

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GAIN CAPITAL HOLDINGS, INC.,
Petitioner,

v.

OANDA CORPORATION,
Patent Owner.

CBM2020-00023
Patent 7,496,534 B2

Before SALLY C. MEDLEY, JUSTIN T. ARBES, and
SUSAN L. C. MITCHELL, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Amend
35 U.S.C. § 328(a)

I. INTRODUCTION

A. *Background and Summary*

Petitioner GAIN Capital Holdings, Inc. filed a Petition (Paper 2, "Pet.") requesting a covered business method ("CBM") patent review of claims 1–12 of U.S. Patent No. 7,496,534 B2 (Ex. 1001, "the '534 patent") pursuant to 35 U.S.C. § 321(a). Patent Owner OANDA Corporation filed a

Preliminary Response (Paper 8) pursuant to 35 U.S.C. § 323. On March 18, 2021, we instituted a covered business method patent review of the sole challenge raised in the Petition. Paper 10 (“Decision on Institution” or “Dec. on Inst.”). Patent Owner subsequently filed a Patent Owner Response (Paper 16, “PO Resp.”), and Petitioner filed a Reply (Paper 18, “Reply”). Patent Owner did not file a Sur-Reply.

Patent Owner also filed a Motion to Amend (Paper 17) and requested that we provide preliminary guidance concerning the Motion in accordance with the Board’s pilot program concerning motion to amend practice and procedures. Petitioner filed an Opposition (Paper 19). We issued Preliminary Guidance (Paper 20) determining, based on the record at the time, that Patent Owner had not shown a reasonable likelihood that it satisfied the statutory and regulatory requirements associated with filing a motion to amend, and Petitioner had shown a reasonable likelihood that proposed substitute claim 13 is unpatentable. Patent Owner then filed a Revised Motion to Amend (Paper 21, “Mot.”), and Petitioner filed an Opposition (Paper 23, “Opp.”). Patent Owner did not file a Reply to the Opposition. An oral hearing was held on January 14, 2022, and a transcript of the hearing is included in the record (Paper 28). Petitioner presented arguments during the hearing, and Patent Owner rested on its papers. *Id.* at 4:15–16:19.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 328(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–12 are unpatentable. We also determine that Petitioner has met its burden to show by a preponderance of the evidence

that proposed substitute claim 13 is unpatentable. Accordingly, we *deny* Patent Owner’s Revised Motion to Amend.

B. Related Matters

Petitioner states that the ’534 patent is related to two other patents, U.S. Patent Nos. 8,392,311 B2 and 7,146,336 B2, asserted in *OANDA Corp. v. GAIN Capital Holdings, Inc.*, No. 2:20-cv-5784 (D.N.J.), and challenged, respectively, in Cases CBM2020-00021 and CBM2020-00022 where institution of covered business method patent review was denied. *See* Pet. 2–3. Although the ’534 patent is not asserted in the district court case, Patent Owner charged Petitioner with infringement of the ’534 patent in two letters dated October 25, 2018, and March 5, 2020. *Id.* at 17 (citing Exs. 1033, 1035).

C. The ’534 Patent

The ’534 patent discloses “methods of using real-time trading models to trade on foreign exchange markets.” Ex. 1001, col. 1, ll. 13–15. “An exchange rate is the price at which one national currency can be exchanged for another. The most common currency value notion is the bilateral exchange rate (or simply the foreign exchange (FX) rate) quoted by an FX trader or reported by a quote vendor.” *Id.* at col. 1, ll. 19–23. The ’534 patent explains that “[a]lthough the FX market operates continuously, individual traders or institutions generally participate in this market for only part of each day. There [was] thus a need for trading models that take . . . local business hours and holidays into account.” *Id.* at col. 1, ll. 42–45. There was also “a need for trading models that offer real-time analysis of FX-rate movements and generate explicit trading recommendations” and

“a further need for models that follow the FX market and imitate it as closely as possible.” *Id.* at col. 1, ll. 46–48, 63–64. According to the ’534 patent, a trading model should go “beyond predicting a price change: it should decide whether a certain action has to be taken” based on “the specific risk profile [of the model’s user], the trading history [of the user], and institutional constraints such as business hours.” *Id.* at col. 1, ll. 50–60. The ’534 patent explains that

[a]t the most general level, a preferred trading model comprises a set of indicator computations combined with a collection of rules. . . . [I]ndicator computations provide an analysis of past price movements. The indicators are mapped into actual trading positions by applying various rules. For instance, a model may enter a long position if an indicator exceeds a certain threshold. Other rules determine whether a deal may be made at all, and the timing of a recommendation. Thus, indicator computations are based on price history, and a collection of rules determines the applicability of the indicator computations to the generation of trading recommendations.

Id. at col. 3, ll. 38–50. An indicator “provides a measure of whether a new position should be entered.” *Id.* at col. 6, ll. 4–5. “In the simplest form, an indicator crossing a predefined threshold may cause a rule to be activated that in turn causes such a change in position to occur. Thus the relative values of the indicators signify internal trading recommendations that are subsequently refined through the application of various rules.” *Id.* at col. 6, ll. 8–13. An example of a “rule” is a prohibition on new deals when “price movements since the previous deal are too small in either direction.” *Id.* at col. 6, ll. 13–19.

Figure 1 of the '534 patent is reproduced below.

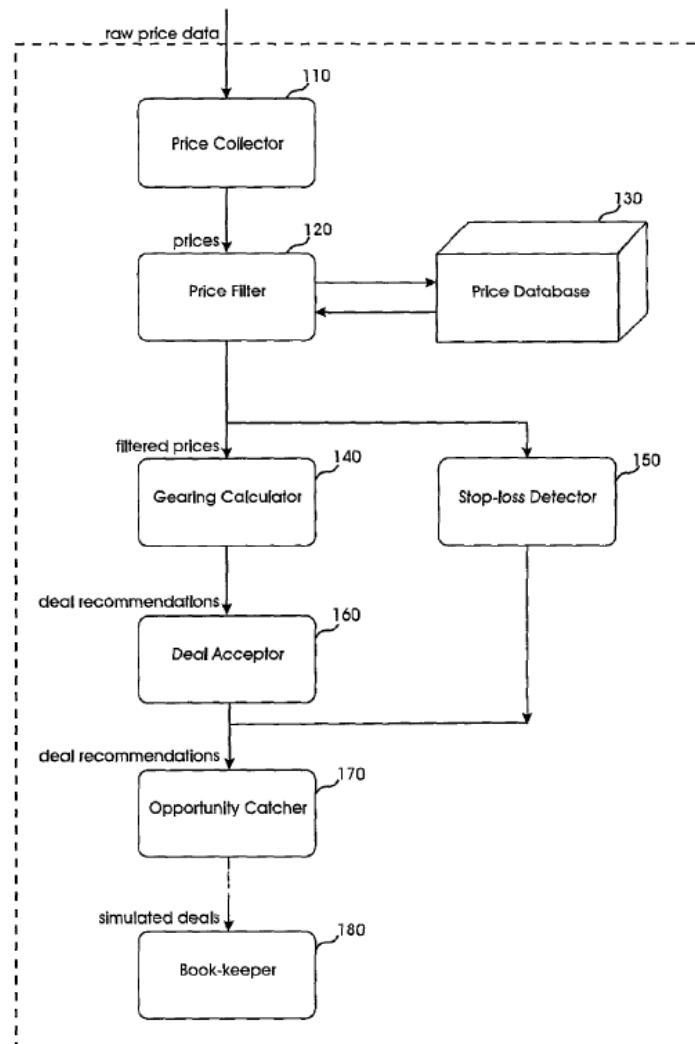


FIG. 1

Figure 1 depicts “a data flow and structure diagram of preferred trading model software.” *Id.* at col. 3, ll. 15–16. Price collector 110 “collects price quotes from data feeds received over a computer network”; price filter 120 “receives the collected price quotes and filters them in real-time, storing filtered price quotes in a price database 130”; gearing calculator 140 “specifies the recommended gearing (exposure size), based on indicator computations that depend on the received and filtered price quote data, trading rules that depend on past dealing history, current position, and other

quantities such as current unrealized return of an open position”; deal acceptor 160 “validates the recommendations of the gearing calculator 140” based on specified conditions; stop-loss detector 150 checks for whether a “stop-loss price” has been reached; opportunity catcher 170 “searches for a realistic price at which to execute the deal,” “executes a simulated deal,” and “provides signals to a human dealer”; and book-keeper 180 calculates “trading model statistics.” *Id.* at col. 3, l. 51–col. 4, 14. As shown in Figure 1, the trading model operates in a “data-flow paradigm” where reception of a new price from a commercial quote-vendor or a timer causes a defined event, which triggers the next action in sequence. *Id.* at col. 9, l. 62–col. 10, l. 16. “Software of a preferred embodiment [of the invention] is not constructed as a single huge program with all the required functionality residing in that one entity,” but rather “as a collection of separate programs” each having a primary function (i.e., “a distributed system [where] the various programs run in parallel on several computers”). *Id.* at col. 5, l. 19–26. Doing so provides “several benefits,” such as increased reliability. *Id.* at col. 5, ll. 33–49.

The gearing calculator is “the heart of a preferred trading model,” as it provides the “intelligence and the ability to capitalize on movements in the FX markets.” *Id.* at col. 5, ll. 50–53. The gearing calculator analyzes “a set of indicators that are produced from the input price data” according to “trading rules that are functions of the past dealing history, the current position, and other quantities (e.g., the current unrealized return of an open position)” to “determine whether . . . a change of position” should be made. *Id.* at col. 5, l. 65–col. 6, l. 8. “The gearing calculator re-evaluates its position every time a new price tick is received from the quote-vendors.” *Id.* at col. 5, ll. 61–62.

The '534 patent explains that trading models based on “24 hours of business time (and therefore characterized by a specific hour of the day)” are inadequate because they are not “high-frequency data models” and only provide “trading recommendations at the same hour of each day.” *Id.* at col. 23, ll. 55–62, col. 25, ll. 1–4. As a solution to this problem, the '534 patent describes using “models at different hours” as “sub-models that are ingredients of a final model” (e.g., taking into account 24 sub-models, one for each hour of the day). *Id.* at col. 25, ll. 4–16.

Figure 7 of the '534 patent is reproduced below.

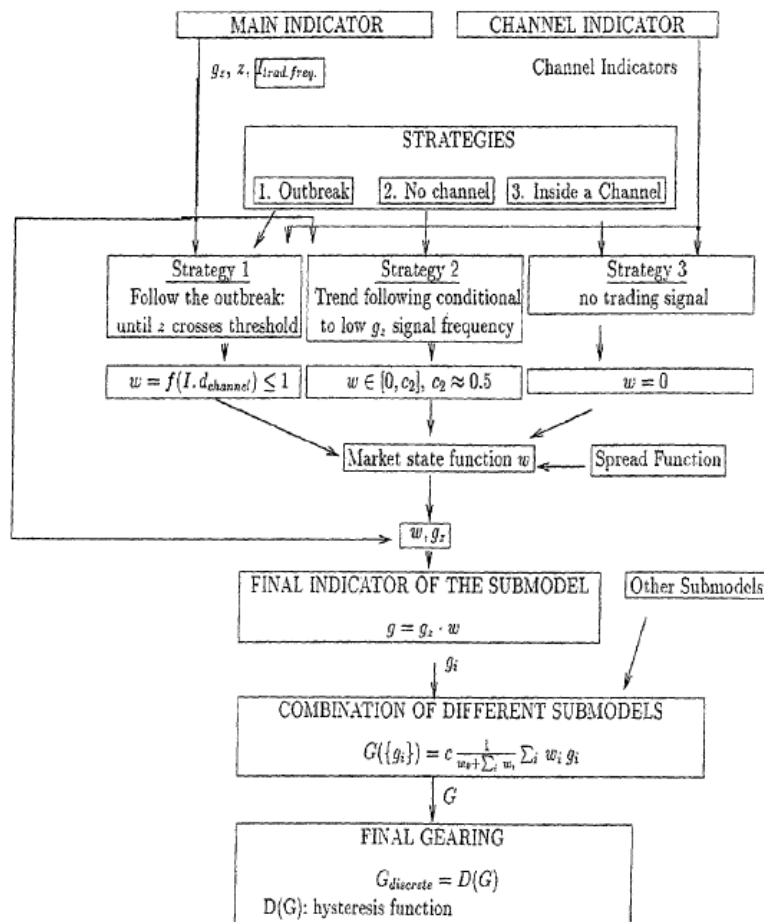


FIG. 7

Figure 7 depicts a trading model with two input indicators and where “the combination of different sub-models at the end leads to the final gearing

recommendation of the gearing calculator.” *Id.* at col. 32, ll. 63–67.

“Sub-models can be seen as complete trading models, but the final goal is to combine sub-models of different time horizons into one main model. The different sub-models share the same structure and algorithm, but the time horizons (and some dependent parameters) are different.” *Id.* at col. 33, ll. 12–16. As shown in Figure 7, the final gearing of one sub-model is combined with those of other sub-models to “provide the final, discrete gearing recommendation of the model.” *Id.* at col. 33, ll. 44–49. “The trading model works in real-time, with tick-by-tick intra-day data,” and thus can “deal with the strong intra-daily seasonality of volatility.” *Id.* at col. 33, ll. 50–55.

D. Illustrative Claim

Challenged claim 1 of the ’534 patent is independent. Claims 2–12 depend, directly or indirectly, from claim 1. Claim 1 recites:

1. A method of trading assets on a market, comprising the steps of:
 - (a) receiving price data for an asset over one or more computer networks;
 - (b) receiving current system position information;
 - (c) storing said received asset price data and said current system position information in a computer-readable medium;
 - (d) calculating trade recommendation information from each of a plurality of trading sub-models; wherein each sub-model is based on a different time of day, said calculation based on said received asset price data;
 - (e) calculating a trade recommendation regarding said asset based on said trade recommendation information from each of said trading sub-models.

E. Evidence

Petitioner filed a declaration from Bernard S. Donefer (Exhibit 1004) with its Petition and subsequently filed two additional declarations from Mr. Donefer (Exhibits 1038 and 1046) during trial. Patent Owner filed declarations from Ivan Zatkovich (Exhibit 2002) and Michael Stumm, Ph.D. (Exhibit 2005), with its Preliminary Response. However, Patent Owner states in its Response that it “affirmatively withdraws the testimony” of both witnesses. PO Resp. 2. Thus, we do not consider these declarations for purposes of this Decision.

F. Asserted Ground

Petitioner challenges claims 1–12 of the ’534 patent on the ground that the claims do not recite patent-eligible subject matter under 35 U.S.C. § 101. Pet. 3, 30–54.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art at the time of the ’534 patent (March 2001) would have, “through education or practical experience, obtained a working knowledge of electronic trading systems from both the computer science and finance perspectives,” including (1) “the equivalent of a bachelor’s degree in computer science, information systems, or a related field, and at least two years of work experience developing electronic trading systems,” and (2) “the equivalent of a bachelor’s degree in finance, economics, or a related field, and . . . knowledge of computer systems” for electronic trading. Pet. 11–12 (citing Ex. 1004 ¶ 23). Patent Owner agrees with Petitioner’s proposed definition. PO Resp. 3. Based on

the full trial record, including our review of the '534 patent and the types of problems and solutions described in the '534 patent and cited reference materials, we agree with Petitioner's proposed definition of the level of ordinary skill in the art and apply it for purposes of this Decision. *See, e.g.*, Ex. 1001, col. 1, l. 19–col. 2, l. 5 (describing in the “Background” section of the '534 patent various aspects of FX trading models and an alleged need for such models to “be based on data from continuous collection and treatment of FX quotes by market makers around the clock”).

B. Claim Interpretation

We interpret the challenged claims

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.300(b) (2019). “In determining the meaning of [a] disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006). Claim terms are given their plain and ordinary meaning as would be understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim

term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Petitioner and Patent Owner both argue that the terms of the challenged claims should be given their “ordinary and customary meaning,” but do not propose express interpretations for any terms. *See* Pet. 16; PO Resp. 4. In the Decision on Institution, we noted that during prosecution of the ’534 patent, the applicants stated that the term “current system position” in claim 1 “has a well-defined meaning to those skilled in the art” and means “the current stake in a particular security or market held by a system or organization.” Dec. on Inst. 10; *see* Pet. 7–8; Ex. 1002, 105–106, 112 (citing a 2003 finance dictionary definition of “position” as an “investor’s stake in a particular security or market”). We determined that the definition was consistent with the Specification of the ’534 patent and evidence of record at the time. Dec. on Inst. 10. Neither party disputes that interpretation in its papers filed after institution. Upon review of the parties’ arguments during trial and the evidence as a whole, we interpret “current system position” in claim 1 to mean “the current stake in a particular security or market held by a system or organization,” and conclude that no interpretation of any other term is necessary to decide the issues presented during trial. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citation omitted)).

C. Eligibility for Covered Business Method Patent Review

Section 18 of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), provides for the creation of a transitional program for reviewing covered business method patents, and limits reviews to persons or their privies that have been sued for infringement or charged with infringement of a “covered business method patent,” which does not include patents for “technological inventions.”¹ AIA §§ 18(a)(1)(B), 18(d)(1); see 37 C.F.R. § 42.302. In the Decision on Institution, we determined that Petitioner had shown that it was charged with infringement and the ’534 patent is a “covered business method patent.” Dec. on Inst. 11–18. Patent Owner does not dispute either point in its Response; therefore, any such arguments are waived. See *Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1330 (Fed. Cir. 2017); *In re NuVasive, Inc.*, 842 F.3d 1376, 1380–81 (Fed. Cir. 2016); Paper 11, 8 (“Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”). We maintain and incorporate herein our previous analysis. See Dec. on Inst. 11–18.

D. Constitutionality Arguments

Patent Owner argues that “granting CBM review and invalidating some or all of the ’534 [p]atent would amount to an unconstitutional taking in violation of the Takings Clause of the Fifth Amendment” and “also violate the Due Process Clause by depriving [Patent Owner] of its property without due process of law.” PO Resp. 13–14. Patent Owner further argues

¹ Petitioner filed its Petition on September 15, 2020, prior to the expiration of the transitional program.

that “the Board should deny the Petition based on a lack of constitutional authority” because Administrative Patent Judges of the Board are “‘principal officers’ who require Presidential appointment and Senate confirmation.” *Id.* at 15–17. We decline to consider Patent Owner’s constitutional challenges, as the issues have been addressed in *Celgene Corp. v. Peter*, 931 F.3d 1342 (Fed. Cir. 2019), and *United States v. Arthrex, Inc.*, 141 S.Ct. 1970 (2021).

E. Legal Standards

1. Subject Matter Eligibility

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

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

Concepts determined to be abstract ideas, and thus patent-ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent-eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 176; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . 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.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the

elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The Office published revised guidance on the application of § 101. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Guidance”).² Under the Guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
 - (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).
- Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:
- (3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or
 - (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Guidance, 84 Fed. Reg. at 56.

² We also have considered the October 2019 Patent Eligibility Guidance Update at https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf.

2. Obviousness

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a) (2006)).³ The question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.” *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Id.* When conducting an obviousness analysis, we consider a prior art reference “not only for what it expressly teaches, but also for what it fairly suggests.” *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019) (citation omitted).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled

³ The AIA amended 35 U.S.C. §§ 102, 103, and 112. Because the challenged claims of the ’534 patent have an effective filing date before the effective dates of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102, 103, and 112. See Ex. 1001, codes (22), (60).

artisan would have had a reasonable expectation of success in doing so.”
Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd., 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (citation omitted); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”). Also, “[t]hough less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016).

“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (citation omitted). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *accord In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’” (citation omitted)); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

F. Asserted Ground Based on 35 U.S.C. § 101

1. Claim 1

a) Step 1: Statutory Category

Petitioner challenges claim 1 on the ground that the claim fails to recite patent-eligible subject matter under 35 U.S.C. § 101. Pet. 30–45. We first determine “whether the claim is to a statutory category (Step 1),” namely a process, machine, manufacture, or composition of matter. Guidance, 84 Fed. Reg. at 53–54. Claim 1 of the ’534 patent recites a “method,” which is a “process” that is statutory subject matter under 35 U.S.C § 101.

b) Step 2A, Prong 1: Whether the Claim Recites an Abstract Idea

Under Step 2A, Prong 1 of the Guidance, we must determine whether claim 1 recites limitations that fall within any of the recognized categories of abstract ideas. The Guidance identifies certain groupings of abstract ideas that have been recognized under the case law: mathematical concepts, certain methods of organizing human activity, such as fundamental economic principles or practices, and mental processes. Guidance, 84 Fed. Reg. at 52. As part of this inquiry, we must examine the relevant limitations in the context of the claim language as a whole. *Alice*, 573 U.S. at 218 n.3. “The § 101 inquiry must focus on the language of the [a]sserted [c]laims themselves.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016); *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013) (“[T]he important inquiry for a § 101 analysis is to look to the claim.”).

Petitioner argues that claim 1 is directed to “time-based trade analysis,” which is a “fundamental economic practice.” Pet. 31–32.

Petitioner addresses each of the limitations of claim 1 and explains how they support Petitioner's contention that the claim, as a whole, is directed to the alleged abstract idea. *Id.* at 31–34. With respect to steps (a) and (b) of “receiving price data for an asset” and “current system position information,” and step (c) of “storing” the price data and current system position information, Petitioner argues that “[g]athering and storing price data and position information had long been a first step in market analysis, since these are key inputs for analyzing markets and making trade decisions.”⁴ *Id.* at 33. With respect to step (d) of “calculating trade recommendation information . . . based on said received asset price data,” Petitioner argues that the calculation and evaluation of indicators to make a trading decision are a “standard part of technical analysis.”⁵ *Id.* Regarding step (d)'s requirement that the calculation be from “each of a plurality of sub-models” each based on a “different time of day,” Petitioner contends that the use of sub-models is a “core function of time-based trade models.” *Id.* at 33–34. Finally, with respect to step (e) of “calculating a trade recommendation regarding said asset based on said trade recommendation

⁴ As explained further below in the context of Step 2A, Prong 2 and Step 2B of the Guidance, claim 1 recites that the price data is received over “one or more computer networks” and the price data and current system position information are stored in a “computer-readable medium.” *See infra* Sections II.F.1.c–d.

⁵ Mr. Donefer explains that there are two basic types of trade analysis. Fundamental analysis “estimates value and projects future prices by considering factors such as management, earnings, profits, and competition,” whereas technical analysis “typically analyzes past price histories, sometimes displayed as charts, to produce ‘indicators’ that are predictive of future market behavior.” Ex. 1004 ¶ 26 (citing Ex. 1011, 74). “Time-based analysis is central to technical analysis, and it is this type of analysis that the ’534 patent describes.” *Id.* (citing Ex. 1001, code (57); Ex. 1010, 1).

information from each of said trading sub-models,” Petitioner contends that calculating a trade recommendation is “the ultimate goal” of any trading analysis. *Id.* at 34. Petitioner has shown persuasively that, by virtue of these limitations, claim 1, as a whole, recites time-based trade analysis. *See id.* at 31–34.

Petitioner also explains why the limitations of claim 1 identified above amount to a fundamental economic practice long prevalent in commerce. *Id.* at 31–33. Petitioner argues that “[a]t [the] core [of time-based trade analysis] is the well-established understanding that technical analysis of changes in the market over time can be used to forecast market movements and inform trading decisions.” *Id.* at 32. According to Petitioner, “[t]raders have long used such analysis to develop time-dependent mathematical models—essentially a set of rules recognizing time-based trading patterns—and apply those models to price data for a particular asset in order to evaluate potential trades.” *Id.*

Petitioner’s position is supported by the testimony of Mr. Donefer and supporting documents in the record. Mr. Donefer explains, for example, that traders initially used “pencil-and-paper point and figure charts to illustrate and analyze time-based trends in market activity in trading various financial instruments.” Ex. 1004 ¶¶ 27–28 (citing Exs. 1007–1009, 1020). That type of analysis eventually evolved into more sophisticated mathematical models, computer-assisted modeling that could take into account multiple factors over different time intervals, and modeling using data for more granular time intervals than daily data (e.g., hourly, at every quote change). *Id.* ¶¶ 29–34 (citing Exs. 1016, 1019, 1020, 1021, 1023).

In particular, Mr. Donefer notes a 1992 article, O.V. Pictet et al., “Real-Time Trading Models for Foreign Exchange Rates,” *International*

Journal on Neural and Mass-Parallel Computing and Information Systems, vol. 2, no. 6, 713–744 (1992) (Ex. 1031, “Pictet”), authored by four of the named inventors of the ’534 patent and another individual, that uses language very similar to the ’534 patent Specification to describe indicators, the use of historical price data and “past trading history” to generate a trading recommendation, and hourly model calculations. See Ex. 1004 ¶¶ 47, 58, 62, 67, 70, 72–73, 75–77, 82–83; compare Ex. 1031, 714, 728, with Ex. 1001, col. 1, ll. 48–60, col. 3, ll. 38–50. Similar to the modeling described in the ’534 patent, Pictet discloses a “set of real-time trading models offering analysis of foreign exchange (FX) rate movements and providing explicit trading recommendations” based on “the continuous collection and treatment of FX quotes from market makers operating around the clock” and using “a distributed system of computers” performing data collection, rule-based analysis, and other tasks. See Ex. 1031, 713.

Patent Owner responds that Petitioner’s assertion that the claims are all directed to “time-based trade analysis” “improperly describes the claims at too high a level of abstraction, as warned against in” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335, 1337 (Fed. Cir. 2016). PO Resp. 5–6. We disagree. Petitioner’s articulation of the abstract idea to which claim 1 is allegedly directed is appropriately focused and tied to the specific language of the limitations of the claim. Petitioner explains how the recited “price data” and “current system position information” are the key inputs for time-based trade analysis and how calculating a trade recommendation using sub-models based on different times of day constitutes such analysis. See Pet. 31–34. Further, “time-based trade analysis” is not a general field, but rather a particular practice, namely the analysis of potential trades based on time. That type of analysis is reflected expressly in claim 1 via the use of a

plurality of sub-models where each is based on “a different time of day.” Petitioner’s analysis is persuasive, as it is consistent with the language of claim 1 and supported by the testimony of Mr. Donefer, which we credit.⁶

Based on the full record developed during trial, we are persuaded that claim 1 recites time-based trade analysis. Doing so is a fundamental economic practice, which is one of the certain methods of organizing human activity identified in the Guidance, and, thus, an abstract idea.

c) Step 2A, Prong 2: Whether the Judicial Exception is Integrated Into a Practical Application

The Supreme Court has long distinguished between abstract ideas themselves (which are not patent-eligible) and the integration of those abstract ideas into practical applications (which are patent-eligible). *See, e.g., Alice*, 573 U.S. at 217 (explaining that “in applying the § 101 exception, we must distinguish between patents that claim the ‘buildin[g] block[s]’ of human ingenuity and those that integrate the building blocks into something more” (quoting *Mayo*, 566 U.S. at 89), and stating that *Mayo* “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”); *Mayo*, 566 U.S. at 80, 84 (noting that the Court in *Diehr* found “the overall process patent eligible because of the way the additional steps of the process integrated the equation into the process as a whole,” but the Court in *Benson* “held that simply implementing a

⁶ Because we determine that Petitioner has made a sufficient showing that the limitations of claim 1 discussed above amount to a fundamental economic practice long prevalent in commerce, we need not reach Petitioner’s alternative argument that claim 1 recites mathematical concepts. *See* Pet. 35–36; Guidance, 84 Fed. Reg. at 52.

mathematical principle on a physical machine, namely a computer, was not a patentable application of that principle”). The U.S. Court of Appeals for the Federal Circuit likewise has distinguished between claims that are “directed to” a judicial exception (which require further analysis to determine their eligibility) and those that are not (which are therefore patent-eligible). See, e.g., *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314–16 (Fed. Cir. 2016); *Enfish*, 822 F.3d at 1335–36.

Consistent with Supreme Court and Federal Circuit precedent, the Guidance provides that, if a claim recites an abstract idea, it must be further analyzed to determine whether the recited judicial exception is integrated into a practical application. Guidance, 84 Fed. Reg. at 53. Specifically, under Step 2A, Prong 2 of the Guidance, a claim reciting an abstract idea is not “directed to” the abstract idea “if the claim as a whole integrates the recited judicial exception into a practical application of that exception.” *Id.* Step 2A, Prong 2 is evaluated by “(a) [i]dentifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.” *Id.* at 54–55. “A claim that integrates a judicial exception into a practical application will 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 53.

One example in which a judicial exception may be integrated into a practical application is when the claim includes “[a]n additional element [that] reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field.” *Id.* at 55. Petitioner

argues that claim 1 lacks any such additional elements, and we agree. *See* Pet. 36–38. The claim recites two computer components: “one or more computer networks” and a “computer-readable medium.” The functionality of those components is recited at a high level of generality. The asset price data is received over the “one or more computer networks” and the asset price data and current system position information are stored in the “computer-readable medium.” The Specification of the ’534 patent also describes the network and storage medium in generic terms. *See* Ex. 1001, col. 3, ll. 51–57 (disclosing, “in computer software that comprises preferred trading model software, a price collector 110 [that] collects price quotes from data feeds received over a computer network” and “price filter 120 . . . storing filtered price quotes in a price database 130”), col. 5, ll. 30–33. The recitation of generic computer components in claim 1 and the similar description in the Specification indicate that the abstract idea recited in the claim is not integrated into a practical application.

In addition, no technical detail is included in the claim as to how the two “calculating” steps (d) and (e) are performed; the claim only recites what they produce (i.e., “trade recommendation information” and a “trade recommendation”) and what they are “based on” (i.e., “asset price data” and “trade recommendation information”). *See* Pet. 37. And we do not find anything in the record to suggest that the mere use of “sub-models,” with no language in the claim reciting how the sub-model calculations are performed or even any language explicitly requiring the use of a computer for such calculations, would constitute an improvement in the functioning of technology.

Other examples in which a judicial exception may be integrated into a practical application are when “an additional element implements a judicial

exception with, or uses a judicial exception in conjunction with, a particular machine or manufacture that is integral to the claim,” “an additional element effects a transformation or reduction of a particular article to a different state or thing,” and “an additional element applies or uses the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment, such that the claim as a whole is more than a drafting effort designed to monopolize the exception.” Guidance, 84 Fed. Reg. at 55. Based on the full record developed during trial, we do not find any such additional elements in claim 1.

Patent Owner argues that claim 1 recites “a specific improvement in the functioning and operation of prior art computerized trading systems and methods for generating trading recommendations,” not “time-based trade analysis.” PO Resp. 6–7 (citing Ex. 1001, col. 5, ll. 19–24). According to Patent Owner, the method of claim 1 is “for solving specific problems arising from the inefficiencies of prior art computerized, market-maker trading systems which were too slow to provide real-time trading models or recommendations, each of which is necessary for modern, high-frequency trading.” *Id.* at 7. We disagree. The distributed computer system referenced by Patent Owner is described in the Specification as a “preferred embodiment.” See Ex. 1001, col. 5, ll. 19–24; Paper 8, 12 (acknowledging that “the preferred embodiment is a distributed, parallelized computer program”). The Specification likewise describes real-time operation in the context of a “preferred embodiment.” See Ex. 1001, col. 2, ll. 9–11 (“A preferred embodiment of the subject invention comprises a system and method for operating a set of real-time trading models.”), col. 4, ll. 58–60 (same), col. 13, ll. 46–47 (“Trading models used in a preferred embodiment are designed for use in a real-time service.”).

Claim 1 does not recite a system architecture or include any language requiring each of the sub-model calculations to be performed in parallel by a different computer or in real-time, as described in the “preferred embodiment” upon which Patent Owner relies. See Reply 6, 8; Ex. 1038 ¶¶ 22, 25–26. “[A]ny reliance on the specification in the § 101 analysis must always yield to the claim language.” *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 769 (Fed. Cir. 2019). “[T]he specification cannot be used to import details from the specification if those details are not claimed.” *Id.* We do not see why the Specification’s description of a preferred embodiment demonstrates integration into a practical application, given the generically recited computer components and broad language of the claim. A claim that recites “generalized steps to be performed on a computer using conventional computer activity” or “simply add[s] conventional computer components to well-known business practices” is directed to an abstract idea. *In re TLI Commc’ns LLC Patent Litig.*, 823 F.3d 607, 612 (Fed. Cir. 2016) (quoting *Enfish*, 822 F.3d at 1338).

Based on the full record developed during trial, we are persuaded that claim 1 as a whole, looking at the additional limitations of “one or more computer networks” and a “computer-readable medium,” does not integrate the recited abstract idea into a practical application. Petitioner has proven that claim 1 is directed to time-based trade analysis, which is a fundamental economic practice, one of the certain methods of organizing human activity identified in the Guidance.

d) Step 2B: Whether the Claim Provides an Inventive Concept

Under the second step of the *Alice* inquiry, we “scrutinize the claim elements more microscopically” for additional elements that might be

understood to “transform the nature of the claim” into a patent-eligible application of an abstract idea. *Electric Power Grp. v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (quoting *Alice*, 573 U.S. at 217). That is, we determine whether the claims include “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.’” *Alice*, 573 U.S. at 217–18 (quoting *Mayo*, 566 U.S. at 72–73). The relevant inquiry is whether “additional substantive limitations . . . narrow, confine, or otherwise tie down the claim so that, in practical terms, it does not cover the full abstract idea itself.” *Accenture*, 728 F.3d at 1344–45 (internal quotations and citation omitted). If the claimed elements involve “well-understood, routine, [and] conventional activity previously engaged in,” they do not include an “inventive concept.” *Mayo*, 566 U.S. at 72–73. Notably, the patent eligibility inquiry may contain underlying issues of fact. *Mortgage Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016). In particular, “[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

Consistent with the foregoing, under the Guidance, if a claim has been determined to be directed to a judicial exception at Step 2A, we must evaluate the additional elements individually and in combination at Step 2B to determine whether they provide an inventive concept (i.e., whether the additional elements amount to significantly more than the exception itself). Guidance, 84 Fed. Reg. at 56. We must consider in Step 2B whether an additional element or combination of elements: (1) “[a]dds a specific

limitation or combination of limitations that are not well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present,” or (2) “simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception, which is indicative that an inventive concept may not be present.” *Id.*

Petitioner has shown persuasively that claim 1 does not recite any element or combination of elements that would transform the claim into a patent-eligible application of the alleged abstract idea. Claim 1 merely recites generic and conventional computer components (i.e., “one or more computer networks” and a “computer-readable medium”) for receiving and storing certain data. *See* Pet. 41; *Alice*, 573 U.S. at 223 (“[T]he mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.”); *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 computer limitations does not make an otherwise ineligible claim patent-eligible.”); *see also Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1341 (Fed. Cir. 2017) (holding that the claims at issue, which “recite[d] both a generic computer element—a processor—and a series of generic computer ‘components’ that merely restate their individual functions, . . . merely describe the functions of the abstract idea itself, without particularity,” which is “not enough under step two”); *Mortgage Grader*, 811 F.3d at 1324–25 (holding that “generic computer components do not satisfy the inventive concept requirement”). Petitioner further contends that the reception and storage of the specific data recited in steps (a)–(c) (i.e., “asset price data” and “current system position information”) were “well-known, routine, and conventional steps in asset

trading,” relying on the testimony of Mr. Donefer and supporting documents in the record. Pet. 41 (citing Ex. 1004 ¶¶ 55–68; Exs. 1011, 1014, 1015, 1017, 1019, 1022, 1030, 1031, 1034). Patent Owner does not dispute Petitioner’s arguments regarding steps (a)–(c) in its Response. See PO Resp. 8–13. We agree with Petitioner’s assessment and credit Mr. Donefer’s testimony as to steps (a)–(c).

With respect to “calculating” steps (d) and (e), Petitioner argues that the steps “recite conventional trade-analysis practices at a high level of generality,” again relying on Mr. Donefer’s testimony and supporting documentation. Pet. 42. Petitioner contends that “traders routinely calculated multiple indicators (a type of ‘trade recommendation information’) from price-sensitive models and made trade determinations based on those indicators,” and the use of “sub-models” each based on a “different time of day” “merely reflects the well-known fact that intraday trading exhibited patterns at different times of day.” *Id.* at 42–43 (citing Ex. 1004 ¶¶ 26–34, 69–84; Exs. 1010, 1016, 1019–21, 1023, 1025, 1031). Petitioner also relies on Pictet, arguing that the article described the same approach to time-based trade analysis as claim 1 “a decade earlier” than the ’534 patent. *Id.* at 43. Specifically, Pictet’s trading model used “multiple activity functions (*i.e.* sub-models)” where the “timescale for indicator computations . . . could be ‘hours, days, weeks or years’” and “successive outputs were [] combined via a weighting function to produce a final indicator” for making a trade recommendation. *Id.* at 43–45 (quoting Ex. 1031, 729–730; citing Ex. 1004 ¶¶ 75, 77, 122–133, 135–139).

Patent Owner responds that steps (d) and (e) do not constitute well-understood, routine, and conventional activity. PO Resp. 8–13. According to Patent Owner, the steps “enable real-time trading models and

recommendations by teaching the system designer to parallelize the computation of the recommendations using a plurality of sub models, a novel and non-obvious technique, that improves upon the prior art systems and methods discussed in the Specification.” *Id.* at 9–11. Patent Owner contends that parallelized calculation improved on what was conventional at the time because “computer systems in the prior art . . . were unable to provide real-time trading models or recommendations for the hundreds or thousands of users of trading systems.” *Id.* at 12. Patent Owner argues that Petitioner and Mr. Donefer “fail to discuss or even acknowledge the innovation of breaking down trading recommendation calculations into sub-models so as to enable parallelization.” *Id.* at 11–12. Finally, Patent Owner argues that “time-based trade analysis” is “referenced in the [Specification] as the background technology that the ’534 [p]atent improves upon,” and the recited use of multiple sub-models based on different times of day improves on known technology of the time. *Id.* at 10–11.

We disagree. Claim 1 does not recite a distributed system architecture, sub-model calculations executed concurrently in parallel, or real-time operation for a large number of users, all of which Patent Owner relies on to show a patent-eligible application of the alleged abstract idea. *See* Reply 6, 8; Ex. 1038 ¶¶ 22, 25–26. Claim 1 broadly recites “calculating trade recommendation information from each of a plurality of trading sub-models,” each “based on a different time of day,” and “calculating a trade recommendation . . . based on said trade recommendation information from each of said trading sub-models.” The claim does not specify *how*, *when*, or *by what component* the calculations are performed. Thus, Patent Owner’s contention that steps (d) and (e) do not represent well-understood,

routine, and conventional activity is not commensurate with the language of the claim.

With respect to what is actually recited in the claim, we are persuaded based on the full trial record that the calculations are the abstract idea itself (i.e., the fundamental economic practice of “time-based trade analysis”), rather than additional elements that could transform the claim into a patent-eligible application of an abstract idea. *See supra* Section II.F.1.b; *BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1290 (Fed. Cir. 2018) (“[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.”).

Regardless, though, Petitioner also has provided persuasive evidence regarding the conventionality of steps (d) and (e), particularly given the broad manner in which they are recited in the claim. *See, e.g.*, Ex. 1004 ¶¶ 69–84; Ex. 1021, 115 (“It is widely documented that return volatility varies systematically over the trading day and that this pattern is highly correlated with the intraday variation of trading volume and bid-ask spreads.”); Ex. 1019, 13 (“Trading models offer a real-time analysis of foreign exchange movements and generate explicit trading recommendations. These models are based on the continuous collection and treatment of foreign exchange quotes by market makers around the clock at the tick-by-tick frequency level.”); Ex. 1031, 728–732 (describing modeling that accounts for time periods of different levels of activity, such as when particular FX markets are open, and using time intervals of “hours, days, weeks or years”). Petitioner also has provided a detailed explanation citing persuasive evidence that, even if claim 1 did require distributed parallel processing and real-time trading model calculations, both were

well-understood, routine, and conventional at the time of the '534 patent. See Reply 9–11, 15–17; Ex. 1038 ¶¶ 23 (citing, for example, Ex. 1031, 228–232), 29–35 (citing, for example, Ex. 1031, 718). We credit Mr. Donefer's testimony, which is supported by evidence in the record and unrebutted—Patent Owner did not address the evidence discussed in the Petition and Mr. Donefer's initial declaration in its Response, did not file a Sur-Reply addressing Mr. Donefer's reply declaration and cited evidence, and did not provide any contrary evidence in the record. See Reply 1, 3.

We determine that the limitations of claim 1, viewed individually and as an ordered combination, merely use well-understood, routine, and conventional computer components and functionality to perform time-based trade analysis. Based on the full record developed during trial, we are persuaded that claim 1 does not provide an inventive concept.

e) Conclusion

Based on the full record developed during trial, we are persuaded by Petitioner's arguments and supporting evidence that, when considered individually and as an ordered combination, the elements of claim 1 do no more than apply a certain method of organizing human activity, namely time-based trade analysis, which is a fundamental economic practice. See *Alice*, 573 U.S. at 217–18. In addition, we are persuaded that claim 1 does not recite anything in a manner sufficient to transform that abstract idea into a patent-eligible invention. See *id.* Petitioner has shown, by a preponderance of the evidence, that claim 1 is unpatentable as claiming patent-ineligible subject matter under 35 U.S.C. § 101.

2. *Claims 2–12*

Petitioner addresses the additional limitations of dependent claims 2–12 in its Petition, explaining why the claims are directed to the same abstract idea as claim 1 and do not recite anything that would transform the abstract idea into a patent-eligible invention, again with supporting testimony from Mr. Donefer. Pet. 34, 36, 38–40, 45–54; *see* Ex. 1004 ¶¶ 85–147. For example, claim 1 recites a “plurality of trading sub-models” and dependent claim 2 recites that “24 sub-models are used.” Petitioner explains that this simply limits “the number of sub-models used” in the trade analysis, “does not improve technology,” and was conventional because “hourly iterations of models was [] routinely done (there being 24 hours in a day).” Pet. 34, 38, 45–46; *see* Ex. 1004 ¶¶ 86–90 (citing Ex. 1031, 729). As another example, claim 3 recites that the method of claim 1 further comprises “the step of evaluating the performance of said sub-models using a risk-sensitive performance measure.” Claims 4 and 5, which depend from claim 3, recite that the risk-sensitive performance measure is, respectively, “used to optimize the performance of the trading models” or “an effective return.” Petitioner argues that the recited performance evaluation in claims 3–5 was “another standard part of trade analysis” and does not improve technology, risk-sensitive performance measures “were commonly used to evaluate the performance of trade models, since risk management is a critical factor in trading,” claim 4 “does not specify how th[e] optimization is performed,” “evaluating a trade model in order to optimize its performance” was a conventional practice, and “effective return” was a well-known “performance measure.” Pet. 34, 38, 46–47; *see* Ex. 1004 ¶¶ 91–98 (citing Ex. 1031, 734–737; Ex. 1006, 1–9; Ex. 1011, 77–80; Ex. 1019, 8; Ex. 1028, 36; Ex. 1032).

Patent Owner in its Response addresses all of the challenged claims together, referring only to the steps of claim 1, not any of the limitations of the dependent claims. *See* PO Resp. 4–13. We address Patent Owner’s arguments with respect to claim 1 above. *See supra* Section II.F.1. Further, Mr. Donefer’s testimony regarding the dependent claims is sufficiently supported by evidence in the record and is un rebutted by Patent Owner. *See* Reply 4.

Based on the full record developed during trial, we are persuaded by Petitioner’s arguments and supporting evidence that, when considered individually and as an ordered combination, the elements of claims 2–12 do no more than apply a certain method of organizing human activity, namely time-based trade analysis, which is a fundamental economic practice. *See Alice*, 573 U.S. at 217–18. In addition, we are persuaded that claims 2–12 do not recite anything in a manner sufficient to transform that abstract idea into a patent-eligible invention. *See id.* For the reasons stated in the Petition, which we adopt, and supported by the testimony of Mr. Donefer, Petitioner has shown, by a preponderance of the evidence, that dependent claims 2–12 are unpatentable as claiming patent-ineligible subject matter under 35 U.S.C. § 101.

G. Patent Owner’s Revised Motion to Amend

Pursuant to 35 U.S.C. § 326(d)(1) and 37 C.F.R. § 42.221(a), Patent Owner moves to replace claim 1 of the ’534 patent with proposed substitute claim 13. Mot. 1.⁷ The Motion is contingent on our determination as to

⁷ In a May 18, 2021 email to the Board, Patent Owner stated that the ’534 patent will expire on May 23, 2025. Paper 15, 1, 5 n.3.

whether a preponderance of the evidence establishes that claim 1 of the '534 patent is unpatentable. *Id.* As discussed above, we determine that original claim 1 of the '534 patent has been shown to be unpatentable by a preponderance of the evidence. *See supra* Section II.F.1. Therefore, we proceed to address Patent Owner's Revised Motion to Amend.

Petitioner provides a declaration from Mr. Donefer pertaining to Petitioner's Reply and in response to Patent Owner's original Motion to Amend (Exhibit 1038), and another declaration in response to Patent Owner's Revised Motion to Amend (Exhibit 1046).⁸ Patent Owner did not cross-examine Mr. Donefer or submit any declarant testimony of its own in support of its Revised Motion to Amend.

1. Proposed Substitute Claim 13

Claim 13 recites (with underlining indicating language added to claim 1 and brackets indicating language removed from claim 1):

13. A method of trading assets on a market using computers, comprising the steps of:

(a) receiving price data for an asset over one or more computer networks;

(b) receiving current system position information;

(c) storing said received asset price data and said current system position information in a computer-readable medium;

(d) calculating trade recommendation information from each of a plurality of trading sub-models; wherein each

⁸ Mr. Donefer testifies that because proposed substitute claim 13 in the Revised Motion to Amend is substantively identical to the version of the claim in the original Motion to Amend, his earlier analysis still applies. Ex. 1046 ¶¶ 2–3.

sub-model is based on a different time of day, said calculation based on said received asset price data;

(e) calculating a trade recommendation regarding said asset based on said trade recommendation information from each of said trading sub-models[.],

(f) wherein the method is performed by constructing a collection of separate programs that are executed on a plurality of computers,

wherein each of the plurality of separate programs runs in parallel with one or more other separate programs of the plurality of separate programs;

wherein the plurality of computers includes two or more computers;

(g) wherein the plurality of trading sub-models form a high-frequency grand model according to a set of 5 high-frequency parameters.

2. Statutory and Regulatory Requirements

Before considering the patentability of proposed substitute claims in a motion to amend, we first determine whether the motion meets the statutory and regulatory requirements set forth in 35 U.S.C. § 326(d) and 37 C.F.R. § 42.221. Pursuant to 37 C.F.R. § 42.221(d)(1), Patent Owner “bears the burden of persuasion to show, by a preponderance of the evidence,” that the Revised Motion to Amend complies with the requirements of 35 U.S.C. §§ 326(d)(1) and (d)(3), and 37 C.F.R. §§ 42.221(a)(2), (a)(3), (b)(1), and (b)(2).

a) Reasonable Number of Substitute Claims

A motion to amend may, “[f]or each challenged claim, propose a reasonable number of substitute claims.” 35 U.S.C. § 326(d)(1)(B). “The presumption is that only one substitute claim would be needed to replace

each challenged claim, and it may be rebutted by a demonstration of need.” 37 C.F.R. § 42.221(a)(3). Patent Owner proposes one substitute claim for one original claim. Mot. 1. Patent Owner has shown, by a preponderance of the evidence, that the number of proposed substitute claims is reasonable under 35 U.S.C. § 326(d)(1)(B) and 37 C.F.R. § 42.221(a)(3).

b) Responding to a Ground of Unpatentability

“A motion to amend may be denied where . . . [t]he amendment does not respond to a ground of unpatentability involved in the trial.” 37 C.F.R. § 42.221(a)(2)(i). In its proposed substitute claim 13, Patent Owner adds limitations to original claim 1 being replaced and explains why it believes claim 13 is patent-eligible under 35 U.S.C. § 101, the sole ground of unpatentability involved in the trial. Mot. 3–6, App’x A. Patent Owner has shown, by a preponderance of the evidence, that the amended language in proposed substitute claim 13 is responsive to the ground of unpatentability involved in this trial under 37 C.F.R. § 42.221(a)(2)(i). We address the parties’ arguments on the merits of whether claim 13 is patent-eligible under 35 U.S.C. § 101 below. *See infra* Section II.G.3.(a).

c) Scope of the Proposed Substitute Claim

A motion to amend “may not enlarge the scope of the claims of the patent.” 35 U.S.C. § 326(d)(3); *see* 37 C.F.R. § 42.221(a)(2)(ii). Patent Owner argues that “no substitute claim enlarges the scope of the claim that it replaces” because proposed substitute claim 13 only adds limitations and does not remove any limitations from claim 1. Mot. 2–3. Patent Owner has shown, by a preponderance of the evidence, that claim 13 does not enlarge the scope of the original claims.

A motion to amend also “may not . . . introduce new matter.” 35 U.S.C. § 326(d)(3); *see* 37 C.F.R. § 42.221(a)(2)(ii). “New matter is any addition to the claims without support in the original disclosure.” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 7 (PTAB Feb. 25, 2019) (precedential) (“*Lectrosonics*”) (citing *TurboCare Div. of Demag Delaval Turbomachinery Corp. v. Gen. Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001)).⁹ In order to show that an amendment does not introduce new subject matter, a motion to amend must set forth “[t]he support in the original disclosure of the patent for each claim that is added or amended” and “[t]he support in an earlier-filed disclosure for each claim for which benefit of the filing date of the earlier filed disclosure is sought.” 37 C.F.R. § 42.221(b). The test for compliance with the written description requirement of 35 U.S.C. § 112, first paragraph, is whether “the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). “[T]he hallmark of written description is disclosure. . . . [T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.” *Id.*

In its Revised Motion to Amend, Patent Owner provides citations and explanation as to why proposed substitute claim 13 is supported by U.S. Patent Application No. 09/855,633 (Ex. 1002, 202–283, “the

⁹ The *Lectrosonics* decision originated from an *inter partes* review. The decision, however, applies equally to a covered business method patent review because the statutory provisions and regulations that govern a motion to amend are identical in both types of proceedings. *Compare* 35 U.S.C. § 316(d) *and* 37 C.F.R. § 42.121, *with* 35 U.S.C. § 326(d) *and* 37 C.F.R. § 42.221.

'633 application”), which issued as the '534 patent. Mot. 6–7, App’x A. We have reviewed proposed substitute claim 13, the '633 application, and Patent Owner’s citations to supporting disclosures in the '633 application, and determine that Patent Owner has shown, by a preponderance of the evidence, that claim 13 does not introduce new matter under 35 U.S.C. § 326(d)(3) and 37 C.F.R. § 42.221(a)(2)(ii).

d) Conclusion

We determine that Patent Owner’s Revised Motion to Amend meets the statutory and regulatory requirements of 35 U.S.C. § 326(d) and 37 C.F.R. § 42.221, and proceed to the issue of whether Petitioner has met its burden of persuasion with respect to patentability.

3. Patentability

Pursuant to 37 C.F.R. § 42.221(d)(2), Petitioner “bears the burden of persuasion to show, by a preponderance of the evidence,” that proposed substitute claim 13 is unpatentable. Petitioner argues that proposed substitute claim 13 fails to recite patent-eligible subject matter under 35 U.S.C. § 101, is indefinite under 35 U.S.C. § 112, second paragraph, and would have been obvious under 35 U.S.C. § 103(a). Opp. 3–25. For the reasons explained below, we determine that Petitioner has met its burden to show, by a preponderance of the evidence, that claim 13 is unpatentable as claiming patent-ineligible subject matter under 35 U.S.C. § 101 and obvious under 35 U.S.C. § 103(a), and need not reach Petitioner’s arguments regarding definiteness under 35 U.S.C. § 112, second paragraph.

a) Subject Matter Eligibility

(1) Step 1: Statutory Category

Claim 13, which is proposed as a substitute for original claim 1, recites a “method” that is statutory subject matter under 35 U.S.C. § 101.

(2) Step 2A, Prong 1: Whether the Claim Recites an Abstract Idea

As explained above, original claim 1 is directed to time-based trade analysis. *See supra* Sections II.F.1.b–c. Petitioner argues that proposed substitute claim 13 is directed to the same fundamental economic practice or, alternatively, “high-frequency time-based trade analysis using distributed parallel processing and parameters,” which likewise is a fundamental economic practice. Opp. 3–7.

Limitation (f) of claim 13 adds the requirement that the method be performed by separate programs run in parallel on different computers, and limitation (g) adds the requirement that the plurality of trading sub-models form a “high-frequency grand model according to a set of 5 high-frequency parameters.” Patent Owner argues that each of these is “a specific, non-abstract, concrete limitation, which causes the claim to be not directed to an abstract idea.” Mot. 4–5. Petitioner responds that limitation (f) “does not alter the claim’s character” because it provides only a general instruction on how to implement time-based trade analysis on generic computers, and limitation (g) likewise “fails to alter the claim’s character” because the “high-frequency” nature of the grand model at most “describes the speed” at which the time-based trade analysis is performed. Opp. 5–7.

We agree with Petitioner. Claim 13 recites the same “basic steps of time-based trade analysis” but using a “high-frequency” grand model and parameters, without reciting any “specifics about what the high-frequency

parameters are or how they are used to form the high-frequency [grand model].” *See id.* Claim 13 thus limits the time-based trade analysis to being “high-frequency” in character, but “does not make the claim[] any less abstract.” *See id.* at 7. Based on the full record developed during trial, we are persuaded that the original limitations of claim 1 recite time-based trade analysis, for the reasons stated above, and added limitation (g) only places limitations on the speed of such analysis. *See supra* Section II.F.1.b. Claim 13 recites high-frequency time-based trade analysis, which is a fundamental economic practice, one of the certain methods of organizing human activity identified in the Guidance, and, thus, an abstract idea.¹⁰ We address limitation (f) below in assessing Step 2A, Prong 2.

(3) Step 2A, Prong 2: Whether the Judicial Exception is Integrated Into a Practical Application

Consistent with Supreme Court and Federal Circuit precedent, the Guidance provides that a claim reciting an abstract idea must be further analyzed to determine whether the recited judicial exception is integrated into a practical application of that exception. Guidance, 84 Fed. Reg. at 53. Step 2A, Prong 2 is evaluated by “(a) [i]dentifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.” *Id.* at 54–55. One example in which a judicial exception may be integrated

¹⁰ We made the same determination in the Preliminary Guidance, based on the record at the time, as to original proposed substitute claim 13 (which is substantively identical to claim 13 in the Revised Motion to Amend). *See* Paper 20, 8.

into a practical application is when the claim includes “[a]n additional element [that] reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field.” *Id.* at 55.

Regarding limitation (f), Patent Owner argues that the limitation of “separate programs” each running “in parallel with one or more other separate programs” narrows the claimed method to “being practiced on a specific software architecture,” and the limitation of execution on “a plurality of computers” narrows the claimed method to “a specific hardware architecture.” Mot. 4–5. Regarding limitation (g), Patent Owner argues that the added language “removes any possibility that the method is directed simply to ‘time based trade analysis’ or any other purportedly abstract idea.” *Id.* at 5.

Petitioner responds that limitations (f) and (g) do not “provide a practical application of time-based trade analysis that improves technology.” Opp. 8. Petitioner contends that “[d]istributed parallel processing was already well known, and the claim offers no specifics about *how* distributed parallel processing is integrated into the abstract method.” *Id.* at 9 (citing Ex. 1038 ¶¶ 29–36, 48–50) (emphasis added). Petitioner also argues that “claim 13 does not describe any feature that would make the speed or frequency of the model calculations higher than prior models,” and “[u]sing ‘high-frequency’ models and parameters thus did not improve technology, nor did using five such parameters.” *Id.* at 9–10.

We incorporate our analysis above of the computer components “one or more computer networks” and a “computer-readable medium” present in both original claim 1 and proposed substitute claim 13, and turn to limitations (f) and (g) added to proposed substitute claim 13. *See supra* Section II.F.1.c.

With respect to limitation (f), claim 13 adds generic computer components (i.e., a “plurality of computers” and a “plurality of separate programs”) and does not include any technical detail as to *how* the calculations of the recited method are performed, other than that the separate programs are executed “in parallel.” See Guidance at 55 & n.30; *cxLoyalty, Inc. v. Maritz Holdings Inc.*, 986 F.3d 1367, 1378 (Fed. Cir. 2021) (“[T]he claims provide no useful guidance as to how this purported function [of using a hidden program account to facilitate a transaction between a participant and a vendor] is achieved and thus cannot be directed to a technological solution.”); *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1365 (Fed. Cir. 2020) (“[T]o be directed to a patent-eligible improvement to computer functionality, the claims must be directed to an improvement to the functionality of the computer or network platform itself.”); *University of Fla. Res. Found., Inc. v. Gen. Elec. Co.*, 916 F.3d 1363, 1368–69 (Fed. Cir. 2019) (holding claims relating to format conversion ineligible where the “drivers [were] described in purely functional terms” and the claims did not “explain[] how the drivers do the conversion that [the patent owner] points to” (emphasis omitted)); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (“Claims that amount to nothing significantly more than an instruction to apply an abstract idea using some unspecified, generic computer and in which each step does no more than require a generic computer to perform generic computer functions do not make an abstract idea patent-eligible because claiming the improved speed or efficiency inherent with applying the abstract idea on a computer does not provide a sufficient inventive concept.” (internal quotations, alterations, and citations

omitted)). We are persuaded that the added language of limitation (f) does not integrate the recited abstract idea into a practical application.

With respect to limitation (g), we conclude, for the reasons explained above, that the language is part of the fundamental economic practice of high-frequency time-based trade analysis. *See supra* Section II.G.3.a.(2).

Based on the full record developed during trial, we are persuaded that proposed substitute claim 13 as a whole, looking at the additional limitation of running in parallel a “plurality of separate programs” on a “plurality of computers” (as well as receiving data over “one or more computer networks” and storing data in a “computer-readable medium,” originally addressed in the context of claim 1) does not integrate the abstract idea into a practical application. Petitioner has proven that proposed substitute claim 13 is directed to high-frequency time-based trade analysis, which is a fundamental economic practice, one of the certain methods of organizing human activity identified in the Guidance.

(4) Step 2B: Whether the Claim Provides an Inventive Concept

At *Alice* step two, we “scrutinize the claim elements more microscopically” for additional elements that might be understood to “transform the nature of the claim” into a patent-eligible application of an abstract idea. *Electric Power*, 830 F.3d at 1353–54 (quoting *Alice*, 573 U.S. at 217). The additional elements must be distinct from those reciting the abstract idea itself, as “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.” *BSG Tech*, 899 F.3d at 1290. Claim elements that involve “well-understood, routine, [and] conventional activity previously engaged in” are insufficient to supply

an “inventive concept.” *Mayo*, 566 U.S. at 73. The Federal Circuit has explained the inquiry as follows:

The appropriate question is not whether the entire claim as a whole was “well-understood, routine [and] conventional” to a skilled artisan (*i.e.*, whether it lacks novelty), but rather, there are two distinct questions: (1) whether each of “the [elements] in the claimed [product] (apart from the natural laws themselves) involve well-understood, routine, conventional activity previously engaged in by researchers in the field,” and (2) whether all of the steps “*as an ordered combination* add[] nothing to the laws of nature that is not already present when the steps are considered separately.” In other words, beyond the [abstract idea], what elements in the claim may be regarded as the “inventive concept”?

Chamberlain Grp., Inc. v. Techtronic Indus. Co., 935 F.3d 1341, 1349 (Fed. Cir. 2019) (citations omitted). Consistent with Supreme Court and Federal Circuit precedent, the Guidance provides that, even if an additional claim element does not integrate an abstract idea into a practical application, if “reevaluation indicates that the element is unconventional or otherwise more than what is well-understood, routine, conventional activity in the field, this finding may indicate that an inventive concept is present and that the claim is thus eligible.” Guidance, 84 Fed. Reg. at 56. For example, a “combination of steps [may] gather data in an unconventional way and therefore include an ‘inventive concept.’” *Id.*

Patent Owner contends that the combination of the “hardware architecture” and “software architecture” recited in limitation (f), and the use of a “high-frequency grand model according to a set of 5 high-frequency parameters” in limitation (g), each represent a “specific novel technological advance which . . . provides an inventive step.” Mot. 4–5. Petitioner responds that “the basic trade-modeling steps and generic computer

functionality recited in claim 13 were well-known, routine, and conventional.” Opp. 10 (citing Ex. 1004 ¶¶ 52–54; Ex. 1038 ¶¶ 43–57). Petitioner argues that the “distributed parallel processing” recited in limitation (f) is “merely a high-level recitation of conventional computer functionality,” given that the claim “says nothing about how the separate programs are ‘construct[ed],’ what functions the programs perform, which aspects of the method are performed in parallel, or any other implementation details.” *Id.* at 11–12. Petitioner further contends that limitation (g) “recites the well-known, routine, and conventional use of parameters when combining the output of sub-models.” *Id.* at 13. Petitioner relies on the testimony of Mr. Donefer in support of its assertions regarding the alleged conventionality of limitations (g) and (f). *Id.* at 10–14 (citing Ex. 1004 ¶¶ 29–33, 42; Ex. 1038 ¶¶ 30–36, 48–50, 53–58; Exs. 1012, 1015, 1019, 1027, 1031, 1032, 1041, 1043, 1044). Petitioner also explains why all of the limitations of claim 13 as an ordered combination do not constitute an inventive concept. *Id.* at 14 (citing Ex. 1004 ¶¶ 52–53; Ex. 1038 ¶ 58).

Petitioner has shown persuasively that claim 13 does not recite any element or combination of elements that would transform the claim into a patent-eligible application of the alleged abstract idea. Limitations (f) and (g) add generic and conventional computer components (i.e., a “plurality of separate programs” running in parallel on a “plurality of computers”). We credit the testimony of Mr. Donefer that limitations (f) and (g) constitute well-understood, routine, and conventional activity, as that testimony is sufficiently explained, supported by citations to documents in the record, and un rebutted by Patent Owner.

In particular, we note the following. With respect to limitation (f), parallel processing systems were “widely available commercially” by the

1990's. Ex. 1042, 5, 7; *see* Opp. 12–13; Ex. 1038 ¶¶ 34–35. Pictet (dated 1992) also includes language very similar to limitation (f) in a section titled “Distributed architecture”:

The [Olsen Information System (OIS)] is not constructed as a single huge program with all the required functionality residing in that one entity. Rather it is constructed as a *collection of separate programs*. In computer-speak, the system is said to be a distributed system because the *various programs run in parallel on several computers*.

Each such program performs one logical operation. . . . Splitting up the system into several logical components confers several benefits

Ex. 1031, 718; *see* Opp. 9. With respect to limitation (g), Mr. Donefer explains how, “[b]ased on [his] experience, the formation of models from multiple sub-models based on parameters was well-known, routine, and conventional long before 2001,” citing as examples the well-known use of time parameters, voting scheme parameters, threshold parameters, and stop-loss and stop-profit orders when forming trading models. Ex. 1038 ¶¶ 52–56; *see* Ex. 1046 ¶¶ 10–11 (noting a typographical error regarding cited support for paragraph 55 in Mr. Donefer’s reply declaration). As to the requirement of “high-frequency” parameters for a “high-frequency” grand model, Mr. Donefer explains that “the frequency characteristics of both the inputs and the outputs of conventional trading models were at least” hourly. Ex. 1038 ¶ 57. Pictet, for example, describes “real-time” models. *See* Ex. 1031, 713 (“A set of real-time trading models offering analysis of foreign exchange (FX) rate movements and providing explicit trading recommendations is presented. These models are based on the continuous collection and treatment of FX quotes from market makers operating around

the clock.”), 714 (“Our trading models offer real-time analysis of FX-rate movements and generate explicit trading recommendations.”).

Based on the full record developed during trial, Petitioner has shown that the limitations of proposed substitute claim 13, viewed individually and as an ordered combination, merely use well-understood, routine, and conventional computer components and functionality to perform high-frequency time-based trade analysis.

(5) Conclusion

Petitioner has proven, by a preponderance of the evidence, that proposed substitute claim 13 is unpatentable as claiming patent-ineligible subject matter under 35 U.S.C. § 101.

b) Obviousness

Petitioner argues in its Opposition that proposed substitute claim 13 is unpatentable over Pictet under 35 U.S.C. § 103(a). Opp. 16–25. Patent Owner did not file a Reply responding to Petitioner’s obviousness arguments in the Opposition.¹¹

As an initial matter, we determine that a preponderance of the evidence supports that Pictet is a prior art printed publication under 35 U.S.C. § 102(b). Pictet is an article from the *International Journal on Neural and Mass-Parallel Computing and Information Systems*, and includes on its face a copyright date of 1992 and an International Standard

¹¹ Petitioner made nearly identical obviousness arguments based on Pictet in its Opposition to Patent Owner’s original Motion to Amend. *Compare* Opp. 16–25 *with* Paper 19, 16–25. Patent Owner did not address the issue of obviousness in its Revised Motion to Amend either.

Serial Number (“ISSN”) of 1210-0552. *See* Ex. 1031; Ex. 1038 ¶ 30 (testifying that Pictet was “published . . . in 1992”). Pictet lists as authors O.V. Pictet, M.M. Dacorogna, U.A. Müller, R.B. Olsen, and J.R. Ward. Ex. 1031, 713. Four of those individuals—Olivier V. Pictet, Michael M. Dacorogna, Ulrich A. Müller, and Richard B. Olsen—also are named inventors of the ’534 patent. Ex. 1001, code (76). The ’534 patent also lists a number of similar journal articles authored by various combinations of those individuals and others in the 1990–2000 timeframe. *See, e.g., id.* at col. 4, ll. 32–39, col. 11, ll. 3–9, col. 32, ll. 18–23, col. 34, ll. 26–31. Patent Owner does not dispute that Pictet is a prior art printed publication. *See* Paper 20, 11.

Petitioner argues that Pictet teaches all of the limitations of claim 13 and a person of ordinary skill in the art would have had reason to combine Pictet’s teachings to achieve the method recited in the claim.¹² Opp. 16.

With respect to the preamble of claim 13, Petitioner argues that Pictet teaches a method of using computers to run real-time trading models that make recommendations for FX deals. *Id.* at 17 (citing Ex. 1031, 713–714, 723; Ex. 1038 ¶ 60). For the reasons stated by Petitioner and Mr. Donefer, and to the extent the preamble is limiting, we find that Pictet teaches the preamble of claim 13.

With respect to limitation (a), Petitioner argues that Pictet teaches collecting FX price quotes over a computer network. *Id.* (citing Ex. 1031,

¹² As Petitioner correctly points out, much of Pictet appears to be nearly identical to the description of a “preferred embodiment” in the Specification of the ’534 patent. *See* Opp. 16–17; *compare* Ex. 1031, 728–742, *with* Ex. 1001, col. 10, l. 17–col. 19, l. 58, cols. 43–44 (Tables 2–4).

713–716, 718, 719; Ex. 1038 ¶ 61). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (a).

With respect to limitation (b), Petitioner argues that Pictet teaches a trading model that receives “current system position information” because the model displays the “current position” and evaluates the “current position” as an input for making trading recommendations.¹³ *Id.* at 17–18 (citing Ex. 1031, 714, 716, 720, 732; Ex. 1038 ¶ 62). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (b).

With respect to limitation (c), Petitioner argues that Pictet teaches a price database that stores “received asset price data” in a computer-readable medium. *Id.* at 18 (citing Ex. 1031, 718; Ex. 1038 ¶ 63). Petitioner further contends that a person of ordinary skill in the art “would have understood that for the computer system to use and reevaluate the current system position information [as recited in limitation (b)], that information would also be stored in a computer-readable medium.” *Id.* (citing Ex. 1038 ¶ 63). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (c).

With respect to limitation (d), Petitioner argues that a person of ordinary skill in the art “would have understood sub-models ‘based on a different time of day,’ as recited in step (d), to encompass models run successively at different times of day,” and “would have understood ‘trade recommendation information’ to encompass an indicator.” *Id.* at 19 (citing Ex. 1001, col. 2, ll. 16–20, col. 25, ll. 1–10; Ex. 1038 ¶¶ 64, 65); *see* Ex. 1001, col. 25, ll. 7–16 (explaining that models updated hourly can be

¹³ As explained above, we interpret “current system position” to mean “the current stake in a particular security or market held by a system or organization.” *See supra* Section II.B.

regarded as “simply sub-models that are ingredients of a final model,” referred to as “the grand model,” where “[t]he grand model . . . acts at any hour, on the hour”). Petitioner contends that Pictet teaches iterative calculations of indicators at different hours, which correspond to the claimed sub-models each based on a different time of day. Opp. 19–20 (citing Ex. 1038 ¶ 66). Petitioner cites Pictet’s “indicators” that are a “function only of time and the price history,” “activity functions” that are “functions of the time within a day and of the nature of the weekday,” and “repeated application” of a moving average. *Id.* (citing Ex. 1031, 728–732). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (d).

With respect to limitation (e), Petitioner argues that Pictet teaches “calculating trade recommendations for an FX asset based on the indicators.” *Id.* at 20 (citing Ex. 1031, 730–732; Ex. 1038 ¶ 67). Petitioner points to Pictet’s iterative calculation of a moving average, where each iteration incorporates the previous outputs of the sub-models. *Id.* For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (e).

With respect to limitation (f), Petitioner argues that Pictet teaches a system that “is constructed as a collection of separate programs” where “various programs run in parallel on several computers.” *Id.* at 20–21 (quoting Ex. 1031, 718; citing Ex. 1038 ¶ 68). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (f).

With respect to limitation (g), Petitioner argues that although limitation (g) recites five high-frequency parameters for the high-frequency grand model, the claim is open-ended (because it uses the term “comprising”) and does not require any particular parameters. *Id.* at 21.

According to Petitioner, a person of ordinary skill in the art “would have viewed Pictet’s model as a ‘grand’ model, as that term is used in the ’534 patent, because it combines the outputs of multiple previous iterations.” *Id.* at 21–22 (citing Ex. 1001, col. 25, ll. 1–19; Ex. 1038 ¶ 70). Petitioner contends that Pictet teaches a system that analyzes data in “real-time,” which a person of ordinary skill in the art would have understood as “high-frequency.” *Id.* at 22 (citing Ex. 1031, 713–714, 743 (stating that “[o]ur models are running real-time in continuing *ex ante* testing and our customers are actively following their recommendations,” “[t]he real-time processing of large quantities of data allows the models to adapt smoothly to rapidly changing market conditions,” and “high frequency data” is used); Ex. 1038 ¶ 71). Petitioner further argues that a person of ordinary skill in the art would have understood Pictet to teach limitation (g) because “Pictet teaches forming its modeling according to at least five parameters that are the same, or at least analogous to, the ’534 patent’s exemplary high-frequency parameters,” including “stop-loss and stop-profit parameters,” a “time parameter,” a “voting scheme,” and “several threshold parameters for evaluating whether the indicator warrants a trade recommendation.”¹⁴ *Id.* at 23–24 (citing Ex. 1031, 718–723, 729–732,

¹⁴ We agree with this analysis of Petitioner and Mr. Donefer equating Pictet’s disclosure with the exemplary “high-frequency grand model” and “high-frequency parameters” described in the Specification of the ’534 patent. Thus, under the particular factual circumstances of this case, we are able to decide the issue of obviousness without resolving Petitioner’s arguments regarding definiteness under 35 U.S.C. § 112, second paragraph. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 813 (Fed. Cir. 2021) (“The indefiniteness of a limitation . . . precludes a patentability determination only when the indefiniteness renders it logically impossible for the Board to reach such a decision.”); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x

737–738; Ex. 1038 ¶¶ 73–74). For the reasons stated by Petitioner and Mr. Donefer, we find that Pictet teaches limitation (g).

Finally, Petitioner provides an explanation, supported by the testimony of Mr. Donefer, for why a person of ordinary skill in the art would have had reason to combine Pictet’s teachings and arrive at the method of proposed substitute claim 13. *Id.* at 24–25 (citing Ex. 1031, 716–723; Ex. 1038 ¶¶ 52–58, 75–77). Petitioner argues that a person of ordinary skill in the art “would have recognized that Pictet’s data collection and storage steps (i.e., steps (a)-(c)) provide inputs for the subsequent calculations (i.e., steps (d)-[(e)]),” “would have understood Pictet as teaching that the distributed parallel processing . . . applies to the implementation of the trading models performing those calculations,” and would have had “reason to use at least five of the parameters discussed [in Pictet] when configuring the rules governing the ‘grand’ model.” *Id.* at 24. Petitioner further contends that

numerous types of parameters were routinely used when designing and evaluating trade models, and Pictet’s moving average . . . is no different. Moreover, Pictet describes two categories of threshold values (i.e., trend and overbought/oversold) and expressly teaches using “several threshold values of both types,” which at a minimum suggests four such parameters. The voting scheme is also an integral part of the weighted moving average Pictet describes. A [person of ordinary skill in the art] also had reason to incorporate a time parameter setting the amount of time in the past that is considered, since a [person of ordinary skill in the art] would have understood that price data from the distant past is less

984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that “the Board need not address issues that are not necessary to the resolution of the proceeding”).

relevant to a moving average. Pictet also teaches using stop-loss and stop-profit parameters as part of its model implementation. *Id.* at 24–25 (citations omitted). We have reviewed Petitioner’s analysis and find it persuasive. Petitioner’s reasoning is consistent with the disclosure of Pictet and supported by the testimony of Mr. Donefer, which we credit. For the reasons stated by Petitioner and Mr. Donefer, we find that a person of ordinary skill in the art would have had reason to combine the cited teachings of Pictet in the manner asserted with a reasonable expectation of success.

Petitioner has proven, by a preponderance of the evidence, that proposed substitute claim 13 would have been obvious based on Pictet under 35 U.S.C. § 103(a).

III. CONCLUSION¹⁵

Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–12 of the ’534 patent are unpatentable as claiming patent-ineligible subject matter under 35 U.S.C. § 101. With respect to Patent Owner’s Revised Motion to Amend, Petitioner has demonstrated, by a preponderance of the evidence, that proposed substitute claim 13 is unpatentable as

¹⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), 42.8(b)(2).

claiming patent-ineligible subject matter under 35 U.S.C. § 101 and obvious under 35 U.S.C. § 103(a). In summary:

Claims	35 U.S.C. §	References/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–12	101	Eligibility	1–12	
Overall Outcome			1–12	

Motion to Amend Outcome	Claim
Substitute Claims Proposed in the Motion to Amend	13
Substitute Claims: Motion to Amend Denied	13

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–12 of the '534 patent have been shown to be unpatentable; and

FURTHER ORDERED that Patent Owner's Revised Motion to Amend is *denied*.

This is a final decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

CBM2020-00023
Patent 7,496,534 B2

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