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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte HA-YOUNG KIM, KYOUNG-GU WOO, and
JI-HYUN LEE¹

Appeal 2018-002473
Application 13/488,586
Technology Center 1600

Before RICHARD M. LEOVITZ, JEFFREY N. FREDMAN, and
TAWEN CHANG, *Administrative Patent Judges*.

CHANG, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) involving claims to a diagnostic factor set determination apparatus used to predict the occurrence of a disease or assess the severity of an ongoing disease, which have been rejected as directed to a judicial exception without more, failing to comply with the written description requirement, and indefinite. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellants identify the Real Party in Interest as Samsung Electronics Co., Ltd. (Appeal Br. 5.)

STATEMENT OF THE CASE

The Specification states that “[d]iagnostic factors included in personal examination data may vary depending on the situation in which a patient is examined, the hospital in which the patient examination is conducted, and the area or country in which the patient examination is conducted.” (Spec. ¶ 3.) According to the Specification, if disease diagnosis were made based on a disease model without taking into consideration diagnostic factors from personal examination data not included in the disease model, prediction of the occurrence or severity of the disease may not be accurate. (*Id.* ¶ 4.) The invention relates to an apparatus for determining “a diagnostic factor set” for a disease according to a sum of “disease weights” of a plurality of diagnostic factors that is in the personal examination data but not in the selected disease model, wherein a disease weight refers to “an influence of a diagnostic factor on [the] target disease.” (*Id.* ¶¶ 5, 44.)

Claims 1, 3–11, 13, 14, 17–23, and 25 are on appeal. Claim 1 is illustrative and reproduced below:

1. A diagnostic factor set determination apparatus used to predict the occurrence of a disease or assess a severity of an ongoing disease, comprising:
 - a non-transitory computer readable memory configured to store instructions; and
 - one or more processors configured to execute the instructions to[]acquire personal examination data comprising diagnostic factors including a blood pressure, a cholesterol level, and a body weight through a user interface without attachment to a body and transmitting the personal examination data wirelessly to the one or more processors;
 - select a disease model from a disease model database, the selected disease model comprising more of the diagnostic factors that are included in the personal examination

data compared to other disease models from the disease model database;

determine a diagnostic factor set according to a sum of disease weights of a first group of the diagnostic factors that are included in the personal examination data and not in the selected disease model in order to fully reflect the diagnostic factors of the acquired personal examination data in a disease diagnosis, compare a first threshold value with the sum of the disease weights of the first group of the diagnostic factors and compare a second threshold value with the sum of the disease weights of the first group of the diagnostic factors; and

determine the diagnostic factors included in both the personal examination data and the selected disease model to be diagnostic factors of a new disease model in response to the sum of the disease weights of the first group being equal to or greater than the first threshold value, and determine a diagnostic factor in the first group that is more related to the target disease compared to other diagnostic factors in the first group to be a diagnostic factor in response to the sum of the disease weights of the first group being less than the second threshold value,

wherein the one or more processors create the new disease model using a determined diagnostic factor set, and register the new disease model in the disease model database, and store the new disease model in the non-transitory computer readable memory.

(Appeal Br. 35 (Claims App.).)

The Examiner rejects claims 1, 3–11, 13, 14, 17–23, and 25 under 35 U.S.C. § 101 as being directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without including additional elements that are sufficient to amount to significantly more than the judicial exception itself. (Ans. 2.)

The Examiner rejects claims 1, 3–11, 13, 14, 17–23, and 25 under 35 U.S.C. § 112(a) or pre-AIA 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. (Ans. 4.)

The Examiner rejects claims 1, 3–11, 13, 14, 17–23, and 25 under 35 U.S.C. § 112(b) or pre-AIA 35 U.S.C. § 112, second paragraph, as being indefinite. (Ans. 6.)

I.

Issue

The Examiner rejects claims 1, 3–11, 13, 14, 17–23, and 25 as being directed to an abstract idea without significantly more. The Examiner finds that the claims “present essentially a method that employs the algorithmic processing of existing information (personal examination data) in order to generate additional information.” (Ans. 3.) The Examiner further finds that, other than the abstract idea, the claims are limited only by “the use of conventional and generic computer implementation means” and thus do not recite significantly more than the abstract idea itself. (*Id.*)

Appellants contend that the claims are not directed to an abstract idea and, in any event, recite significantly more than the alleged abstract idea. (Appeal Br. 13–27.)

Appellants have not separately argued the claims.² We therefore limit our analysis to claim 1 as representative. The issue with respect to this

² Notwithstanding the generic statement in the briefs that “[e]ach of the claims is being argued separately under a separate subheading . . . and thus . . . stands or falls alone” (Appeal Br. 13), Appellants’ only argument with respect to independent claim 17 is that “claim 17 is allowable for the same reasons stated . . . for independent claim 1.” (Appeal Br. 31–32.) Likewise, Appellants’ only argument for each dependent claim is the dependent claim is patentable “at least for the reasons independent claim [1 or 17] is patentable, and further, because it recites additional limitations.” (*Id.* at 29–33.) This does not suffice as separate argument of the claims. *Cf. In re Lovin*, 652 F.3d 1349, 1357 (Fed. Cir. 2011) (“[T]he Board [has] reasonably interpreted Rule 41.37 to require more substantive arguments in an appeal

rejection is whether claim 1 is directed to an abstract idea without significantly more.

Analysis

We analyze this case under the framework set forth by the Supreme Court in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012), and applied by our reviewing court in *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015). As the *Ariosa* court explained:

In *Mayo* . . . , the Supreme Court set forth a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts. First, we determine whether the claims at issue are directed to a patent-ineligible concept. . . . If the answer is yes, then we next consider the elements of each claim both individually and “as an ordered combination” to determine whether additional elements “transform the nature of the claim” into a patent-eligible application. . . . The Supreme Court has described the second step of this analysis as 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 1375.

Mayo Step One: Whether Claim 1 Is Directed to Abstract Idea

We begin with the first step of the *Mayo* test, namely whether a claim is “directed to” a patent-ineligible concept. On January 7, 2019, the Director

brief than a mere recitation of the claim elements and a naked assertion that the corresponding elements were not found in the prior art.”).

of the USPTO issued the “2019 Revised Patent Subject Matter Eligibility Guidance” (“Revised Guidance”), which provides further details regarding how the Patent Office analyzes patent-eligibility questions under 35 U.S.C. § 101. Revised Guidance, 84 Fed. Reg. 50–57 (Jan. 7, 2019). Under the Revised Guidance, the first step of the *Mayo* test (i.e., Step 2A of the Revised Guidance) is “a two-pronged inquiry.” *Id.* at 54. In prong one, we evaluate whether the claim recites a judicial exception, such as laws of nature, natural phenomena, or abstract ideas. *Id.* The Revised Guidance explains that

the abstract idea exception includes the following groupings of subject matter, when recited as such in a claim limitation(s) (that is, when recited on their own or per se):

(a) Mathematical concepts—mathematical relationships, mathematical formulas or equations, mathematical calculations;

(b) Certain methods of organizing human activity—fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions); and

(c) Mental processes—concepts performed in the human mind (including an observation, evaluation, judgment, opinion).

Id. at 52 (footnotes omitted). If the claim recites a judicial exception, the claim is further analyzed under prong two, which requires “evaluat[ion of] whether the claim recites additional elements that integrate the exception into a practical application of that exception.”

First Prong of Revised Guidance Step 2A

With respect to the first prong of Step 2A of the Revised Guidance, we agree with the Examiner that claim 1 recites a patent-ineligible abstract idea. In particular, claim 1 recites a processor configured to perform steps of (1) “select[ing] a disease model . . . comprising more of the diagnostic factors that are included in the personal examination data compared to other . . . models from the . . . database,” (2) “determin[ing] . . . a sum of disease weights of . . . factors that are included in the personal examination data [but] not in the selected disease model,” (3) “compar[ing] a first threshold value with the sum of the disease weights” and “a second threshold value with the sum of the disease weights,” (4) “determin[ing] . . . the diagnostic factors of a new disease model in response to the sum of the disease weights . . . being equal to or greater than the first threshold value” and/or “being less than the second threshold value,” and (5) “creat[ing] a new disease model using a determined diagnostic factor set.” (Appeal Br. 35 (Claims App.)) All of these steps, however, are mental processes, i.e., concepts that may be performed in the human mind. *See* Revised Guidance, 84 Fed. Reg. at 52. Indeed, all of these diagnostic steps are mental processes similar to those routinely performed by a physician improving patient diagnoses, including acquiring personal examination data of patients, analyzing the data using diagnostic models obtained through expert experience, balancing the diagnostic factors to determine an accurate diagnosis, and remembering the interplay of the factors for diagnoses of later patients. *See, e.g., In re Meyer*, 688 F.2d 789, 793 (CCPA 1982). Such mental processes are not patentable. *Mayo*, 566 U.S. at 71.

Second Prong of Revised Guidance Step 2A

The second prong of Step 2A asks whether the claims as a whole integrates the judicial exception into a practical application of the exception. Revised Guidance, 84 Fed. Reg. at 54. We find that claim 1 does not recite additional elements that integrate the recited abstract idea into a practical application of the idea. The only elements of claim 1 that are not mental processes are “a non-transitory computer readable memory configured to store instructions”; “one or more processors”; “a user interface without attachment to a body”; “a disease model database”; and the steps of acquiring personal examination data, transmitting such data wirelessly to other processors, registering a new disease model, and storing the new disease model in computer memory.

As for the limitations relating to memory, processors, user interface, and database, these elements merely implement on a computer the abstract idea of determining a diagnostic factor set for a target disease based on personal examination data and existing disease models. (Appeal Br. 35 (Claims App.)) As explained in the Revised Guidance, a judicial exception has not been integrated into a practical application if the additional elements of the claim “merely includes instructions to implement an abstract idea on a computer, or merely uses a computer as a tool to perform an abstract idea.” Revised Guidance, 84 Fed. Reg. at 55. In a case with claims to “an ineligible discovery, together with “well-known techniques to execute the claimed method,” [the Federal Circuit] held that the claims were directed to a natural law” and therefore ineligible. *Athena Diagnostics, Inc. v. Mayo Collaborative Services, LLC*, 915 F.3d 743, 751 (Fed. Cir. 2019). Similarly,

acquiring personal examination data and transmitting the data to processors (i.e., collecting information for analysis), and registering a new disease model and storing the model in computer memory (i.e., presenting the results of the analysis), are insignificant extra-solution activities that do not integrate a judicial exception into a practical application. That is, the use of computers alone in a diagnostic method is not sufficient to impose a meaningful limit on the judicial exception. Revised Guidance, 84 Fed. Reg. at 55 (explaining that “insignificant extra-solution activity” does not integrate judicial exception into practical application); *see also Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–1354 (Fed. Cir. 2016) (stating that “collecting information, including when limited to particular content . . . , [is] within the realm of abstract ideas” and further stating that “merely presenting the results of abstract processes of collecting and analyzing information, without more . . . , is abstract as an ancillary part of such collection and analysis”).

Mayo Step Two: Whether Claim 1 Recites “Significantly More”

Having determined that claim 1 is directed to a patent-ineligible abstract idea, we next consider the second step of the *Mayo* test, namely whether claim 1 recites “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.’” *Ariosa*, 788 F.3d at 1375 (citation omitted). We find that it does not: As discussed above, the only elements of claim 1 other than the abstract ideas themselves are generic computer components (i.e., memory, processor, user interface, and database) and/or functionalities (i.e., receiving, sending, processing, and storing data).

These elements whether considered individually or in combination do not add significantly more to the abstract ideas recited in claim 1 (i.e., the steps for determining the diagnostic factors to be included in a new disease model, which are mental processes).

Appellants' Arguments

Appellants first contend that the claims are not directed to abstract ideas because “no courts have found ‘a diagnostic factor set determination apparatus used to predict the occurrence of a disease or assess a severity of an ongoing disease’ to be an abstract idea.” (Appeal Br. 14–15.) We are not persuaded because Appellants read the relevant case law too narrowly.³ As discussed above, the claims are directed to mental processes, i.e., “steps that can be performed in the human mind, or by a human using a pen and paper,” which courts have held to be unpatentable. *See, e.g., CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371–1373 (Fed. Cir. 2011). Thus, claims directed to such mental processes are not patentable, even if the *specific* mental process claimed has not been the subject of a court decision.

Appellants also contend that the claims on appeal are distinguishable from *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014), which the Examiner cites for support and which found claims directed to “device profiles” to be patent-ineligible, because the claims on appeal are “directed to a tangible, physical diagnostic factor set determination apparatus” and “creat[es] a new entity (i.e., a new

³ We also note that *Bilski* characterized the ineligible method in *Meyer* as “a computerized method for aiding a neurologist in diagnosing patients.” *Bilski*, 545 F.3d at 1001 (citing *Meyer*, 688 F.2d at 789).

disease model).” (Appeal Br. 15; *see also id.* at 16 (“Applicants are reciting a[n] . . . apparatus . . . that generates new entities (i.e., a disease model).”))

We are not persuaded. While it is true that in *Digitech* the claimed device profile was not expressly tied to a physical apparatus such as an image processor, *Digitech*, 758 F.3d at 1349, 1351, recitation of a machine in a claim does not necessarily mean that a recited abstract idea is integrated into a practical application or that the claims are patent eligible. Instead, the Federal Circuit has explained that “the use of a specific machine . . . must impose meaningful limits on the claim’s scope” and not be “insignificant extra-solution activity” in order to impart patent-eligibility. *In re Bilski*, 545 F.3d at 961–962. *See also* Revised Guidance, 84 Fed. Reg. at 55 (explaining that additional element that merely use computer as tool to perform abstract idea or only adds insignificant extra-solution activity to abstract idea does not integrate abstract idea in practical application). As discussed above, the additional elements in the claims on appeal that recite tangible, physical apparatus merely implement an abstract idea on a computer and do not impose meaningful limits on the scope of the claims.

Likewise, we are not persuaded by Appellants’ attempt to distinguish *Digitech* by arguing that the claims on appeal “creat[es] a new entity (i.e., a new disease model).” Certain of the claims at issue in *Digitech* also creates a new entity, i.e., a device profile. *Digitech*, 758 F.3d at 1350–1351 (method claims on appeal “describes [a] process for generating [a] device profile”). Nevertheless, the *Digitech* court found that these claims are not patent eligible because the process of generating the device profile merely involves “taking existing information . . . and organizing . . . this information into a new form.” *Id.* at 1351. The new disease model recited in the claims

on appeal similarly results from the organization of existing information (i.e., personal examination data and a disease model) into a new form because the diagnostic factor set for the new disease model merely comprises diagnostic factors selected from the personal examination data and the selected existing disease model.

Appellants next contend that the claims on appeal are not directed to an abstract idea because they are “directed to a specific computer rather than a generic (general purpose) computer.” (Appeal Br. 20.) In particular, Appellants contend that the claims recite “a diagnostic factor set determination apparatus using specialized processors with real-world applications in disease diagnosis that . . . ameliorates the functions of the computer hardware that it is tied to.” (Appeal Br. 16; *see also id.* at 20.)

We are not persuaded. As discussed above, none of the hardware recited in the claim — e.g., computer readable memory, processors, and user interface — are specialized. In fact, the Specification explicitly states that the invention may be implemented using general purpose computers:

The units described herein may be implemented using hardware components and software components, such as microphones, amplifiers, band-pass filters, audio to digital convertors, and processing devices. A processing device may be implemented using *one or more general-purpose or special purpose computers*, such as, for example, a processor, a controller and an arithmetic logic unit, a digital signal processor, a microcomputer, a field programmable array, a programmable logic unit, a microprocessor or any other device capable of responding to and executing instructions in a defined manner.

(Spec. ¶ 87 (emphasis added).)

Instead, the gravamen of Appellants’ argument appears to be that the claims require a general purpose computer to execute the specific recited

instructions, which renders the computer a “specialized” processor. For instance, Appellants cite MPEP § 2181 for the proposition that “when the disclosed structure is a computer programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather that special purpose computer programmed to perform the disclosed algorithm.” (Appeal Br. 20 (internal quotation marks omitted).)

We are not persuaded. MPEP § 2181 relates to means-plus-function claims and thus has limited if any relevance to the determination of whether a claim recites more than implementation of an abstract idea on a generic computer. In contrast, courts have consistently held that, in a § 101 analysis, mere use of a computer as a tool to execute instructions that are no more than abstract ideas, i.e., what Appellants refer to as a “specific” computer, does not confer patent eligibility on an otherwise ineligible claim. *Credit Acceptance Corp. v. Westlake Servs.*, 859 F.3d 1044, 1055 (Fed. Cir. 2017) (explaining that Federal Circuit cases “have made clear that mere automation of manual processes using generic computers does not constitute a patentable improvement in computer technology” because in such cases “the focus of the claims is not on . . . an improvement in computers as tools . . . but on . . . independently abstract ideas that use computer as tools”) (internal quotation marks and citations omitted); *see also* Revised Guidance, 84 Fed. Reg. at 55.

Appellants contend the claims are not directed to an abstract idea because “the claimed solution is necessarily rooted in computer technology” and that the claims recite “an innovation in computer technology, namely creating a new disease model, which in this case reflects an improvement in the functioning of the computer itself,[] i.e.,[] in enhanced capabilities of the

computer.” (Appeal Br. 19.) In the same vein, Appellants contend that the claims on appeal are similar to the claims found to be patentable in *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016), in that the Specification “disparages conventional methods of disease diagnosis” and the claims “recite a specific type of data structure designed to improve the way a computer retrieves, processes, and stores data in memory” and are “an innovation in computer technology itself.” (Appeal Br. 17, 19–20.)

We are not persuaded for reasons similar to those already discussed: Other than generic computer components and functionality (e.g., memory, processors, database, and sending, receiving, and storing data), the limitations in claim 1 may all be performed in the human mind and are thus not “necessarily rooted in computer technology.”

Appellants’ citation to *Enfish* is similarly inapposite. The claims in *Enfish* were directed towards a self-referential database, which is “an innovative logical model for a computer database” in comparison to the relational database that is standard at the time. *Enfish*, 822 F.3d at 1330. Thus, the claims in *Enfish* recited “a specific improvement to the way computers operate.” *Id.* at 1336. In contrast, the alleged invention is not directed to a particular data *structure* or other improvement to the computer; rather, the alleged invention relates to the *data* that is stored in the data structure and the computer is “invoked merely as a tool.” *Id.*

As to Appellants’ contention that the claims relate to a novel and superior method of disease diagnosis, we note that an abstract idea is not patent eligible even if it is unknown and superior to conventional methods at the time of the invention. *Parker v. Flook*, 437 U.S. 584, 594–595 (1978)

(holding claim directed to “new and presumably better method for calculating alarm limit” to be patent ineligible).

Appellants further contend that the claims are directed to “a specific implementation of a solution to a problem,” have “real-world applications in disease diagnosis,” and “do not simply recite . . . ‘generalized steps performed on a computer using conventional computer activity.’” (Appeal Br. 16, 17; *see also id.* at 19 (arguing that “the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of disease diagnosis”).)

We are not persuaded. We have already explained above why the claims are directed to mental processes performed on a computer using conventional computer activity such as sending, receiving, processing, and storing data. While it is true that the claims on appeal are limited to the field of disease diagnosis, claims directed to abstract ideas do not become patent eligible merely because they link the idea to a particular technological environment or field of use. *Cf. Diamond v. Diehr*, 450 U.S. 175, 191 (1981) (explaining that “[a] mathematical formula as such is not accorded the protection of our patent laws . . . , and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment”); *see also Credit Acceptance Corp.*, 859 F.3d at 1047 (claim directed to abstract idea not patent eligible even though claim are limited to “real-world applications” relating to consumer financing).

Finally, Appellants contend that the claims on appeal are similar to those found patent eligible in *McRO, Inc. v. Bandai Namco Games America, Inc.*, 837 F.3d 1299 (Fed. Cir. 2016), because the “features of the present claims recite specific computer-implemented rules that improve an

underlying technological process (i.e. disease diagnosis)” and because disease diagnosis performed by a human, like animation performed by humans in *McRO*, “would . . . be based on merely subjective determinations, rather than using the particularly claimed rules.” (Appeal Br. 18.)

We are not persuaded. The claims in *McRO* relate to “automating part of a preexisting 3-D animation method. *McRO*, 837 F.3d at 1303. In that case, the Federal Circuit found the claims to be directed to patent eligible subject matter in part because “the automation goes beyond merely ‘organizing [existing] information into a new form’ but rather “uses a combined order of specific rules that renders information into a specific format that is then used to create desired results: a sequence of synchronized, animated characters.” *Id.* at 1315 (internal quotation marks omitted). In this case, as discussed above, the recited processor instructions do no more than organize existing information (i.e., personal examination data and existing disease model) into a new form.

Appellants contend that, even assuming claim 1 is directed to an abstract idea, the Examiner “fails to explain why other elements of the claims are not ‘significantly more’ than an abstract idea.” (Appeal Br. 20, 21.) We are not persuaded. The Examiner explained that “the claimed system is simply an application of the non-statutory, abstract method . . . , limited only [by] the use of conventional and generic computer implementation means.” (Ans. 3.) “Conventional and generic computer implementation means” do not add significantly more to the abstract idea. *Credit Acceptance Corp.*, 859 F.3d at 1056 (explaining that “[t]he use and arrangement of conventional and generic computer components . . . —such

as a database, user terminal, and server—do not transform the claim, as a whole, into ‘significantly more’ than a claim to the abstract idea itself”).

Appellants contend that the additional elements of the claim are in fact significantly more than an abstract idea because they “offer improvements to [a] technology/technical field, offer improvements to the functioning of the computer itself, [and] apply the judicial exception with, or by use of, a particular machine.” (Appeal Br. 20) Appellants likewise contend that the claims on appeal recite significantly more than “an algorithmic process[ing] of existing information in order to generate additional information.” (Appeal Br. 21.) We are not persuaded for all the reasons already discussed above.

Appellants contend that the claims on appeal are similar to *DDR Holdings v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014), *SiRF Tech. Inc. v. Int’l Trade Comm.*, 601 F.3d 1319 (Fed. Cir. 2010), *Research Corp. Technologies v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), and *Diamond v. Diehr*, 450 U.S. 175 (1981), because the claims require “use of a specialized processor and other physical components” and result in “a novel manipulation or transformation.” (Appeal Br. 21–26.)

We are not persuaded. As an initial matter and as discussed above, we find that claim 1 does not require use of specialized processors and only recites generic computer components. Moreover, even if claim 1 involved the use of a particular machine or the transformation of an article, the Federal Circuit has explained that “the use of a specific machine or transformation of an article must impose meaningful limits on the claim’s scope to impart patent-eligibility,” and “the involvement of the machine or transformation in the claimed process must not be insignificant extra-

solution activity.” *In re Bilski*, 545 F.3d at 961–962. Thus, for the reason discussed above, claim 1 would not be patent eligible even if Appellants can identify some involvement of a machine or some transformation in the claim.

We also disagree that the claims on appeal are similar in relevant respects to the claims found patent eligible in *DDR Holdings, SiRF Tech. Inc., Research Corp. Technologies*, or *Diehr*. The claims in *DDR Holdings* relate to an e-commerce system that generates a composite web page retaining a host website’s “look and feel” but display content from a third party (e.g., a third party product information) when a user clicks on a hyperlink on a host website (e.g., a third-party merchant advertisement). Thus, the claims are “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks,” namely the “challenge of retaining control over the attention of the customer” in view of the “ephemeral nature of an Internet ‘location’ [and] the near-instantaneous transport between these locations made possible by standard Internet communication protocols.” *DDR Holdings*, 773 F.3d at 1257–1258. In contrast, the “problem” of determining a diagnostic factor set for a target disease is not specific to the realm of computer networks and may be solved generally in the same way whether or not done by a computer or by a human being. Unlike in *DDR Holdings*, therefore, the computer in claim 1 is merely used as a tool to perform an abstract idea.

Similarly, the Federal Circuit in *SiRF Tech.* found that “the methods at issue could not be performed without the use of a GPS receiver,” because the claims were directed to calculating the absolute position of a GPS receiver, using data (i.e., pseudoranges, or distances or estimated distances

between satellites and a GPS receiver) that “can exist only with respect to a *particular* GPS receiver that receives the satellite signals.” *SiRF Tech.*, 601 F.3d at 1332. The Federal Circuit further found that is no evidence that the calculations recited in the claims “can be performed entirely in the human mind.” *Id.* at 1333. This is not the situation with respect to claim 1. Personal examination data, disease models, and diagnostic factor sets all may exist independent of the user interface, processor, memory, and database recited in claim 1, and, as already discussed above, the steps recited in claim 1 is capable of being performed entirely in the human mind.

Research Corp. and *Diehr* are likewise inapposite here. The Federal Circuit has explained that “the claimed processes in *Research Corp.* plainly represented improvements to computer technologies in the marketplace” and that the method claimed therein, “which required the manipulation of computer data structures (the pixels of a digital image and the mask) and the output of a modified computer data structure (the halftoned image), was dependent upon the computer components required to perform it.” *Bancorp Servs. L.L.C. v. Sun Life Assur. Co. of Canada*, 687 F.3d 1266, 1279 (Fed. Cir. 2012). As we have explained, in the instant case the recited computer merely “permits one to [determine a diagnostic factor set for a disease] more efficiently than one could mentally.” *Id.* “Using a computer to accelerate an ineligible mental process does not make that process patent eligible.” *Id.*

Diehr involves claims to a method of manufacturing “precision molded articles from selected synthetic rubber compounds.” *Diehr*, 450 U.S. at 179, fn. 5. Unlike the instant claim, therefore, the claim in *Diehr* integrates the judicial exception recited in its claims (a mathematical formula) into a practical application. *Id.* at 187 (stating that “an *application*

of a law of nature or mathematical formula to a known structure or process may deserv[e] . . . patent protection”); *see also id.* 84 Fed. Reg. at 55.

Appellants contend that the claims on appeal are distinguishable from *Gottschalk v. Benson*, 409 U.S. 63 (1972), *Parker v. Flook*, 437 U.S. 584 (1978), *Bilski v. Kappos*, 561 U.S. 593 (2010), and *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208 (2014), because the claims are not “directed to known or general mathematical formulas or algorithms” but are rather “directed towards a tangible improvement in disease diagnosis.” (Appeal Br. 26.) We are not persuaded. While claim 1 may not be directed to a mathematical formula or algorithm, it is directed to a mental process, which courts have consistently held to be an abstract idea. *See, e.g., Mayo*, 566 U.S. at 71. Furthermore, assuming for argument’s sake that the abstract idea allows for superior disease diagnosis, we have already noted that an abstract idea is not patent eligible even if it is superior to conventional methods. *Flook*, 437 U.S. at 594–595.

Finally, Appellants contend that claim 1 is not patent ineligible because it does not preempt the use of the recited steps in all fields, “but only as the steps relate to an improvement of disease diagnosis.” (Appeal Br. 26–27.) We are not persuaded. “While preemption may signal patent ineligible subject matter,” the Federal Circuit has explained that “the absence of complete preemption does not demonstrate patent eligibility.” *Ariosa*, 788 F.3d at 1379. Instead, “[w]here a patent’s claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework, . . . preemption concerns are fully addressed and made moot.” *Id.*; *see also Flook*, 437 U.S. at 586 (holding claims directed to

mathematical formula to be invalid even though claims “do not . . . cover every conceivable application of the formula”).

Accordingly, we affirm the Examiner’s rejection of claim 1 as directed to a patent-ineligible abstract idea without significantly more. Claims 3–11, 13, 14, 17–23, and 25, which are not separately argued, fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).⁴

II.

Issue

The Examiner has rejected claims 1, 3–11, 13, 14, 17–23, and 25 as failing to comply with the written description requirement. The Examiner rejects claims 1, 3–11, 13, 14, 17–23, and 25 under 35 U.S.C. § 112(b) or pre-AIA 35 U.S.C. § 112, second paragraph, as being indefinite. (Ans. 6.) The same issue is dispositive for both rejections; we therefore discuss them together.

⁴ Appellants’ Reply Brief, submitted on January 2, 2018, largely repeats arguments already made in the Appeal Brief; these arguments are not persuasive for the reasons already discussed. To the extent Appellants makes new arguments, *see, e.g.*, Reply Br. 9–12, 14–16 (discussing *Thales Visionix Inc. v. United States*, 850 F.3d 1343 (Fed. Cir. 2017), *BASCOM Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016), and *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2018)), Appellants have not persuasively explained why these arguments could not have been raised in the Appeal Brief. Thus, we find that the arguments have been waived. *See Ex parte Nakashima*, 93 USPQ2d 1834 (BPA1 2010) (informative) (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 (BPA1 2010) (informative) (explaining that “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”).

The Examiner concludes that the claims recite “functionally defined ‘nonce’ terms” and thus contain means plus function language. (Ans. 5.) Citing *Biomedino, LLC v. Waters Technology Corp.*, 490 F.3d 946 (Fed. Cir. 2007), the Examiner finds that the Specification is inadequate because it “only reiterates functional language that is correlated to a generic means as recited in the . . . claims” and “fails to specify any structure corresponding to the means.” (*Id.* at 5–6.) For the same reasons – i.e., that “there is no corresponding disclosure of what structures are encompassed by [the functionally defined] means [in the claims]” – the Examiner also finds the claims to be indefinite.

Appellants contend that defining processors in functional terms “does not make the processors fail to meet the written description requirement.” (Appeal Br. 27.) Appellants contend that the Examiner has not explained why the claims are indefinite “from the perspective of one of ordinary skill in the art.” (*Id.* at 28.) Appellants further contend that neither the written description nor the indefiniteness rejection is applicable to the claims because the claims do not contain means-plus-function elements and/or because the claims recite processors as hardware. (Appeal Br. 27–29.)

The issue with respect to this rejection is whether the claims contain means-plus-function limitations and, if so, whether the Specification discloses structures that correspond to the means for performing the claimed functions.

Analysis

We find that the Examiner has not established a prima facie case that the claims fail to comply with the written description requirement or are indefinite.

The claims on appeal are computer-implemented claims, and we agree with the Examiner that in such cases “simply disclosing a computer as the structure designated to perform a particular function” is insufficient to satisfy the requirements of section 112, paragraph 6. However, “structure” in computer-implemented claims need not be hardware but may consist of an algorithm for performing a recited function. *Aristocrat Technologies Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). The Federal Circuit has explained that “‘algorithm’ in computer systems has broad meaning” and “encompasses ‘in essence a series of instructions for the computer to follow,’” or “‘a step-by-step procedure for accomplishing a given result.’” *Typhoon Touch Technologies, Inc. v. Dell, Inc.*, 659 F.3d 1376, 1384 (Fed. Cir. 2011). The Federal Circuit has also explained that an algorithm may be expressed “‘in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure,’” and that “the patent need only disclose sufficient structure for a person of skill in the field to provide an operative software program for the specified function.” *Id.* at 1385.

The Examiner appears to assert that all of the instructions recited in the claims – e.g., acquiring personal examination data, transmitting said data to processors, selecting disease model from a database based on the overlap between the disease model and personal examination data, determining a diagnostic factor set for a new disease model by comparing the sum of disease weights of certain diagnostic factors to a threshold value – are merely functions for which corresponding structures must be provided in the Specification. (Ans. 5 (“The claims . . . recite generalized computer embodiments encompassed by generic ‘processor configured to . . . ’”

produce whatever functions/effects the claims describe.”) The Examiner does not explain, however, why these recited instructions and similar instructions disclosed in the Specification (*see, e.g.*, Spec. Fig. 6 and accompanying text) do not constitute an algorithm for determining the diagnostic factor set, i.e., a step-by-step procedure for determining the diagnostic factor set for a disease that would allow a skilled artisan to provide an operative software program for determining a diagnostic factor set.

Accordingly, because we find that the Examiner has not established a *prima facie* case that the Specification or the claims fail to provide corresponding structures for a means-plus-function limitation, we reverse the Examiner’s rejection of claims 1, 3–11, 13, 14, 17–23, and 25 as lacking in written description and indefinite.

SUMMARY

For the reasons above, we affirm the Examiner’s rejection of claims 1, 3–11, 13, 14, 17–23, and 25 as directed to a patent-ineligible abstract idea without significantly more. We reverse the Examiner’s rejection of claims 1, 3–11, 13, 14, 17–23, and 25 as lacking in written description and/or indefinite.

TIME PERIOD FOR RESPONSE

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

AFFIRMED