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 TUOMAS W. SANDHOLM

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Appeal 2018-008048
Application 13/955,966
Technology Center 3600

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Before MURRIEL E. CRAWFORD, TARA L. HUTCHINGS, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

HUTCHINGS, *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 1–21. An oral hearing was held on March 4, 2020.
We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the term "Appellant" to refer to "applicant" as defined in 37 C.F.R.
§ 1.42. Our decision references Appellant's Appeal Brief ("Appeal Br.,"
filed July 7, 2017), Reply Brief ("Reply Br.," filed Aug. 1, 2018), and
Declaration of Tuomas W. Sanders ("Decl," filed Nov. 25, 2015), and the
Examiner's Answer ("Ans.," mailed June 1, 2018), and Final Office Action
("Final Act.," mailed Feb. 16, 2017). Appellant identifies Tuomas W.
Sandholm as the real party in interest. Appeal Br. 3.

CLAIMED INVENTION

Claims 1 and 18 are the independent claims on appeal. Claim 1, reproduced below with bracketed notations added, is illustrative of the claimed subject matter:

1.   A system for developing a course of treatment for a medical condition, comprising:

[(a)]   one or more processors;

[(b)]   a user interface;

[(c)]   a communication port; and

[(d)]   a non-transitory, computer-readable memory comprising one or more programming instructions that, when executed, will cause one or more of the processors to:

[(1)]   identify a description of a sequential game by receiving, via the user interface or the communication port, information corresponding to a medical condition,

[(2)]   identify a set of possible treatment actions that a treater can take to treat the medical condition, and a plurality of sequences for the actions,

[(3)] for each of the plurality of sequences, identify one or more possible medical condition actions that the medical condition can take in response to one or more of the possible treatment actions,

[(4)]   identify a model for the sequential game, wherein:

[(i)]   the game is a large game associated with a large state space;

[(ii)]   the model represents implementation of the possible treatment actions as moves in the sequential game;

[(iii)] the model represents the possible medical condition actions in one or more sequences; and

[(iv)] the model includes information to predict an updated status based on an expected patient response to each of the possible treatment actions in the one or more sequences,

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[(5)] solve the model by applying a game-solving algorithm to the model to generate a treatment plan for the medical condition, where the treatment plan comprises a set of possible treatment actions, and

[(6)] output a report of the treatment plan.

REJECTION

Claims 1–21 are rejected under 35 U.S.C. § 101 as directed to a judicial exception without significantly more.

ANALYSIS

Appellant argues independent claims 1 and 18 as a group. Appeal Br. 9–20. We select independent claim 1 as representative. Claim 18 stands or falls with claim 1. *See* 37 C.F.R. §41.37(c)(1)(iv).

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).

In rejecting the pending claims under 35 U.S.C. § 101, the Examiner determined that claim 1 is directed to "comparing treatment actions and medical condition responses[,] and using rules to generate a treatment plan," which the Examiner determined is a mental process, i.e., an abstract idea. Final Act. 4 ("[t]he processes in these steps can be performed mentally or by using a pen and . . . paper"). The Examiner also found that claim 1 recites a game-solving algorithm to solve a model, which the Examiner determined is a mathematical concept, i.e., an abstract idea. *Id.* at 5. The Examiner further determined that claim 1 does not include additional elements that are sufficient to amount to significantly more than the judicial exception. *Id.* at 5– 6. The Examiner concluded that dependent claims 2–17 do not overcome the deficiencies set forth with respect to independent claim 1. *Id.* at 6–7. The Examiner rejected claims 18–21 for similar reasons similar to those set forth with respect to claims 1–17. *Id.* at 7.

In so doing, the Examiner notified Appellant of the reasons for the rejection under 35 U.S.C. § 101 in a sufficiently articulate and informative manner as to meet the notice requirement of 35 U.S.C. § 132, thereby establishing a prima facie case of patent ineligibility. *See In re Jung*, 637

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F.3d 1356, 1362 (Fed. Cir. 2011) (holding that the USPTO carries its procedural burden of establishing a prima facie case when its rejection satisfies the notice requirements of 35 U.S.C. § 132 by notifying the applicant of the reasons for the rejection, "together with such information and references as may be useful in judging the propriety of continuing [] prosecution"). Appellant's arguments to the contrary are unpersuasive. *See* Appeal Br. 12–15.

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 "Revised Guidance"). That guidance revised the USPTO's examination procedure with respect to the first step of the *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 Revised Guidance, by its terms, applies to all applications, and to all patents resulting from applications, filed before, on, or after January 7, 2019. *Id.*[2]

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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) ("October 2019 Update") clarifying the 2019 Revised Guidance in response to comments solicited from the public.

Step One of the Mayo/Alice Framework (*Revised Guidance*, *Step 2A, Prong One*)

The first step in the *Mayo/Alice* framework, as mentioned above, is to determine whether the claims at issue are "directed to" a patent-ineligible concept, e.g., an abstract idea. *Alice Corp.*, 573 U.S. at 217. This first step, as set forth in the 2019 Revised Guidance (i.e., Step 2A), is 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; *see also id.* at 52 (identifying the three groupings). If so, we next consider whether the claim includes additional elements, beyond the judicial exception, that "integrate the [judicial] exception into a practical application," i.e., that 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 ("Step 2A, Prong Two"). *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 conclude that the claim is "directed to" the judicial exception, e.g., an abstract idea. *Id.*

We are not persuaded by Appellant's arguments that the Examiner erred in determining that claim 1 is directed to an abstract idea. *See* Appeal Br. 10–18 (arguing that the Examiner failed to address the claims as a whole, and provides inadequate support for the rejection). 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

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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, it is clear from the Specification (including the claim language) that the claims focus on an abstract idea, and not on any improvement to technology and/or a technical field.

Appellant's Specification is titled "MEDICAL TREATMENT PLANNING VIA SEQUENTIAL GAMES," and describes that over the course of treating a patient for a medical condition, the patient's medical condition may improve, worsen, or remain static. Spec. ¶¶ 1–2. In addition, the patient may develop other medical conditions over time. *Id.* ¶ 2. The Specification notes that "improved methods of identifying and designing pharmaceutical or other courses of treatment are desirable." *Id.* ¶ 4. And the claimed invention seeks "to solv[e] some or all of these issues." *Id.*

In particular, the Specification discloses that the invention uses sequential game models and corresponding algorithms for drug design and/or treating a patient over time. *Id.* ¶ 5. The sequential game is associated with treatment of a medical condition. *Id.* ¶ 6. A model for the sequential game represents implementation of possible treatment actions (actions that a treater can take to treat the medical condition), and possible medical condition actions (actions that the medical condition can take). *Id.* Solving the model generates a treatment for the medical condition, where the treatment plan has a set of possible treatment actions. *Id.*

Consistent with this disclosure, claim 1 recites a system for developing a course of treatment for a medical condition that performs the following steps: "identify a description of a sequential game by receiving . . . information corresponding to a medical condition" (limitation (d)(1)); "identify a set of possible treatment actions that a treater can take to treat the medical condition, and a plurality of sequences for the actions" (limitation (d)(2)); "for each of the plurality of sequences, identify one or more possible medical condition actions that the medical condition can take in response to one or more of the possible treatment actions" (limitation (d)(3)); "identify a model for the sequential game, wherein" (limitation (d)(4)):

> the game is a large game associated with a large state space;
> the model represents implementation of the possible treatment actions as moves in the sequential game;
> the model represents the possible medical condition actions in one or more sequences; and
> the model includes information to predict an updated status based on an expected patient response to each of the possible treatment actions in the one or more sequences

(limitations (d)(4)(i)–(d)(4)(iv)); "solve the model by applying a game-solving algorithm to the model to generate a treatment plan for the medical condition, where the treatment plan comprises a set of possible treatment actions" (limitation (d)(5)); and "output a report of the treatment plan" (d)(6)). These limitations, when given their broadest reasonable interpretation, recite identifying various data that pertains to a model for a sequential game, wherein the model represents implementation of possible treatment actions for a medication condition as moves in a sequential game (limitations (d)(1)–(d)(4)(iv); solving the model to generate a treatment plan

by applying an algorithm to generate a treatment plan (limitation (d)(5)); and outputting the results of the treatment plan (limitation (d)(6)).

Although claim 1 recites that the steps are performed by "one or more processors," the underlying steps recited in the claim are all acts that, as the Examiner observes (*see* Final Act. 4), could be performed by a human mentally or manually, using pen and paper, without the use of a computer or any other machine. For example, a person or persons using pen and paper could identify a model, solve the model by applying a game-solving algorithm, and output a result. Simply put, claim 1 recites a mental process (including an observation (limitations (d)(4)(i)–(d)(4)(iv)), evaluation (limitation (d)(5)), and judgment or opinion (limitation (d)(6)), which is an abstract idea. *See* Revised Guidance, 84 Fed. Reg. at 52; *see also* Appeal Br. 11 (characterizing claim 1 as using game-solving processes to generate treatment plans for medical conditions); 13 (characterizing claim 1 as "focus[ing] on identifying a model for a sequential game and solving the model by applying a game-solving algorithm to the model").

The Federal Circuit has held similar concepts to be abstract. For example, the Federal Circuit has held that claims directed collecting data, analyzing the data, and reporting the results of the collection and analysis, including when limited to particular content, to be directed to excluded subject matter. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1340 (Fed. Cir. 2017) (identifying the abstract idea of collecting, displaying, and manipulating data); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) (characterizing collecting information, analyzing information by steps people go through in their minds, or by mathematical algorithms, and presenting the results of

collecting and analyzing information, without more, as matters within the realm of abstract ideas); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) (holding that method steps that can be performed in the human mind, or by a human using a pen and paper, are unpatentable mental processes).

Step One of the Mayo/Alice Framework (Revised Guidance, Step 2A, Prong Two)

Having concluded that claim 1 recites a judicial exception, i.e., an abstract idea (Step 2A, Prong One), we next consider whether the claim recites additional elements that integrate the judicial exception into a practical application (Step 2A, Prong Two). *See* Revised Guidance, 84 Fed. Reg. at 54.

Beyond the abstract idea, claim 1 additionally recites "one or more processors" (limitation (a)); "a user interface" (limitations (b), (d)(1)); "a communication port" (limitations (c), (d)(1)); and "a nontransitory, computer-readable memory comprising one or more programming instructions that, when executed cause one or more of the processors to [perform limitations (d)(1)–(d)(5)]" (limitation (d)). However, Appellant's Specification describes these elements at a high degree of generality, i.e., as generic computer components. *See, e.g.*, Spec. ¶¶ 19 (describing that "[a] 'processor' refer[s] to a computer or other machine that performs one or more operations according to one or more programming instructions"), 27 (describing that the invention could be used in a large game with a large state space), 81–85 (describing exemplary hardware at a high level). *See DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1256 (Fed. Cir. 2014) ("[A]fter *Alice*, there can remain no doubt: recitation of generic

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computer limitations does not make an otherwise ineligible claim patent-eligible.").

Appellant argues that claim 1 cannot be formed in the human mind alone or even with basic computer functionality because it requires "solv[ing] a complex, unique model" for a large, sequential game associated with a large state space. Appeal Br. 13 (citing Decl. 1–3); *see also id.* at 17 (claim 1 recites "steps that are more complex than the unaided human mind can perform on its own" (citing Decl. 3)). Appellant's Declaration asserts that the steps recited in claim 1 are "more complex than what the human mind can perform on its own." Decl. 1. Appellant's Declaration further asserts that the claimed game is a large game associated with a large state space, which requires significant computational capacity. *Id.* at 2; *see also id.* at 3 (describing with respect to dependent claim 16 that the inventor used powerful servers and supercomputers to computer a best response and cannot be done by hand, and describing with respect to dependent claim 21 that a Nash equilibrium technique would take a computer hours, days, or months to perform; whereas, it would take a human longer than a lifetime).

The difficulty with Appellant's argument, however, is that claim 1, under its broadest reasonable interpretation, does not recite a supercomputer or specialized computer. Instead, claim 1 recites "one or more processors" perform the recited steps. Appellant's Specification makes clear that the processor does not require any significant computational capacity. For example, the Specification defines a "processor" as "a computer or other machine that performs one or more operations according to one or more programming instructions." Spec. ¶ 19 (defining "processor" and "computing device" interchangeably). And the Specification identifies

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"desktop computers, laptop computer[s], electronic tablets, ultrabooks, smart phones, smart televisions, and similar electronic devices having processing and user interface capability" as exemplary processors for use with the invention. *Id.* The Specification does not identify a processor as including, much less requiring, a supercomputer or specialized computer.

Contrary to Appellant's assertions, claim 1 also does not require the performance of calculations so complex that they could not be practically performed by a human manually with pen and paper. Instead, claim 1 recites "identify[ing] a model for the sequential game," the game being "a large game associated with a large state space"; and "solv[ing] the model by applying a game-solving algorithm to the model to generate a treatment plan for the medical condition." These steps cover any way of performing the identifying and solving steps, such that they practically can be performed in the mind. *See, e.g.*, *Elec. Power Grp.*, 830 F.3d at 1356 (cautioning against claims "so result focused, so functional, as to effectively cover any solution to an identified problem); *SmartGene, Inc. v. Advanced Biological Laboratories*, SA, 555 F. App'x 950, 955 (Fed. Cir. 2014) (comparing new and stored information and using rules to identify medical options)(nonprecedential); *Intellectual Ventures I*, 850 F.3d at 1342 ("[T]he claim language here provides only a result-oriented solution with insufficient detail for how a computer accomplishes it. Our law demands more.").

For example, Appellant's Specification provides that "[a]ny now or hereafter known algorithm for solving a game model may be used" (Spec. ¶ 26), and that the "particular [game] model used may vary" (*id.* ¶ 25). The Specification identifies known game-solving algorithms for poker and checkers, as well as other games, as exemplary game-solving

algorithms. *Id.* These exemplary game-solving algorithms do not indicate that claim 1's step of solving is restricted to calculations so complex that they cannot practically be performed in the mind.

Claim 1 further recites that the game is large and associated with a large state space. However, a human could use paper and pen to account for limitations in the human's memory when solving a model of a large game associated with a large state space. Mental processes remain unpatentable even when automated to reduce the burden on the user of what once could have been done with pen and paper. *CyberSource Corp. v. Retail Decision, Inc.*, 654 F.3d 1366, 1375 (Fed Cir. 2011) ("[t]hat purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*[, 93 S. Ct. 253 (1972)]"); *see also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015) ("relying on a computer to perform routine tasks more quickly or more accurately is insufficient to render a claim patent eligible"); *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012) ("the fact that the required calculations could be performed more efficiently via a computer does not materially alter the patent eligibility of the claimed subject matter").

We do not find anything of record, short of attorney argument, that attributes an improvement in technology and/or a technical field to the claimed invention, or that otherwise indicates that the claimed invention integrates the abstract idea into a "practical application," as that phrase is used in the 2019 Revised Guidance.[3] For example, Appellant's

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[3] The Revised Guidance references MPEP § 2106.05(a)–(c) and (e) in describing the considerations that are indicative that an additional element or

Specification does not indicate that claim 1 addresses any particular medical condition, requires any particular type of model, requires any specialized computer, or is solved by applying any particular game-solving algorithm in any particular way. Instead, claim 1 focuses on improving a method to generate a treatment plan for a medical condition (Spec. ¶ 4) using a computers in its ordinary capacity, rather than improving the functionality of a computer, computer network, or other technology.

Appellant contends that the courts have stated that *particular applications* of mathematical applications of mathematical formulas to solve particular problems *can* be patented. Appeal Br. 17–18. But, here, claim 1 fails to recite any particular mathematical formula, any particular application, or any particular problem with sufficient technical detail to indicate an improvement in computer technology or other technology. Instead, claim 1 recites results-based-functional language without providing sufficient technological detail for how to achieve the desired, claimed results. For example, claim 1 recites "identify[ing] a model for the sequential game"; and "solv[ing] the model by applying a game-solving algorithm to the model to generate a treatment plan for the medical condition." But claim 1 does not specify *how* to identify the model, or *how* to solve the model by applying a game-solving algorithm.

Appellant does not identify, and we do not find, anything in the Specification to indicate that any of the claimed functions invokes any

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combination of elements integrates the judicial exception, e.g., the abstract idea, into a practical application. Revised Guidance, 84 Fed. Reg. at 55. If the recited judicial exception is integrated into a practical application, as determined under one or more of these MPEP sections, the claim is not "directed to" the judicial exception.

assertedly inventive programming or is implemented using other than generic computer components to perform generic computer functions. To the contrary, Appellant's Specification provides, for example, that "[a]ny now or hereafter known algorithm for solving a game model may be used" (Spec. ¶ 26), and that the "[t]he particular model [for a sequential game] used may vary" (*id.* ¶ 25). *See Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1342 (Fed. Cir. 2017) ("[T]he claim language here provides only a result-oriented solution with insufficient detail for how a computer accomplishes it. Our law demands more.").

Appellant argues that the pending claims are analogous to those held patent eligible in *DDR Holdings*. Appeal Br. 15–16; *see also* Reply Br. 6–7. Specifically, Appellant contends that the "solving of sequential game models," as recited in claim 1, is "necessarily rooted in computer technology," analogous to the claims at issue in *DDR Holdings*. Appeal Br. 16. Appellant also asserts that, like the claims in *DDR Holdings*, claim 1 "do[es] not recite an commercial practice known prior to the invention of computerized networks." *Id.*; *see also* Reply Br. 6–7 ("claims are directed to an unconventional and [sic] method of automated treatment plan generations [sic] that improves upon prior systems").

However, the court in *DDR Holdings* did not conclude that the claims were patent-eligible because they did not recite the performance of a commercial practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claims at issue in *DDR Holdings* changed the routine, conventional functioning of Internet hyperlink protocol to direct a user of a host website to a "store within a store" on the host website, rather than to an advertiser's third-party website,

when the user clicks an advertisement. *See DDR Holdings*, 773 F.3d at 1257–58. The court determined that the invention was "necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks," and that the claimed invention did not simply use the Internet to perform an abstract business practice with insignificant added activity. *Id.*

Here, Appellant contends that solving of sequential game models, as recited in claim 1, is necessarily rooted in computer technology. Appeal Br. 16; *see also id.* at 11 ("the combination [recited in claim 1] applies a unique technical solution (in particular, solving a model for [a] sequential game that is associated with a large state space to a technical problem (medical treatment)"). But solving a model by applying a game-solving algorithm to generate a treatment plan for a medical condition, as recited in claim 1, is not a solution that is necessarily rooted in computer technology, or even a problem unique to computers or computer networks. Instead, it is a concern in the health practice that existed before, and still exists outside, the realm of computers and the Internet. Appellant's invention seeks to improve known methods of generating treatment plans. *See, e.g.*, Spec. ¶ 4. But this improvement, at best, relates to applying the abstract idea in a particular technological environment (e.g., using a model for a sequential game) that uses computers in their ordinary capacity.

Appellant's reliance on *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1302 (Fed. Cir. 2016) is similarly misplaced. Appeal Br. 16–17. There, the Federal Circuit held the claim was patent eligible because the claim entails an unconventional technological solution (enhancing data in a distributed fashion) to a technological problem

(massive record flows which previously required massive databases). Although the solution requires generic components, the court determined that "the claim's enhancing limitation necessarily requires that these generic components operate in an unconventional manner to achieve an improvement in computer functionality" and that the "enhancing limitation depends not only upon the invention's distributed architecture, but also depends upon the network devices and gatherers — even though these may be generic — working together in a distributed manner." *Amdocs*, 841 F.3d at 1300–01.

Appellant argues that, similar to the claims in *Amdocs*, claim 1 "require[s] that the computer use a model for a sequential game in which the model represents (i) implementation of possible treatment actions as moves in the sequential game, and (ii) possible medical condition actions in one or more sequences." Appeal Br. 16–17. Appellant contends that claim 1 "require[s] that the computer operate in an unconventional manner to achieve an improvement in automated treatment plan development that was not previously considered or suggested." *Id.* at 17. But, we are not persuaded that using a model for a sequential game, as set forth in claim 1, is a technological process, technological improvement, or improvement to the operation of a computer system, rather than an improvement to an abstract idea.

We also are not persuaded of Examiner error by Appellant's argument regarding preemption. *See* Appeal Br. 19 ("Medical treatment plans may be created in an infinite number of ways without being precluded by these claims.") Although the Supreme Court has described "the concern that drives [the exclusion of abstract ideas from patent-eligible subject matter] as

one of pre-emption," *Alice Corp.*, 573 U.S. at 216, characterizing preemption as a driving concern for patent eligibility is not the same as characterizing preemption as the sole test for patent eligibility. "The Supreme Court has made clear that the principle of preemption is the basis for the judicial exceptions to patentability" and "[f]or this reason, questions on preemption are inherent in and resolved by the § 101 analysis.*" Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (citing *Alice Corp.*, 573 U.S. at 216). "[P]reemption may signal patent ineligible subject matter, [but] the absence of complete preemption does not demonstrate patent eligibility."

We conclude, for the reasons outlined above, that claim 1 recites a mental process, i.e., an abstract idea, and that the additional elements recited in the claim do no more than generally link the abstract idea to a particular technological environment (e.g., involving a model for a large, sequential game in a large state space). Therefore, the additional elements do not integrate the abstract idea into a practical application. Accordingly, we agree with the Examiner that claim 1 is directed to an abstract idea.

Step Two of the Mayo/Alice Framework (*2019 Revised Guidance*, *Step 2B*)

Having determined under step one of the *Mayo/Alice* framework that claim 1 is directed to an abstract idea, we next consider under Step 2B of the 2019 Revised Guidance, the second step of the *Mayo/Alice* framework, whether claim 1 includes additional elements or a combination of elements that provides an "inventive concept," i.e., whether the additional elements amount to "significantly more" than the judicial exception itself. 2019 Revised Guidance, 84 Fed. Reg. at 56.

As described above, claim 1 recites the following additional elements beyond the abstract idea: "one or more processors"; "a user interface"; "a communication port"; and "a nontransitory, computer-readable memory comprising one or more programming instructions that, when executed cause one or more of the processors to [perform limitations (d)(1)–(d)(5)]." However, Appellant's Specification describes these elements at a high degree of generality, i.e., as generic computer components. *See, e.g.*, Spec. ¶¶ 19 (describing that "[a] 'processor' refer[s] to a computer or other machine that performs one or more operations according to one or more programming instructions"), 81–85 (describing exemplary hardware at a high level).

Appellant contends that the claims recite the additional elements of identifying a model, and solving the model by applying a game-solving algorithm, which steps purportedly involve much more than using rules to generate a treatment plan and do not preempt other methods of creating medical plans. Appeal Br. 18. Yet, the limitations to which Appellant refers are part of the abstract idea itself, not additional elements to consider under step two of the *Mayo/Alice* framework. *See BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1290 (Fed. Cir. 2018) ("It has been clear since *Alice* that a claimed invention's use of the ineligible concept to which it is directed cannot supply the inventive concept that renders the invention "significantly more" than that ineligible concept); *see also Berkheimer v. HP Inc.*, 881 F.3d 1360, 1370 (Fed. Cir. 2018) (holding that claims lacked an inventive concept where they amount to no more than performing the abstract idea with conventional computer components) *cert. denied*, 2020 WL 129532 (U.S. Jan. 13, 2020).

Appellant attempts to draw an analogy between the present claims and those in *BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016). Appeal Br. 19. Yet, we can find no parallel between claim 1 and the claims at issue in *BASCOM*. There, the Federal Circuit determined that the claims were directed to a technology-based solution to filter Internet content that overcame existing problems with other Internet filtering systems by taking a known filtering solution — i.e., a "one-size-fits-all" filter at an Internet Service Provider ("ISP") — and making it more dynamic and efficient by providing individualized filtering at the ISP. *BASCOM*, 827 F.3d at 1351. The court, thus, held that the second step of the *Mayo/Alice* framework was satisfied because the claimed invention "represents a 'software-based invention[ ] that improve[s] the performance of the computer system itself.'" *Id.* (alterations in original).

Appellant argues that claim 1 requires identifying a model and solving the model by applying a game-solving algorithm, and require the game to be a large game associated with a large state space. Appeal Br. 19. Appellant contends that these elements "improve the functioning of a computer by requiring it to implement specific, complex processes." *Id.* at 19–20. But Appellant does not explain, and we do not see how, performing the claimed steps of identifying a model and solving the model improves the functioning of a computer itself. Instead, these limitations reflect an improvement to the abstract idea itself that uses generic computing components for implementation.

Appellant also misapprehends the controlling precedent to the extent that Appellant maintains that the claims are patent eligible, because they are not taught by the prior art. *See* Appeal Br. 19–20 ("Appellant knows of no

prior art closed-form formula for solving [the model]"). Neither a finding of novelty nor a non-obviousness determination automatically leads to the conclusion that the claimed subject matter is patent eligible. A novel and non-obvious claim directed to a purely abstract idea is, nonetheless, patent ineligible. *See Mayo*, 566 U.S. at 90.

Here, Appellant has not identified, and we do not find, any additional elements recited in claim 1 that, individually or in combination, provide significantly more than the abstract idea. We are not persuaded, on the present record, that the Examiner erred in rejecting independent claim 1 under 35 U.S.C. § 101. Therefore, we sustain the Examiner's rejection of claim 1, and claim 18, which fall with claim 1 under 35 U.S.C. § 101. We also sustain the rejection under 35 U.S.C. § 101 of claims 2, 3, 6–17, and 19–21, which are not separately argued.

With respect to dependent claim 4, Appellant additionally argues that claim 4 recites "solving the model by generating a treatment plan with one or more traps." With respect to dependent claim 5, Appellant similarly argues that claim 5 requires solving the model by applying an opponent model that looks ahead at most a set number of steps. Appellant contends that these additional limitations go beyond an abstract idea, and do not preclude all methods of generating medical condition treatment plans. Appeal Br. 20–21. However, like the limitations in claim 1 discussed above, the limitations of claims 4 and 5 also fail to recite a particular way of performing the desired functionality, and thus, are drawn to an abstract idea. *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1258–59 (Fed. Cir. 2016). Appellant's arguments regarding preemption are unpersuasive for the same reasons described above.

In the Reply Brief, Appellant argues for the first time that claim 8 is patent eligible because it requires a specific application of the treatment plan to take certain actions on the patient, analogous to the claims at issue in *Classen Immunotherapies Inc., v. Biogen IDEC*, 659 F.3d 1057 (Fed. Cir. 2011). Reply Br. 7. Appellant's argument is untimely, and is waived here in the absence of any showing of good cause why the argument could not have been timely presented in Appellant's Appeal Brief. *See* 37 C.F.R. § 41.41(b)(2); *see also In re Hyatt*, 211 F.3d 1367, 1373 (Fed. Cir. 2000) (noting that an argument not first raised in the brief to the Board is waived on appeal); *Ex parte Nakashima*, 93 USPQ2d 1834, 1837 (BPAI 2010) (informative) (explaining that arguments and evidence not timely presented in the Principal Brief, will not be considered when filed in a Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the Principal Brief); *Ex parte Borden*, 93 USPQ2d 1473, 1477 (BPAI 2010) (informative) ("Properly interpreted, the Rules do not require the Board to take up a belated argument that has not been addressed by the Examiner, absent a showing of good cause.").

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–21	101	Eligibility	1–21	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED