoker" (*id.*); the patient characteristic statement and/or the extracted features are next evaluated in the context of other patient information in the patient registry (e.g., clinical values of patient characteristics, such as blood pressure readings, results of previous health assessments, medical records indicating medical procedures, lifestyle information indicating activities and conditions of the patient, or the like) to determine the relative veracity and accuracy of the answer, i.e., to determine the degree to which the patient characteristic is corroborated (*id.* ¶¶ 255, 262–264). More particularly, one or more search queries are generated based on the patient characteristic statement, i.e., the natural language

statement, and are used in searching the information in the patient registry
(*id.* ¶ 262). Based on the level of corroboration or non-corroboration, a
confidence value (e.g., 0 to 100, where 0 represents no confidence that the
natural language statement is correct and 100 represents full confidence that
the statement is correct) is generated and associated with the
question/answer pair (*id.* ¶¶ 256, 265). Thus, in the example, where the
patient characteristic statement is "patient is not a smoker," if an evaluation
of other patient information (e.g., the patient's previous history of smoking
and recent purchase of a smoking inhibitor) indicates that this statement may
not be true, i.e., that the patient may, in fact, be a smoker, the confidence
value assigned to the characteristic/condition may be a value, e.g., 0.4 or 0.8,
on a sliding scale of 0.0(0) to 1.0 (100), depending on the relative level of
corroboration or non-corroboration (*id.* ¶ 265). In some illustrative
embodiments, the confidence value, if sufficiently low, also may be basis for
modifying, i.e., inverting, the patient characteristic statement and increasing
the confidence value (*id.* ¶ 266).

The resulting data structure, including the patient characteristics and
their confidence, is added to the patient information in the patient registry,
and is used, along with other patient information from the patient registry, in
evaluating the patient's health condition, or a trend in the health of the
patient, in order to generate a new patient care plan, modify an existing plan,
or perform other patient care operations (*id.* ¶¶ 256, 268).

Consistent with this disclosure, claim 1 recites a method, in a data
processing system comprising a processor and a memory, for determining
values to associate with medical conditions of a patient, comprising:
(1) receiving a patient assessment comprising a natural language question

and a corresponding answer about the patient, provided in response to the question, i.e.,

> receiving, by the data processing system, a patient assessment data structure comprising a natural language question and a corresponding answer, about a patient, provided in response to the question, wherein the patient assessment data structure stores data corresponding to a plurality of natural language questions and corresponding answers of a questionnaire administered to the patient or another person about the patient

(step (a)); (2) performing cognitive natural language processing on the patient assessment to extract features from the natural language question and corresponding answer, i.e.,

> performing, by a cognitive assessment question answering evaluation system of the data processing system, cognitive natural language processing on the patient assessment to extract features from the natural language question and corresponding answer, wherein the cognitive assessment question answering evaluation system comprises a plurality of stages of logic for evaluating the natural language question and the corresponding answer to determine a meaning, veracity, and accuracy of the answer to the natural language question in the patient assessment

(step (b)); (3) evaluating the extracted features within the context of the patient's pre-existing medical record, i.e.,

> evaluating, by query generation logic of the cognitive assessment question answering evaluation system of the data processing system, the extracted features within a context of a preexisting electronic medical record of the patient at least by generating one or more queries based on the extracted features and applying the one or more queries to a corpus of electronic documents specific to the patient

(step (c)); and (4) determining a confidence value for a medical condition of the patient based on the results of the evaluation, and storing the value in the patient's electronic medical record, i.e.,

> determining, by patient data structure/annotation generator logic of the cognitive assessment question answering evaluation system of the data processing system, a value for a medical condition of the patient based on results of evaluating the extracted features within the context of the pre-existing electronic medical record of the patient; and

> storing, by patient data structure/annotations logic of the cognitive assessment question answering evaluation system of the data processing system, the determined value for the medical condition in the electronic medical record for the patient, wherein evaluating the extracted features comprises converting the extracted features from the question and the corresponding answer into a natural language statement and generating the one or more queries based on the natural language statement, and wherein determining the value for the medical condition comprises associating with the natural language statement a confidence value that the natural language statement is correct

(steps (d) and (e)).

We are persuaded that even if claim 1 recites an abstract idea, as the Examiner determined, the Examiner has not sufficiently established that the claim fails to improve an existing technology (i.e., automated systems for generating patient care plans based on patient information in a patient registry) and, therefore, in the context of the 2019 Revised Guidance, that the claim fails to integrate the abstract idea into a practical application, or that the claim otherwise fails to recite significantly more than the alleged abstract idea.

The Specification discloses, as described above, that many health assessments are performed by administering a questionnaire to the patient and receiving and processing the patient's responses to determine the

patient's current status with regard to a particular medical condition. And the Specification details the shortcomings of automated systems (that use this information to perform their operations), in terms of both their inability to determine the meaning of the assessment results and their related inability to determine, from the questions and answers in the patient assessment alone, a complete picture of the patient's medical condition (*see, e.g.*, Spec. ¶¶ 251–252).

The Specification describes that the claimed invention addresses these shortcomings by providing a mechanism for performing a cognitive natural language analysis of the questions and answers provided in a patient assessment data structure in the context of other patient information, e.g., the patient's pre-existing medical record and a corpus of electronic documents specific to the patient, to determine the meaning, veracity, and accuracy of the answers to the questions (*id.* ¶ 258). A full and accurate picture of the patient's medical condition is, thus, obtained that can be effectively used by the automated system, e.g., to generate a new treatment care plan for the patient, modify an existing plan, or perform other patient care operations.

The Examiner posits that the judicial exception is not integrated into a practical application because the claims "merely use computer elements as tools to perform abstract ideas and generally link the use of a judicial exception to a particular technological environment" and that "[t]he use of a computer or processor to merely automate or implement the abstract idea cannot provide significantly more than the abstract idea itself" (Final Act. 3–4). But, the Examiner has not addressed whether the functionality described above, viewed in light of Appellant's Specification, entails an improvement in technology and/or a technical field. And, as such, the Examiner has not

established that claim 1 fails to integrate the asserted abstract idea into a practical application.

The Examiner also has not addressed whether the claim limitations, when viewed in light of Appellant's Specification, relate to a challenge particular to automated systems for generating patient treatment plans, and thus, recite significantly more than the alleged abstract idea.

Responding to Appellant's argument that the claimed invention addresses a problem rooted in technology, the Examiner opines, in the Answer, "the claims, aside from the computer technology, may be performed in the human mind by a health care provider" (Ans. 5–6; *see also id.* at 5 ("[A] [d]octor[ ] may read patient assessment data, understand and evaluate the necessary data to calculate a value for a medical condition, and store the value either in his or her mind or on paper.")). Yet, although the claimed process and a person's language recognition may result in similar outcomes, the outcomes are achieved through different processes. One is the way a human recognizes speech, and the other involves performing natural language processing on a question and corresponding answer in a patient assessment data structure to extract features (e.g., titles, section heads, specific textual content, metadata) from the data structure, converting the features to a natural language statement, and generating one or more queries based on the natural language statement that are applied to a corpus of electronic documents to thereby determine a value to be assigned to a medical condition in the patient's electronic medical record.

On this record, we are persuaded that the Examiner erred in rejecting independent claim 1 under 35 U.S.C. § 101. Therefore, we do not sustain

the Examiner's rejection of claim 1. For the same reasons, we also do not sustain the Examiner's rejection of dependent claims 2–4 and 6–10.

Independent Claims 11 and 20 and Dependent Claims 12–14 and 16–19

Independent claims 11 and 20 include limitations substantially similar to the limitations of claim 1. Therefore, we do not sustain the Examiner's rejection under 35 U.S.C. § 101 of independent claims 11 and 20, and claims 12–14 and 16–19, which depend from claim 11, for the same reasons set forth above with respect to claim 1.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–4, 6–14, 16–20	101	Eligibility		1–4, 6–14, 16–20

REVERSED