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Paper 45
Entered: January 21, 2025

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CRUSOE ENERGY SYSTEMS, LLC,
Petitioner,

v.

UPSTREAM DATA INC.,
Patent Owner.

PGR2023-00039
Patent 11,574,372 B2

Before HYUN J. JUNG, JAMES J. MAYBERRY, and MATTHEW S. MEYERS, *Administrative Patent Judges.*

MEYERS, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 328(a)

I. INTRODUCTION

A. Background and Summary

Crusoe Energy Systems, LLC ("Petitioner") filed a Petition (Paper 2, "Pet.") to institute post-grant review of claims 1–4, 7–12, 15–30, 34–37, and 40 ("the challenged claims") of U.S. Patent No. 11,574,372 B2 (Ex. 1001, "the '372 patent"). Upstream Data Inc. ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp."). With our authorization (Ex. 1101), Petitioner filed a Preliminary Reply to Patent Owner's Preliminary Response (Paper 12, "Prelim. Reply") to address § 325(d) issues raised in the Preliminary Response. Patent Owner filed a Preliminary Sur-reply thereto (Paper 13, "Prelim. Sur-reply"). On January 22, 2024, we instituted a post-grant review of the challenged claims on all grounds raised in the Petition. Paper 14 ("Institution Decision" or "Inst. Dec."), 59.

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 20, "PO Resp."), Petitioner filed a Reply to the Patent Owner Response (Paper 25, "Pet. Reply"), and Patent Owner filed a Sur-reply to Petitioner's Reply (Paper 33, "PO Sur-reply"). An oral hearing was held on October 25, 2024. A transcript of the hearing is included in the record. Paper 44 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 328(a) as to the patentability of the claims on which we instituted trial. Based on the complete record, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1 and 24 are unpatentable. We determine that Petitioner has not shown, by a preponderance of the evidence, that claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40 are unpatentable.

B. Real Parties in Interest

Petitioner identifies that Crusoe Energy Systems, LLC is the real party-in-interest. Pet. 124. Patent Owner indicates Upstream Data Inc. is the patent owner and real party-in-interest in this proceeding. Paper 4, 2.

C. Related Matters

The parties state that the '372 patent is at issue in *Upstream Data Inc. v. Crusoe Energy Systems LLC*, Case No. 1:23-cv-01252 (D. Colo.) (filed May 18, 2023). Pet. 124; Paper 4, 2.

D. The '372 patent

The '372 patent is titled "Blockchain Mine at Oil or Gas Facility." Ex. 1001, code (54). Figure 1, reproduced below, is a schematic of a system for power a blockchain mine at a remote oil well, using a generator.

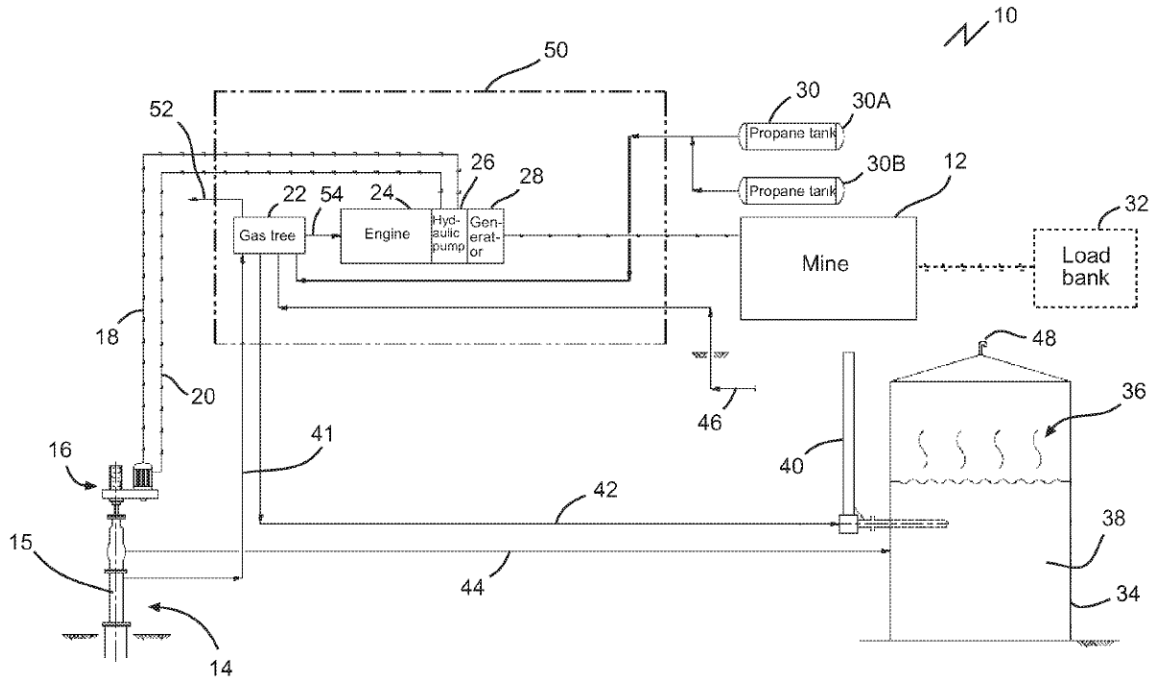

Figure 1 illustrates blockchain mining device 12, oil well 14, and generator 28. Ex. 1001, 8:35–40.

According to the ’372 patent, “[a]t remote oil and gas facilities, excess natural gas is often wasted, for example vented to atmosphere or burned via flaring.” Ex. 1001 at 1:11–13. The ’372 patent identifies that this is because “[i]n many locations it may not be economically feasible to build the infrastructure required to take the produced gas, or resultant electricity generated by combustion of the gas, to market.” *Id.* at 7:49–52. The ’372 patent discloses that the “cheaper the electricity the more reward the miner will receive relative to competition.” *Id.* at 13:20–21. The ’372 patent further discloses that reliance on “low-cost hydroelectric power” has led to a “centralization of blockchain miners in specific countries with abundant hydroelectric power.” *Id.* at 14:4–11. This, according to the ’372 patent, is counter to the idea of decentralization and distribution inherent in the blockchain model, so the ’372 patent identifies a “need to further decentralize BITCOIN™ and other blockchain mining through a more decentralized source of low-cost power.” *Id.* at 14:13–20. To this end, the ’372 patent describes positioning a generator and blockchain mining device “at a suitable location relative to the hydrocarbon well, storage site, or processing facility,” such as located adjacent to a remote oil well. *Id.* at 9:14–19.

E. Challenged Claims

The ’372 patent includes 41 claims, and Petitioner challenges claims 1–4, 7–12, 15–30, 34–37, and 40. Of the challenged claims, claims 1 and 24 are independent. Claim 1 is illustrative and reads as follows[1]:

[1] We utilize Petitioner’s annotations. Pet. i.

[1pre] A system comprising:

[1a] a source of combustible gas produced from a facility selected from a group consisting of a hydrocarbon production, storage, or processing facility;

[1b] a generator connected to the source of combustible gas to receive a continuous flow of combustible gas to power the generator; and

[1c] blockchain mining devices connected to the generator; in which:

[1c_i] the blockchain mining devices each have a mining processor and are connected to a network interface;

[1c_ii] the network interface is connected to receive and transmit data through the internet to a network that stores or has access to a blockchain database;

[1c_iii] the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database;

[1c_iv] the network is a peer-to-peer network;

[1c_v] the blockchain database is a distributed database stored on plural nodes in the peer-to-peer network; and

[1c_vi] the blockchain database stores transactional information for a digital currency.

Ex. 1001, 19:52–20:7.

F. Prior Art and Instituted Grounds of Unpatentability

We instituted trial based on all asserted claims and grounds of unpatentability as follows:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 8, 16–30, 34	103[2]	Dickerson,[3] CryptoKube,[4] Szmigielski,[5] and Kheterpal[6]
1–4, 8, 10–12, 15–30, 34–37, 40	103	Dickerson, CryptoKube, Belady-989,[7] Szmigielski, and Kheterpal
1–4, 7–12, 15–30, 34–37, 40	103	Dickerson, CryptoKube, Belady-989, Boot,[8] Szmigielski, and Kheterpal

[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. § 103. Because the challenged claims of the '372 patent have an effective filing date (Feb. 8, 2017) after the effective date of the applicable AIA amendments, we refer to the AIA version of 35 U.S.C. § 103 in this Decision. *See* Ex. 1001, code (22).
[3] Dickerson, WO 2015/123257 A1, pub. Aug. 20, 2015 (Ex. 1005).
[4] "Launch your own Bitcoin Data Center," (last retrieved July 17, 2023 at https://web.archive.org/web/20160305044934/http://www.cryptokube.com:80/home/4586398583) (Ex. 1006, "CryptoKube"). Petitioner also references "CryptoKube Bitcoin Mining Data Center Tour" video, (last retrieved November 28, 2023 at https://web.archive.org/web/20150511223850/https://www.youtube.com/watch?v=5bDtgIcVb3s) (Ex. 1007, "CryptoKube video"; transcription in Ex. 1008).
[5] Szmigielski, Albert, "Bitcoin Essentials," Packt Publishing Ltd., Birmingham, UK, ISBN 978-1-78528-197-6, February 2016 (Ex. 1009).
[6] Kheterpal et al., US 2016/0125040 A1, pub. May 5, 2016 (Ex. 1010).
[7] Belady, et al., WO 2015/072989 A1, pub. May 21, 2015 (Ex. 1011).
[8] Boot, et al., US 9,394,770 B2, iss. July 19, 2016 (Ex. 1012).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 8, 16–22, 24–30, 34	103	MAGS,[9] Polivka,[10, 11] Szmigielski, and Kheterpal
1–4, 8, 10–12, 15–30, 34–37, 40	103	MAGS, Polivka, Belady-989, Szmigielski, and Kheterpal
1–4, 7–12, 15–30, 34–37, 40	101[12]	Eligibility

Pet. 3; Inst. Dec. 59.

Petitioner relies on the declarations of Michael Nikolaou, Ph.D. (Ex. 1003) and Vernon Kasdorf (Ex. 1004) in support of its contentions. Petitioner also relies on the second declarations of Dr. Nikolaou (Ex. 1035) and Mr. Kasdorf (Ex. 1036) in support of its arguments.

Patent Owner submits a first declaration of Fengqi You, Ph.D. (Ex. 2001) in support of its Preliminary Response and a second declaration of Dr. You in support of its Response (Ex. 2010). Patent Owner also submits a declaration of Stephen Barbour, the majority owner, President and CEO of Upstream Data Inc. (Ex. 2011).

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[9] "Gas Conversion Systems Reclaim Fuel for Industry," Spinoff 2015, National Aeronautics and Space Administration, Technology Transfer Program, pp. 104–107 (last retrieved Nov. 28, 2023 at https://spinoff.nasa.gov/Spinoff2015/ee_3.html) (Ex. 1013).

[10] "Mining Container ~ 100kW by Polivka GmbH," Bitcoin Forum, (last retrieved June 29, 2023 at https://web.archive.org/web/20150520015416/https://bitcointalk.org/index.php?topic=948523.0;all) (Ex. 1015).

[11] Petitioner also cites to a video, "Polivka Mining Container Setup on Vimeo," in Ex. 1019 (last retrieved in July 2023 at https://vimeo.com/119105477). Pet. iv, 79; Ex. 1020, 11 (refers to video as Exhibit 1017).

[12] Petitioner omits listing its patent-eligibility challenge to claims 1–4, 7–12, 15–30, 34–37, and 40 in its summary of grounds presented. *See* Pet. 3.

Mr. Kasdorf was cross-examined. *See* Ex. 2022 (first deposition transcript of Mr. Kasdorf); Ex. 2024 (second deposition transcript of Mr. Kasdorf). Dr. You was cross-examined. *See* Ex. 1034 (deposition transcript of Dr. You). Mr. Barbour was also cross-examined. *See* Ex. 1033 (deposition transcript of Mr. Barbour).

II. ANALYSIS

A. Principles of Law

"In [post grant review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (addressing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")); *compare* 35 U.S.C. § 312(a)(3), *with* 35 U.S.C. § 322(a)(3) (providing the same requirement for post grant reviews). Petitioner bears the burden of persuasion to prove unpatentability of each challenged claim by a preponderance of the evidence. 35 U.S.C. § 326(e). This burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

1. Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, "would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103. The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any

differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, any objective evidence of obviousness or non-obviousness.[13] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). "While the sequence of these questions might be reordered in any particular case" (*KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007)), the Federal Circuit has explained that an obviousness determination can be made only after consideration of all of the *Graham* factors. *See, e.g.*, *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012).

The Supreme Court made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. "[O]bviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine" teachings from multiple references. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); *see also PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1196 (Fed. Cir. 2014) ("The presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact.").

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

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[13] The parties do not present objective evidence of non-obviousness. *See* Pet. 80; *see generally* PO Resp.; PO Sur-reply.

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Best Med. Int'l, Inc. v. Elekta Inc.*, 46 F.4th 1346, 1353 (Fed. Cir. 2022) (citations omitted). "The patent's purpose can also be informative." *Id.* (citation omitted).

Petitioner asserts that one of ordinary skill in the art ("POSITA") would have had "a degree in chemical engineering, petroleum engineering, process engineering, mechanical engineering, or a similar field with 1–2 years of experience in designing power generation systems, Blockchain mining systems, or other comparable hands-on experience." Pet. 7 (citing Ex. 1003 ¶ 19). Petitioner adds that "[a]lternatively, a person having 3–5 years of experience in the Blockchain mining industry would also qualify as a POSITA" and "[a]dditional education could substitute for professional experience, or vice versa." *Id.* at 7–8 (citing Ex. 1003 ¶ 19).

In its Preliminary Response, Patent Owner disagreed with Petitioner's articulation of the level of ordinary skill in the art, but did not offer a definition of its own. Prelim. Resp. 9–10. In our Institution Decision, we applied Petitioner's definition of the level of skill in the art, as reproduced

above. At that time, we determined that this definition was consistent with the prior art of record and the skill reflected in the Specification of the '372 patent. Inst. Dec. 17–18. In its Response, Patent Owner does not offer its own definition, but instead, states that it "applied Petitioner's articulation and confirmed [that] the prior art analysis . . . would not change based on disagreements over the level of ordinary skill in the art." PO Resp. 9 (citing Ex. 2010 ¶ 17); *see also* Tr., 37:6–11 (acknowledging that Patent Owner's arguments do not turn on the definition of the level of skill in the art).

Based on the arguments presented and the cited references, we find Petitioner's proffered definition of the level of ordinary skill reasonable, supported by the prior art evidence, the Specification, and Dr. Nikolaou's declaration testimony (Ex. 1003 ¶ 19), and, to the extent necessary for purposes of this Decision, we adopt it as our own.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.200(b) (2024). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been 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*, 415 F.3d at 1312–13. "In determining the meaning of the 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) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner proposes constructions for four claim terms, "blockchain mining device," "mining processor," "a continuous flow of combustible gas," and "sales gas line." Pet. 4–7; *see also* Pet. Reply 1–4 (discussing "blockchain mining devices," "mining processor," "a continuous flow of combustible gas").

Patent Owner does not necessarily agree with Petitioner's constructions (PO Resp. 4–8), but states that it "applied Petitioner's proposed claim constructions when analyzing the prior art and confirmed that the analysis would not change regardless of which proposed constructions are applied" (*id.* at 9).

For purposes of this Decision, and based on the complete record before us, we determine that no terms need to be construed to resolve the parties' disputes. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Alleged Obviousness over Dickerson, CryptoKube, Szmigielski, and Kheterpal (Ground 1: Claims 1–4, 8, 16–30, and 34)

Petitioner asserts that claims 1–4, 8, 16–30, and 34 are unpatentable as obvious over Dickerson, CryptoKube, Szmigielski, and Kheterpal. Pet. 12–48. Petitioner also relies on the declaration testimony of Dr. Nickolaou and Mr. Kasdorf to support its arguments. *Id.* (citing Exs. 1003, 1004). Patent Owner contends that Petitioner has failed to demonstrate how the asserted prior art discloses certain claim limitations. *See* generally PO Resp; PO Sur-reply.

We have reviewed the Petition, Patent Owner Response, Petitioner Reply, Patent Owner Sur-reply, as well as the relevant evidence discussed in those papers and other record papers, and as discussed in greater detail below, we are not persuaded that the record establishes by a preponderance of the evidence Petitioner's contentions that claims 1–4, 8, 16–30, and 34 would have been obvious over Dickerson, CryptoKube, Szmigielski, and Kheterpal. Claim 1 requires, in pertinent part, "[1c_i] the blockchain mining devices each have a mining processor and are connected to a network interface" and "[1c_iii] the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database." Ex. 1001, 19:61–62, 19:66–20:2. Independent claim 24 recites the same limitations. *Id.* at 21:59–60, 21:64–67.

Below, we focus our analysis on these limitations. First, we summarize Dickerson, CryptoKube, Szmigielski, and Kheterpal, and then provide Petitioner's contentions and Patent Owner's response regarding these limitations. Finally, we provide our analysis and explanation as to why we determine that CryptoKube fails to disclose or suggest these limitations, and thus, the combination of Dickerson, CryptoKube, Szmigielski, and Kheterpal does not render obvious the subject matter of claims 1–4, 8, 16–30, and 34.

1. Overview of the Prior Art for Ground 1

a) Dickerson (Ex. 1005)

Dickerson is directed to "processing and using raw natural gas that is normally flared at the site of oil and gas field operation facilities." Ex. 1005 ¶ 2. Dickerson's Figure 1, which is reproduced below, illustrates "a

schematic view of a combined gas conditioning and power generation system." *Id.* ¶ 8.

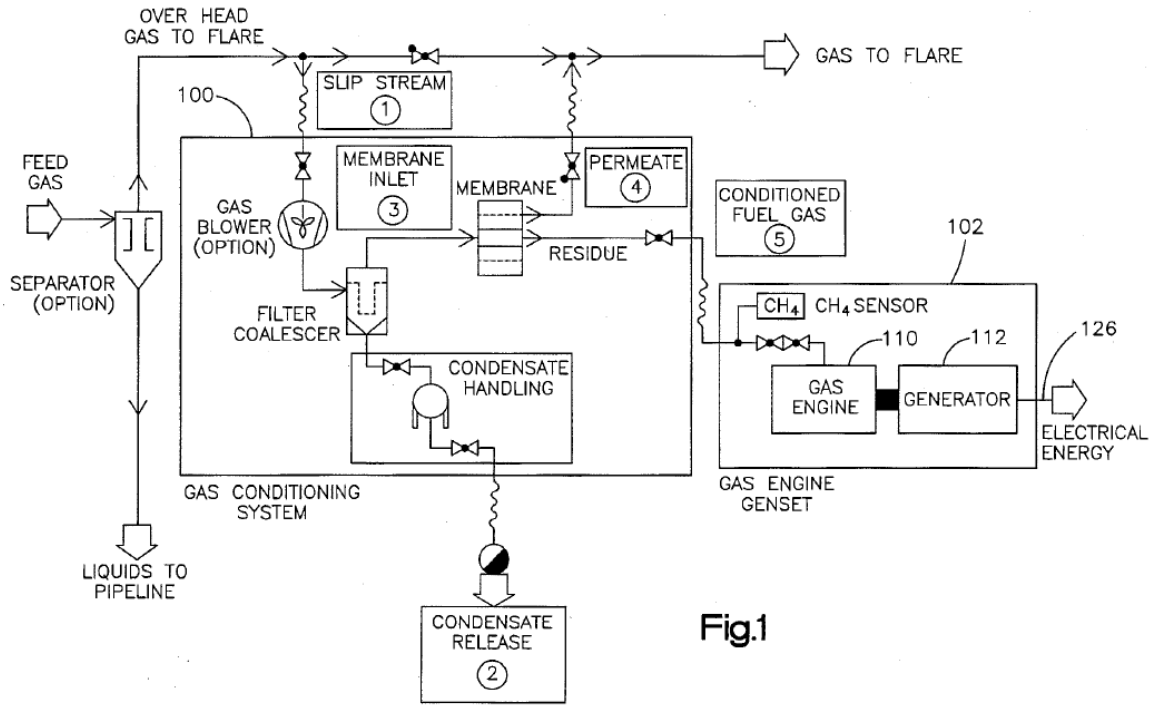

Figure 1 depicts a feed gas feeding into gas conditioning unit 100, which supplies gas to gas engine genset 102, which includes gas engine 110 and generator 112 to provide electrical energy via cable 126. Ex. 1005 ¶ 26.

Dickerson discloses that "large amounts of raw natural gas are flared because of the lack of gas pipeline takeaway capacity." Ex. 1005 ¶ 3. Dickerson also discloses that "a number of oil and gas field facilities where gas is being flared rely on diesel-powered electrical generating units for electricity needed to run the facilities." *Id.* ¶ 4. As an alternative, Dickerson discloses that its apparatus may be delivered "to an oil or gas production facility, connecting and operating the apparatus while the facility is generating raw natural gas." *Id.* ¶ 7. Dickerson's apparatus includes a "membrane separation unit for separating useful fuel gas from raw natural gas produced at an oil or gas production facility," because of the presence "of contaminants and uneven qualities, the raw natural gas is often

unsuitable for use in electric power generators." *Id.* ¶¶ 4, 6. The apparatus also includes "a gas engine that uses the fuel gas to generate electricity that is returned to the facility." *Id.* ¶ 6.

b) CryptoKube (Ex. 1006–1008)

CryptoKube[14] products include a variety of "entry level data center" models for the small or medium-sized industrial bitcoin miner or investor. Ex. 1006, 1–2.[15] The data-centers include an enclosure, cooling, internal power distribution, and are ready for the introduction of computers for use in bitcoin mining or investing. *Id.* The models are designed to be built and delivered so that the buyer need only hook up electrical service to the unit, because "[e]verything you need is already inside and ready to go." *Id.* ("JUST ADD POWER!").

c) Szmigielski (Ex. 1009)

Szmigielski is a book titled "Bitcoin Essentials." Ex. 1009, Title Page.[16] Szmigielski describes aspects related to the mining of Bitcoin, including instructions on how to mine bitcoin, how transactions are recorded on the blockchain, and also discusses the pros and cons of mining using CPUs, GPUs, FPGAs, and ASICs. *Id.* at v. Szmigielski explains bitcoin wallets (pages 1–14), mining software (pages 14–24), and other aspects of mining (pages 25–107). *Id.* at i–iv.

Szmigielski identifies that Application Specific Integrated Circuits (ASICs) "are microprocessors built for a single purpose. In the case of

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[14] Petitioner references all of Exhibits 1006–1008 collectively as "CryptoKube," in that each Exhibit documents various aspects of the CryptoKube product.
[15] We reference Petitioner's pagination in this reproduction of a web page.
[16] We refer to the original pagination, rather than Petitioner's.

Bitcoin mining, they are built to perform the SHA-256 hash function that is used in Bitcoin." Ex. 1009, 61. Szmigielski describes the computing power and resources needed to accomplish mining outcomes, and notes that "costs can add up quickly and electricity is a big part of it. It is very important to set up your mining operation where electricity is cheap or perhaps even free." *Id.* at 71. Szmigielski describes that it is a benefit to mine bitcoin at a location with low electricity rates and a cooler climate. *Id.* at 72. This is because "[o]ne of the biggest costs for Bitcoin miners is the cost of electricity." *Id.* at 90.

d) Kheterpal (Ex. 1010)

Kheterpal is a patent application publication titled "Digital Currency Mining Circuitry Having Shared Processing Logic," which relates to mining digital currencies. Ex. 1010, code (54), ¶ 2. Kheterpal describes an exemplary digital currency, Bitcoin, which is governed by the Bitcoin protocol, in which a "network maintains a public ledger in which new transactions are verified and recorded by members of the network via cryptography." *Id.* ¶ 4. Kheterpal discloses that "[t]he Bitcoin protocol defines a system in which the creation and distribution of the bitcoin cryptocurrency is governed by consensus among a peer-to-peer network." *Id.*

Kheterpal discloses that "Bitcoin mining operations involve identifying a solution to a cryptographic puzzle in which transactions that are to be verified form part of the puzzle parameters." Ex. 1010 ¶ 5. Kheterpal further discloses that "Bitcoin mining operations are typically performed via brute-force techniques," where the "difficulty of the cryptographic puzzle has led to the use of dedicated circuitry designed specifically for Bitcoin mining." *Id.*

Figure 2, reproduced below, illustrates a schematic of Kheterpal's device.

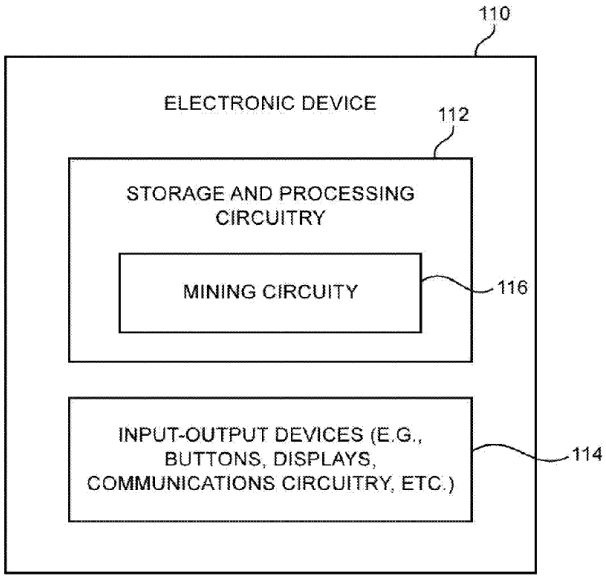

Figure 2 depicts Kheterpal's electronic device 110, which includes storage and processing circuitry 112, which itself includes mining circuitry 116. Ex. 1010 ¶ 32.

2. Petitioner's Contentions for Claim 1[17]

We use Petitioner's notations to identify the relevant claim elements. *See* Pet. 23–25.

a) [1c_i] the blockchain mining devices each have a mining processor and are connected to a network interface;

Petitioner asserts that CryptoKube's shipping container "is filled with spondooliestech SP35 servers, that is, blockchain mining devices, each necessarily having a mining processor." Pet. 23 (citing Ex. 1006, 1–4). Petitioner further asserts that CryptoKube's system includes an Internet firewall and routers. *Id.* (citing Ex. 1006, 4; Ex. 1023, 00:00:11).

[17] Petitioner provides similar detailed analysis for claim 24. *See* Pet. 42–44 (citing Ex. 1003).

According to Petitioner, one of ordinary skill in the art "would have understood that to mine digital currency, the miners need to be connected to a network interface (e.g., a modem or a router) in order to access a distributed, blockchain database that is shared across a network." *Id.* at 24 (citing Ex. 1004 ¶¶ 104–105).

b) [1c_iii] the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database;

Petitioner asserts that CryptoKube's system includes "Bitcoin miners such as spondooliestech SP35 servers." Pet. 25 (citing Ex. 1006, 1–4). According to Petitioner, one of ordinary skill in the art

> would have understood that to mine Bitcoin, the mining processors need to be connected to a network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database, which is implemented as a public ledger distributed among many peer-to-peer devices connected to the Internet.

Id. (citing Ex. 1004 ¶¶ 108–109; Ex. 1010 ¶ 4).

3. Patent Owner's Response

Patent Owner argues that "the Petition clearly identifies 'spondooliestech SP35 servers' as the claimed 'blockchain mining devices'" (PO Resp. 41), but "fail[s] to identify a specific component that is the alleged 'mining processor.'" *Id.* at 42 (citing *Microsoft Corp. v. FG SRC, LLC*, 860 Fed. App'x 708, 713 (Fed. Cir. 2021); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). More particularly, Patent Owner contends that neither Petitioner nor Mr. Kasdorf explains or "cite[s] any evidence regarding which component is the 'necessarily' present mining processor (limitation *1[c_i]*) or how this

unspecified mining processor is 'connected to the network interface and adapted to . . . communicate with the blockchain database'" (limitation *1[c_iii]*)." *Id.* at 42–43 (citing Ex. 1004 ¶¶ 104–105, 108–109). According to Patent Owner, it was not until Mr. Kasdorf's deposition that Mr. Kasdorf identified "an ASIC chip in a spondooliestech server" as being "the Petition's 'necessarily' present 'mining processor.'" *Id.* at 43–44 (citing Ex. Ex. 2022, 59:9–60:16; Pet. 23; Ex. 1004 ¶ 104). Patent Owner argues, however, that that even if we were to accept Petitioner's belated allegation that "an ASIC chip" is the necessarily present "mining processor," referred to by Petitioner with respect to limitation *1[c_i]* (*see* Pet. 23 (citing Ex. 1006, 1–4), "an ASIC chip in a spondooliestech server does not meet the 'connected to the network interface and adapted to . . . communicate with the blockchain database' limitations in element *1[c_iii]*." PO Resp. 44–45 (citing Ex. 2010 ¶ 106).

4. Petitioner's Reply

In reply to Patent Owner's arguments, Petitioner contends that it identified that CryptoKube's "blockchain mining devices**, each necessarily having a mining processor**," and as such, "the Petition explained that the 'mining processor' is a subpart of the Spondoolies, and Mr. Kasdorf explained that this subpart can be an ASIC chip." Pet. Reply 10 (citing Ex. 2022, 59:9–60:16). Petitioner argues alternatively that "[e]ven under [Patent Owner's] overly narrow and incorrect view that claim 1 requires the 'mining processor' to perform the communication functions, a combination of an ASIC chip and a controller would meet the 'mining processor' limitation." Pet. Reply 11 (citing Ex. 1036 ¶ 21).

5. Patent Owner's Sur-reply

Patent Owner contends the Reply "does not cure Petitioner's failure to identify the claimed 'mining processor' in the Petition" nor does it "show that the prior art ASIC chip discloses limitation 1[c_iii]." PO Sur-reply 1. Patent Owner further contends that Petitioner's "brand-new theory that 'a combination of an ASIC chip and a controller would meet the "mining processor" limitation'" is improper because it was not disclosed in the Petition. PO Sur-reply 3–4 (citing Pet. Reply 11).

6. Analysis of Claims 1 and 24[18]

We have considered Petitioner's arguments and evidence, and Patent Owner's counterarguments and find, on the complete trial record, that Petitioner does not demonstrate, by a preponderance of the evidence, that the combination of Dickerson, CryptoKube, Szmigielski, and Kheterpal teaches or suggests "the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database," as recited by limitation [1c_iii] of claim 1.

To address the claimed "mining processor," Petitioner asserts that CryptoKube's shipping container "is filled with spondooliestech SP35 servers, that is, blockchain mining devices, each necessarily having a mining processor." Pet. 23 (citing Ex. 1006, 1–4; Ex. 1004 ¶¶ 104–105). Mr. Kasdorf's declaration testimony makes the same assertion with no additional explanation regarding what particularly constitutes a "mining processor." *See, e.g.*, Ex. 1004 ¶ 104 (citing Ex. 1006, 1–4) ("The CryptoKube is built

[18] Patent Owner argues independent claims 1 and 24 together.

inside an ISO shipping container and is filled with spondooliestech SP31 OR SP35 servers, that is, blockchain mining devices, each necessarily having a mining processor."); ¶ 105 (concluding that one of ordinary skill in the art "would have understood that CryptoKube meets this limitation").

To address that "the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database," as recited by limitation [1c_iii], Petitioner asserts that CryptoKube's system includes "Bitcoin miners such as spondooliestech SP35 servers." Pet. 25 (citing Ex. 1006, 1–4). And, relying on the declaration testimony of Mr. Kasdorf, Petitioner concludes that one of ordinary skill in the art

> would have understood that to mine Bitcoin, the mining processors need to be connected to a network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database, which is implemented as a public ledger distributed among many peer-to-peer devices connected to the Internet.

Id. (citing Ex. 1004 ¶¶ 108–109; Ex. 1010 ¶ 4[19]). Mr. Kasdorf's declaration testimony is nearly verbatim to the Petition and similarly provides no indication as to what in CryptoKube constitutes a "mining processor" other than his conclusory opinion that one of ordinary skill in the art "would have understood that to mine bitcoin, the mining processors need to be connected to a network interface and adapted to mine transactions associated with the

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[19] We note that Mr. Kasdorf's reliance on Kheterpal is limited to Kheterpal's background discussion regarding the Bitcoin protocol inasmuch as it "defines a system in which the creation and distribution of the bitcoin cryptocurrency is governed by consensus among a peer-to-peer network" and includes "a public ledger in which new transactions are verified and recorded by members of the network via cryptography." Ex. 1010 ¶ 4.

blockchain database and to communicate with the blockchain database." Ex. 1004 ¶ 108 (citing Ex. 1010 ¶ 4). Thus, we agree with Patent Owner that in the Petition, neither Petitioner nor Mr. Kasdorf explains or "cite[s] any evidence regarding which component is the 'necessarily' present mining processor (limitation *1[c_i]*) or how this unspecified mining processor is 'connected to the network interface and adapted to . . . communicate with the blockchain database' (limitation *1[c_iii]*)." PO Resp. 42–43 (citing Ex. 1004 ¶¶ 104–105, 108–109).

Petitioner responds that the Petition identified that CryptoKube's "blockchain mining devices**, each necessarily having a mining processor**," and as such, "the Petition explained that the 'mining processor' is a subpart of the Spondoolies, and Mr. Kasdorf explained that this subpart can be an ASIC chip." Pet. Reply 10 (citing Ex. 2022, 59:9–60:16). In addition, Petitioner argues that "[t]o enable mining, the ASIC chip is necessarily connected to the network interface, and adapted to exchange[] data (i.e., communicates)[] with the blockchain database." *Id.* (citing Ex. 1033, 204:5–12, 207:22–208:5; Ex. 1034, 34:6–9, 197:1–10, 199:23–200:1) (footnote omitted). Thus, Petitioner maintains that "this limitation is necessarily met by the ASIC chip in the Spondoolies." *Id.*

At least one difficulty with Petitioner's response is that even if we were to accept Petitioner's recent allegation in its Reply that "an ASIC chip" is the necessarily present "mining processor," referred to by Petitioner with respect to limitation 1[c_i] (*see* Pet. 23 (citing Ex. 1006, 1–4), we agree with Patent Owner that, by itself, "an ASIC chip in a spondooliestech server does not meet the 'connected to the network interface and adapted to . . . communicate with the blockchain database' limitations recited in element 1[c_iii]." PO Resp. 44–45 (citing Ex. 2010 ¶ 106). In making this

determination, we credit the declaration testimony of Dr. You who opines that one of ordinary skill in the art "would not understand an ASIC integrated circuit in a spondooliestech or similar prior art ASIC mining server to be 'connected to the network' or 'adapted . . . to communicate with the blockchain database' as claimed." Ex. 2010 ¶ 111.

According to Dr. You, "mining was the *only* activity performed by ASIC chips such as those in spondooliestech SP35 and similar ASIC mining servers known at the time of the invention and used in miners such as CryptoKube." *Id.* ¶ 109 (citing Ex. 1001, 17:15–21; Ex. 2022, 61:1–7). And, relying on the declaration testimony of Dr. You, Patent Owner asserts that "[n]etwork connection and communication with the blockchain database was handled by other components in ASIC mining servers known at the time of the invention." PO Resp. 46 (citing Ex. 2010 ¶ 110). To support its assertion, Patent Owner and Dr. You direct our attention to the '372 patent's Specification. PO Resp. 45–50; PO Sur-reply 3.

The '372 patent's Specification discloses that "[e]ach mining processor 92 may have a variety of configurations, but generally may include at least a power supply, a controller board and mining circuitry, such as an ASIC circuit." Ex. 1001, 17:9–12. More particularly, the'372 patent's Specification identifies that

> [t]he components of an ASIC mining processor include the hash boards (each board has numerous chips that is doing the hashing), a controller (to communicate with the network and optimize the mining processors chip frequency and fans for cooling), and a power supply (typically converts AC input power to DC power for the ASIC).

Id. at 17:15–21. During deposition testimony, Mr. Kasdorf confirmed, that according to the '372 patent's Specification, it is "the ASIC integrated

circuit [that] is doing the mining while this other component called 'controller' is connected to the network interface and communicating with the network." Ex. 2022, 65:14–20. Thus, we agree with Patent Owner that "the ASIC chip described in the '372 specification only performs mining while the ASIC mining processor's controller (EX1001, 17:15–21) is responsible for network connection and communication with the network comprising a blockchain database." PO Resp. 48.

Petitioner responds that "[t]o enable mining, the ASIC chip is necessarily connected to the network interface, and adapted to exchange[] data (i.e., communicates)[] with the blockchain database." Pet. Reply 10 (citing Ex. 1033, 204:5–12, 207:22–208:5; Ex. 1034, 34:6–9, 197:1–10, 199:23–200:1) (footnote omitted). Thus, Petitioner maintains that limitation [1c_iii] "is necessarily met by the ASIC chip in the Spondoolies." *Id.* However, we agree with Patent Owner that the record demonstrates sufficiently that "there is no support for Petitioner's assertion that 'this limitation is necessarily met by the ASIC chip.'" PO Sur-reply 3 (citing Pet. Reply 10).

Again, we credit Dr. You's declaration testimony that "mining was the *only* activity performed by ASIC chips such as those in spondooliestech SP35 and similar ASIC mining servers known at the time of the invention and used in miners such as CryptoKube." Ex. 2010 ¶ 109 (citing Ex. 1001, 17:15–21; Ex. 2022, 61:1–7). To support his position, Dr. You directs our attention to Szhmigielski's disclosure that ASICs are "'microprocessors built for a single function,' that is 'to perform the SHA-256 hash function that is used in Bitcoin.'" Ex. 2010 ¶ 112 (quoting Ex. 1009, 61). During deposition testimony, Petitioner's declarant, Mr. Kasdorf confirmed that a Spondoolies SP 31 or SP35 would operate with this same distribution of

functionality (i.e., "the ASIC integrated circuit is doing the mining while this other component called 'controller' is connected to the network interface and communicating with the network"). *See* Ex. 2022, 65:14–66:3.

We agree with Patent Owner that Petitioner mischaracterizes Mr. Barbour's deposition testimony (i.e., "an ASIC chip needs to be controlled and have access to up-to-date information on the network" (Ex. 1033, 207:1–3)) to support its position that "the ASIC chip is itself adapted to communicate with the blockchain database." PO Sur-reply 2 (citing Pet. Reply 10). We, instead, credit Mr. Barbour's explanation, during deposition, that "it is the mining server controller, and not the ASIC chip, that 'interfaces between a number of things, but including network communications, with a blockchain database, among other things.'" *Id.* (citing Ex. 1033, 205:9–19).

We also find Petitioner's reliance on Dr. You's deposition testimony that "'network connectivity is important and necessary,'" "'blockchain mining would require connections and communications with the blockchain database,'" and "'exchanging with the blockchain database will be necessary'" fails to supports its position that limitation [1c_iii] "is necessarily met by the ASIC chip in the Spondoolies." *See* Pet. Reply 10 (citing Ex. 1034, 34:6–9, 197:1–10, 199:23–200:1[20]). Instead, we agree with Patent Owner that just because "blockchain mining requires exchanging data with the blockchain database does not mean the ASIC itself is adapted for this function." PO Sur-reply 3. Based on the complete trial record, and for the reasons discussed, we find that Petitioner has not sufficiently

[20] Patent Owner notes that the correct citation is found at Ex. 1034, 198:23–199:1. PO Sur-reply 3, n.2.

demonstrated that one of ordinary skill in the art would have understood that "an ASIC integrated circuit in a spondooliestech or similar prior art ASIC mining server to be 'connected to the network' or 'adapted . . . to communicate with the blockchain database' as claimed." PO Resp. 49–50 (citing Ex. 2010 ¶ 112).

Petitioner argues alternatively that "[e]ven under [Patent Owner's] overly narrow and incorrect view that claim 1 requires the 'mining processor' to perform the communication functions, a combination of an ASIC chip and a controller would meet the 'mining processor' limitation." Pet. Reply 11 (citing Ex. 1036 ¶ 21). To support its position, Petitioner points out that Patent Owner's "expert admitted that the 'mining processor' in [Patent Owner's] products can be a subpart of the S9 miner." *Id.* (citing Ex. 1034, 211:23–213:19). Consequently, "[b]y the same rationale, the 'mining processor' in CryptoKube can also be a subpart of the Spondoolies (e.g., the combination of the ASIC chips and the controller)." *Id.* (citing Ex. 1036 ¶ 21).

Patent Owner responds arguing that Petitioner's "brand-new theory that 'a combination of an ASIC chip and a controller would meet the "mining processor" limitation'" is improper because it was not disclosed in the Petition. PO Sur-reply 3–4 (citing Pet. Reply 11). According to Patent Owner, "Petitioner attempts to premise it on the deposition testimony of PO's expert regarding a hypothetical 'subset' of an S9 miner." *Id.* at 4 (citing Ex. 1034, 213:1–19). And, with respect to Petitioner's argument that Patent Owner is incorrect that "'claim 1 requires the 'mining processor' to perform the communication functions'" (*id.* (citing Pet. Reply 11)), Patent Owner asserts that its position is based on the language of the plain language of limitation *[1c_iii]*, which recites that "the mining processors are

connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database" (*id.* at 4–5 (citing Ex. 1001, 19:66–20:2).

Based on the complete trial record, we agree with Patent Owner that Petitioner's contention that "a combination of an ASIC chip and a controller would meet the 'mining processor' limitation" (Pet. Reply 11 (citing Ex. 1036 ¶ 21)) is an improper new argument. In determining whether an argument is a proper argument in reply, we look to see if the Reply argument is responsive to an argument from Patent Owner and expands on a position in the Petition. *See Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1384 (Fed. Cir. 2023) ("[W]e have held that a reply may be proper if it is responsive and simply expands on previously raised arguments."). Or, if Petitioner relies on previously unidentified disclosure "to make a meaningfully distinct contention." *Id.* at 1383 ("[W]e held that a petitioner who asserted in its reply previously unidentified prior-art disclosures 'to make a meaningfully distinct contention' was impermissibly raising a new theory of unpatentability."). We find that Petitioner's argument in reply is closer to the later situation.

Here Petitioner does not expand on a position from the Petition that Patent Owner criticizes based on the merits of the contentions. Rather, Petitioner supplements its conclusory assertion that a "mining processor" is necessarily present in CryptoKube's spondooliestech SP35 servers (Pet. 23, 25 (citing Ex. 1006, 1–4)) with its new assertion that that "a combination of an ASIC chip and a controller would meet the 'mining processor' limitation." Pet. Reply 11. Petitioner does not purport to have presented this theory in the Petition. *Id.* Instead, Petitioner argues that this theory was properly raised in response to what Petitioner alleges to be an admission by

Patent Owner's declarant, Dr. You, during deposition "that the 'mining processor' in [Patent Owner]'s products can be a subpart of the S9 miner." *Id.* (citing Ex. 1034, 211:23–213:19).

However, we agree with Patent Owner that the portion of Dr. You's "cited testimony does not support the new theory because it was not about the controller" (PO Sur-reply 4 (citing Ex. 1034, 213:1–9)) or "prior art," but instead, about Patent Owner's own "products practicing the '372 patent for which [Patent Owner]'s expert considered the entire S9 miner as the 'mining processor.'" PO Sur-reply 4 (citing Ex. 2010 ¶¶ 76–87). Thus, we find Petitioner's response is the type of "meaningfully distinct contention" that signals that Petitioner is augmenting deficient contentions in the Petition with new arguments. *See Intelligent Bio-Sys.*, 821 F.3d at 1369 (citing 35 U.S.C. § 312(a)(3)) ("It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.'").

To the extent Petitioner argues that Patent Owner's position that "claim 1 requires the 'mining processor' to perform the communication functions" is "overly narrow and incorrect" (Pet. Reply 11), we do not find Petitioner's conclusory argument to be persuasive. Instead, we agree with Patent Owner that its position is based on the language of claim 1, i.e., "the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database." PO Sur-reply 4–5 (citing Ex. 1001, 19:66–20:2).

Accordingly, upon review of the information in the Petition and corresponding evidence, and Patent Owner's arguments and corresponding

evidence, we find that Petitioner has not proven, by a preponderance of the evidence, that the combination of Dickerson, CryptoKube, Szmigielski, and Kheterpal teaches or suggests the subject matter of independent claims 1 and 24.

7. Dependent Claims 2–4, 8, 16–23, 25–30, and 34

Petitioner asserts that claims 2–4, 8, 16–23, 25–30, and 34 (which depend from claims 1 and 24, respectively) are unpatentable as obvious over Dickerson, CryptoKube, Szmigielski, and Kheterpal. Pet. 26–42, 44–48.

For the reasons explained above in connection with independent claims 1 and 24, Petitioner does not persuasively show that the subject matter of claims 2–4, 8, 16–23, 25–30, and 34 is unpatentable as obvious over Dickerson, CryptoKube, Szmigielski, and Kheterpal.

8. Conclusion for Ground 1

Based on the analysis above, we conclude that Petitioner has not proven, by a preponderance of the evidence, that claims 1–4, 8, 16–30, and 34 are unpatentable under 35 U.S.C. § 103 over the combination of Dickerson, CryptoKube, Szmigielski, and Kheterpal.

E. Alleged Obviousness over Dickerson CryptoKube, Belady-989, Szmigielski, and Kheterpal (Ground 2) and Dickerson CryptoKube, Belady-989, Boot, Szmigielski, and Kheterpal (Ground 3)

Petitioner asserts that claims 1–4, 8, 10–12, 15–30, 34–37, and 40 are unpatentable as obvious over Dickerson, CryptoKube, Belady-989, Szmigielski, and Kheterpal (Pet. 48–64, Ground 2) and claims 1–4, 7–12, 15–30, 34–37, and 40 are unpatentable as obvious over Dickerson, CryptoKube, Belady-989, Boot, Szmigielski, and Kheterpal (*id.* at 64–70, Ground 3). For Grounds 2 and 3, Petitioner relies on CryptoKube to address limitations [1c_i] and [1c_iii] for the same reasons identified in Ground 1.

See Pet. 53–54 (mapping Ground 2); *id.* at 70 (mapping Ground 3).[21] Petitioner does not rely on the additional references to cure the underlying defect identified by Patent Owner with respect to of Petitioner's reliance on CryptoKube in Ground 1. *See* Pet. 52–53 (for Ground 2, relying on Ground 1 for limitations [1c_i] and [1c_iii]); *id.* at 70 (for Ground 3, relying on Ground 2 for limitations [1c_i] and [1c_iii]).

Patent Owner disputes Petitioner's showing for the same reasons discussed above in Ground 1. *See* PO Resp. 51, 55–56.

Accordingly, Petitioner has not shown by a preponderance of the evidence that claims 1–4, 8, 10–12, 15–30, 34–37, and 40 would have been obvious over Dickerson, CryptoKube, Belady-989, Szmigielski, and Kheterpal (Ground 2) and claims 1–4, 7–12, 15–30, 34–37, and 40 would have been obvious over Dickerson, CryptoKube, Belady-989, Boot, Szmigielski, and Kheterpal (Ground 3) for the same reasons set forth in Ground 1. *See* Section II.D. *supra*.

F. Alleged Obviousness over MAGS, Polivka, Szmigielski, and Kheterpal (Ground 4: Claims 1–4, 8, 16–22, 24–30, and 34)

Petitioner asserts that claims 1–4, 8, 16–22, 24–30, and 34 are unpatentable as obvious over MAGS, Polivka, Szmigielski, and Kheterpal. Pet. 77–99. Petitioner also relies on the declaration testimony of Dr. Nickolaou and Mr. Kasdorf to support its arguments. *Id.* (citing Exs. 1003, 1004). Patent Owner contends that Petitioner has failed to demonstrate how the asserted prior art discloses claim limitations [1c_i] and [1c_iii]. *See generally* PO Resp; PO Sur-reply.

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[21] Petitioner performs a similar analysis for independent claim 24. *See* Pet. 60–62 (mapping Ground 2); *id.* at 75–76 (mapping Ground 3).

We have reviewed the Petition, Patent Owner Response, Petitioner Reply, Patent Owner Sur-reply, as well as the relevant evidence discussed in those papers and other record papers, and as discussed in greater detail below, we are not persuaded that the record establishes by a preponderance of the evidence Petitioner's contentions that claims 1–4, 8, 16–22, 24–30, and 34 would have been obvious over MAGS, Polivka, Szmigielski, and Kheterpal. Claim 1 requires, in pertinent part, "[1c_i] the blockchain mining devices each have a mining processor and are connected to a network interface" and "[1c_iii] the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database." Ex. 1001, 19:61–62, 19:66–20:2. Independent claim 24 recites the same limitations. *Id.* at 21:59–60, 64–67.

Below, we focus our analysis on these limitations. First, we summarize MAGS and Polivka, and then provide Petitioner's contentions and Patent Owner's response regarding these limitations. Finally, we provide our analysis and explanation as to why we determine that Polivka fails to disclose or suggest these limitations, and thus, the combination of MAGS, Polivka, Szmigielski, and Kheterpal does not render obvious the subject matter of claims 1–4, 8, 16–22, 24–30, and 34.

1. Overview of MAGS (Ex. 1013)

MAGS is directed to a paper describing Pioneer Energy's Mobile Alkane Gas Separator (MAGS) system. Ex. 1013.[22] The MAGS system

[22] Petitioner contends that "[s]ome of the engineering details of MAGS" are described in US Patent Publication No. 2015/0368566 ("Young," Ex. 1014). Pet. 78.

discloses that its system

> separates flare gases that naturally occur at drilling sites into three streams: one can be captured in tanks and shipped off for sale, another powers generators that run the drilling operation, and a third powers MAGS itself. Pioneer sold its first MAGS unit in late 2014 to a company operating in North Dakota, where flare gases are most often simply burned onsite, the gases wasted.

Id. at 2.

2. Overview of Polivka (Ex. 1015)

Polivka discloses a shipping container that is adapted into a mobile crypto-currency miner. Ex. 1015, 1–35. Polivka discloses that it can be configured to carry various crypto-currency miners including Spondoolies-Tech SP31 and Bitmain Antminer S19. *Id.* at 15. Polivka identifies a desire for cheap electricity. *Id.* at 15, 21.

3. Petitioner's Contentions for Claim 1[23]

We use Petitioner's notations to identify the relevant claim elements. *See* Pet. 84–85.

a) [1c_i] the blockchain mining devices each have a mining processor and are connected to a network interface;

Petitioner asserts that Polivka's system "can carry various miners including Spondoolies-Tech SP31 and Bitmain Antminer S19." Pet. 84 (citing Ex. 1015, 17). According to Petitioner, one of ordinary skill in the art "would have found it obvious that the blockchain mining devices (e.g., Spondoolies-Tech SP31) each have a mining processor and are connected to

[23] Petitioner provides similar analysis for claim 24. *See* Pet. 96–97 (citing Ex. 1003).

a network interface (e.g., a modem or a router)." *Id.* (citing Ex. 1004 ¶¶ 306–307).

b) *[1c_iii] the mining processors are connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database;*

Petitioner asserts that Polivka's system "can carry various miners including Spondoolies-Tech SP31 and Bitmain Antminer S19." Pet. 85 (citing Ex. 1015, 17). According to Petitioner, one of ordinary skill in the art "would have understood that to mine digital currency, the mining processors need to be connected to the network interface and adapted to mine transactions associated with the blockchain database and to communicate with the blockchain database." *Id.* (citing Ex. 1004 ¶¶ 312–315; Ex. 1010 ¶ 4).

4. Arguments and Analysis

Patent Owner argues that "Petitioner's analysis of claim elements *[1c_i]* and *[1c_iii]* suffers from the same defects as Ground 1." PO Resp. 62. More particularly, Patent Owner argues that

> [i]f the "blockchain mining device" in this ground is a spondooliestech SP31 server (as alleged for limitation *[1c_i]*, Petition, 84), then, as with Ground 1, Petitioner must be relying on an ASIC chip in the server as the claimed "mining processor." In this case, as established in Ground 1, the ASIC chip (or a hashboard comprising multiple such chips) does not meet at least limitation *[1c_iii]* because it is not connected to the network interface and is not adapted to communicate with the blockchain database; instead, its only function is to hash.

PO Resp. 64 (citing Ex. 2010 ¶ 151).

Petitioner does not respond to Patent Owner's arguments addressing limitations [1c_i] and [1c_iii], as they pertain to Ground 4, but instead relies

on its response with respect to Ground 1. Pet. Reply 24 (citing *id.* at 9–11). In the absence of any argument directly related to Ground 4, we agree with Patent Owner that Petitioner has not adequately demonstrated that Polivka's ASIC chip "meet[s] at least limitation *[1c_iii]* because it is not connected to the network interface and is not adapted to communicate with the blockchain database; instead, its only function is to hash." PO Resp. 64 (citing Ex. 2010 ¶ 151). We also agree with Patent Owner that "[i]f the 'mining processor' is the spondooliestech server itself then some other devices must be the 'blockchain mining devices' of the claims," but neither Petitioner nor its declarants have identified that position with any particularly. *Id.* (citing *Intelligent Bio-Systems*, 821 F.3d at 1369).

Accordingly, Petitioner has not shown by a preponderance of the evidence that claims 1–4, 8, 16–22, 24–30, and 34 would have been obvious over MAGS, Polivka, Szmigielski, and Kheterpal for similar reasons as to those set forth in Ground 1. *See* Section II.D. *supra*.

G. Alleged Obviousness over MAGS, Polivka, Belady-989, Szmigielski, and Kheterpal
(Ground 5: Claims 1–4, 8, 10–12, 15–30, 34–37, and 40)

Petitioner asserts that claims 1–4, 8, 10–12, 15–30, 34–37, and 40 are unpatentable as obvious over MAGS, Polivka, Belady-989, Szmigielski, and Kheterpal. Pet. 99–112. However, for Ground 5, Petitioner relies on Polivka for the same reasons presented in Ground 4 to address limitations [1c_i] and [1c_iii]. *See* Pet. 101–102; *see also id.* at 110 (mapping claim 24). Petitioner does not rely on Belady-989 to cure the deficiencies identified above in Ground 4.

Patent Owner disputes Petitioner's showing for the same reasons discussed above in Ground 4. *See* PO Resp. 67.

Accordingly, Petitioner has not shown by a preponderance of the evidence that claims 1–4, 8, 10–12, 15–30, 34–37, and 40 would have been obvious over MAGS, Polivka, Belady-989, Szmigielski, and Kheterpal for the same reasons set forth in Ground 4. *See* Section II.F. *supra*.

H. 35 U.S.C. § 101 – Patent Eligibility (Ground 6: Claims 1–4, 7–12, 15–30, 34–37, and 40)

Petitioner asserts that the subject matter of claims 1–4, 7–12, 15–30, 34–37, and 40 is ineligible for patent protection under 35 U.S.C. § 101. Pet. 112–119; Pet. Reply 26–27. Petitioner also relies on the declaration testimony of Dr. Nickolaou to support its arguments. *Id.* (citing Ex. 1003). Patent Owner responds to Petitioner's assertions. PO Resp. 70–88 (citing Ex. 2010); PO Sur-reply 23–26.

1. Relevant Law

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, 67 (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 (1853))); 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.*

In January 2019, the U.S. Patent and Trademark Office (USPTO) published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("2019 Revised Guidance"); *see also October 2019 Update: Subject Matter Eligibility* (the "October 2019 Update").[24] Under the 2019 Revised 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)) ("Step 2A, Prong Two").

2019 Revised Guidance, 84 Fed. Reg. at 52–55.

[24] *Available at* https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf.

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look, under Step 2B, 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 2019 Revised Guidance, 84 Fed. Reg. at 52–56.

i. Claims 1 and 24[25]

b. Step 1

This part of the eligibility analysis evaluates whether the claim falls within any statutory category. Claim 1 recites a system, which is a machine

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[25] The parties argue claims 1 and 24 together as a group. *See, e.g.*, Pet. 118; PO Resp. 72 (arguing claims 1 and 24 together), 77 (arguing the challenged claims). We also discern no substantive differences between the independent claims for purposes of our patent eligibility analysis. As to any differences between the system of claim 1 and the method of claim 24, we note that

> the system claims are no different from the method claims in substance. The method claims recite the abstract idea implemented on a generic computer; the system claims recite a handful of generic computer components [and other generic machinery] configured to implement the same idea. This Court has long "warn[ed] ... against" interpreting § 101 "in ways that make patent eligibility 'depend simply on the draftsman's art.'"

Alice Corp. Pty. Ltd., 573 U.S. at 226 (alterations in original).

and thus also a statutory category of invention. Claim 24 recites a method and corresponding steps. Ex. 1001, 21:48–22:5. Claim 24, thus, falls within the process category.

c. Step 2A, Prong One

This part of the eligibility analysis evaluates whether the claim recites a judicial exception. A claim "recites" a judicial exception when the judicial exception is "set forth" or "described" in the claim. October 2019 Update 1.

Petitioner argues that the challenged claims are patent ineligible because the "'372 [p]atent centers around the abstract idea of using natural gas to power a blockchain mine" and "recite[s] nothing more than 'generic processes and machinery.'" Pet. 114 (citing Ex. 1001, Abstract; Ex. 1003 ¶¶ 522–524); Pet. Reply 26. Petitioner contends that the '372 patent identifies that "generating power from natural gas at [a] well site is not a new idea," and argues that the claimed invention may be characterized as being "directed to . . . the abstract idea of using such power for blockchain mining." Pet. 114 (citing Ex. 1001, 6:56–58, 10:27–29); *see also* Pet. Reply 26 (arguing "the claims of the '372 patent broadly cover not only systems drawing power from byproduct gas from oil wells, but also systems drawing power from primary product gas from gas wells, gas from sales gas lines, and even systems drawing power from the electric grid.").

In response, Patent Owner contends that Petitioner oversimplifies the claimed invention, and "ignores that the source of combustible gas for the recited generator in the '372 patent is not a residential gas line that can be turned-off without consequences; it is a hydrocarbon facility that continuously flows combustible gas used by the generator." PO Resp. 71 (citing Ex. 2010 ¶ 169). Patent Owner contends that "Petitioner also ignores that the mining of blockchain is energy intensive requiring multiple mining

processors among the recited blockchain mining devices." *Id.* Patent Owner argues that claim 1 "cannot be distilled down simply to 'using natural gas to power a blockchain mine.'" *Id.* at 73 (citing Pet. 113).

Instead, according to Patent Owner, claim 1 recites more "than simply the use of natural gas to power a blockchain mine"; it recites

> a generator capable of using a continuous flow of natural gas (including raw natural gas also known as casinghead gas) from a hydrocarbon production, storage or processing facility to electrically power mining processors within blockchain mining devices that connect to a network interface with access to a blockchain database storing transactions associated with digital currency.

Id. at 72 (citing Ex. 2010 ¶ 173). Patent Owner further argues that Petitioner's analysis is deficient because it "do[es] not attempt to apply the rubric outlined in the USPTO's § 101 guidance." *Id.* at 74–75.

We have reviewed Patent Owner's arguments and cited evidence and determine, on this complete record, that Petitioner provides sufficient arguments and evidence to support its assertion that claims 1 and 24 recite an abstract idea under Step 2A, Prong One.

Claim 1 recites a system comprising "a source of combustible gas produced from" "a hydrocarbon production, storage, or processing facility," "a generator," and "blockchain mining devices connected to the generator." Ex. 1001, 19:52–59. Claim 24 includes substantially similar recitations. *Id.* at 21:48–22:5. The '372 patent discloses "the source of gas the remote oil well 14 may be connected to produce a continuous flow of combustible gas to power the generator 28, for example by supply of combustible gas to a combustion engine 24 that is connected to drive the generator 28." *Id.* at 9:28–32. The '372 patent discloses further that "generator 28 may be any device that converts mechanical energy to electrical energy, such mechanical

energy being converted from energy of combustion of the combustible gas." *Id.* at 9:66–10:3.

To this end, the '372 patent simply describes that "generator 28 and blockchain mining device 12 may be positioned at a suitable location relative to the hydrocarbon well, storage site, or processing facility." Ex. 1001, 9:14–17; *see id.* at 9:17–22 (describing that generator 28 and blockchain mining device 12 may be located, for example within "one hundred meters," "one kilometer," or even "further distances away" from remote oil well 14.). The '372 patent then discloses that "mining device 12 may be powered by a generator 28 that is retrofitted, or already present, at a well site independent of the prime mover engine 24." *Id.* at 10:27–29.[26]

According to the '372 patent, excess natural gas is often wasted at remote oil and gas facilities by either venting the gas to the atmosphere or burning it via flaring. Ex. 1001 at 1:11–13. The '372 patent teaches that rather than wasting the excess natural gas, "[t]he oil well operator may attempt to capture the gas and consume it, for example as on-site fuel for equipment or for instrumentation pressure." *Id.* at 6:55–58. The '372 patent

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[26] According to Patent Owner, the '372 patent makes clear that "mining device 12" is comprised of several components "including 'a controller 86, network equipment 88 such as a modem and a network switch, . . . and one or more mining processors 92 such as processors 92A-E.'" PO Resp. 4 (citing Ex. 1001, 16:32–39, 17:23–29, 19:59–62; Ex. 2010 ¶ 40) (emphases omitted). The '372 patent discloses that [e]ach mining processor 92 may have a variety of configurations, but generally may include at least a power supply, a controller board and mining circuitry." Ex. 1001, 17:9–11. More particularly, the '372 patent discloses that the mining circuitry may "include CPU (central processing unit), GPU (graphics processing unit), FPGA (Field-Programmable Gate Array), and ASIC (application specific integrated circuit)." *Id.* at 17:12–15.

informs us that the "cheaper the electricity the more reward the miner will receive relative to competition." *Id.* at 13:20–21. And, according to the '372 patent, reliance on "low-cost hydroelectric power" has led to the "centralization of blockchain miners in specific countries with abundant hydroelectric power," which is counter to the blockchain model of decentralization. *Id.* at 14:4–20. Thus, we agree with Petitioner that claims 1 and 24 result in a system and method that is broadly directed to the abstract idea of "using natural gas to power a blockchain mine." *See* Pet. 114. Without more, we find that the idea and practice of capturing otherwise wasted energy in order to generate an inexpensive supply of power, and thus drive profitability may be fairly characterized as a "fundamental economic practice": to find a low-cost supply of resources in producing a product, so as to increase profit. Such a "fundamental [and] long prevalent" practice has been held to be an abstract idea. *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1314 (Fed. Cir. 2016) (quoting *Alice*, 573 U.S. at 219). *See also* Ex.1001, 14:6–7 (describing that "low-cost hydroelectric power has become prevalent"); Ex. 1005 ¶ 5 ("Membrane-based separation of components of raw natural gas, such as the separation of methane from heavier hydrocarbons such as propane and butane, is well-known in the art. In this way, components of a natural gas stream, in particular methane gas, can be isolated and used as a fuel."); Ex. 1009, 90 (explaining that "the biggest industrial Bitcoin mine is located in eastern Washington state due to the abundance of inexpensive hydroelectric power"); Ex. 1011 ¶ 4 (explaining that "data centers are being located in areas where the data centers can obtain electrical power in a cost-effective manner," identifying that "natural gas is a byproduct of oil drilling operations [that] is often considered a waste byproduct since it cannot be economically captured and

brought to market," and discussing how "natural gas can be utilized to generate electrical power" to power the computing devices of a data center).

Claim 1 further recites that the "blockchain mining devices" "connected to the generator" each include "a mining processor" that is "connected to a network interface" in order to "receive and transmit data" with "a blockchain database" through the Internet. Ex. 1001, 19:59–65. Claim 1 recites that the "mining processors" are adapted to "mine transactions associated with the blockchain database," and then subsequently "store transactional information for a digital currency." *Id.* at 19:66–20:7. Claim 24 includes substantially similar recitations. *Id.* at 21:48–22:5. This collection and manipulation of data is similar to the data collection and management concepts that were held to be patent ineligible in previous cases. *See Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1345, 1347 (Fed. Cir. 2014); *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 610, 613 (Fed. Cir. 2016); *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1351–54 (Fed. Cir. 2016).

Regarding Patent Owner's contention that Petitioner's analysis is deficient because it "do[es] not attempt to apply the rubric outlined in the USPTO's § 101 guidance" (PO. Resp. 74–75), we disagree. The USPTO makes clear that any guidance issued "do[es] not constitute substantive rulemaking and hence do[es] not have the force and effect of law." MPEP § 2107. Here, Petitioner applies the Supreme Court's two-step framework, described in *Mayo* and *Alice*, and considers the subject matter eligibility requirements of 35 U.S.C. 101 in view of several Federal Circuit Court of Appeals decisions. *See* Pet. 112–119.

Accordingly, Petitioner sufficiently shows that claims 1 and 24 recite an abstract idea that falls within the enumerated "[c]ertain methods of

organizing human activity" grouping of abstract ideas set forth in the Revised Guidance. Revised Guidance, 84 Fed. Reg. at 52.

d. Step 2A, Prong Two

This part of the eligibility analysis evaluates whether the claim as a whole integrates the recited judicial exception into a practical application of the exception. This evaluation is performed by (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception, and (b) evaluating those additional elements individually and in combination to determine whether the claim as a whole integrates the exception into a practical application. October 2019 Update 10–12.

Petitioner argues that claim 1 "recite[s] nothing more than 'generic processes and machinery' to achieve the result of powering a blockchain mine with natural gas." Pet. 114 (citing Ex. 1003 ¶ 522). According to Petitioner, "[t]he recited generator in Claim 1 produces power using the gas without any limitation, and the [S]pecification even explains that existing onsite generators operating—conventionally—suffice." *Id.* at 114–115 (citing Ex. 1001, 10:27–29, 11:11–14, 16:44–49). Petitioner adds that "the recited blockchain mine, despite the listed limitations, only operates as any 'digital mine' normally would and consists of standard computer hardware programmed to perform digital transactions over the internet identically to how all blockchain mine operate as described in the [S]pecification." *Id.* at 115 (citing Ex. 1001, 11:55–57, 11:67–12:4, 13:5–7, 13:15–19, 13:22–27, 13:49–52, 15:22–59; Ex. 1004 ¶ 440).

Patent Owner responds that the "claims when taken as a whole are clearly integrated into a practical application." PO Resp. 76. Patent Owner asserts that

> the challenged claims expressly include practical applications because, for example, (1) the generator of the independent claims uses natural gas from a hydrocarbon production, storage, or processing facility (not from a utility sales-gas line) that produces a continuous flow to improve oil field waste gas technologies, (2) the independent claims recite the presence of blockchain mining devices that provide flexibility to modulate the load applied to the generator, and (3) the generator, mining processors, and network interface of the independent claims form an integrated system within the challenged claims.

Id. at 77 (citing Ex. 2010 ¶ 173). Patent Owner asserts further that "[i]t would be impossible to carry out Petitioner's proposed abstract idea of using natural gas to power a blockchain mine without each of these hardware components," and as such, "the challenged claims recite a practical application under Step 2A, Prong Two." *Id.*

We have reviewed Patent Owner's arguments and cited evidence and determine, on this complete record, that Petitioner provides sufficient arguments and evidence to support its assertion that there are no additional elements in claims 1 and 24 that individually or in combination integrate the judicial exception into a practical application under Step 2A, Prong Two.

We agree with Petitioner that the additional limitations in claim 1, particularly the "generator connected to the source of gas," "blockchain mining devices," and "network interface" on which Patent Owner relies, do not integrate the recited judicial exception into a practical application. These same limitations appear in claim 24. Ex. 1001, 21:55–63. It is clear from the '372 patent's Specification, including the claim language, that claims 1 and 24 are "'directed to a result or effect that itself is the abstract idea and merely invoke[s] generic processes and machinery' rather than 'a specific means or method that improves the relevant technology.'" *Yu v. Apple Inc.*, 1 F.4th 1040, 1043 (Fed. Cir. 2021) (quoting *Smart Sys.*

Innovations, LLC v. Chi. Transit Authority, 873 F.3d 1364, 1371 (Fed. Cir. 2017)); *see also Rady v. Boston Consulting Grp.*, No. 2022-2218, 2024 WL 1298742, at *3 (Fed. Cir. Mar. 27, 2024) ("The fact that Rady's patent describes the use of specialized hardware does not, standing alone, mean that his claims are not directed to an abstract idea.").

For example, the generator, recited by claims 1 and 24, is "connected to the source of combustible gas to receive a continuous flow of combustible gas to power the generator," but this would be true for all gas-powered generators while operating. The '372 patent's Specification identifies that "generator 28 may be any device that converts mechanical energy to electrical energy, such mechanical energy being converted from energy of combustion of the combustible gas." Ex. 1001, 9:66–10:3. During deposition, Mr. Barbour confirmed that the claimed generator is generic and conventional. When asked whether generators that generate electricity off of stranded gas are "specifically designed for stranded gas" or "just off-the-shelf generators you can buy" (Ex. 1033, 31:22–24), Mr. Barbour responded that "[t]here [are] some design considerations that go into any application of the generator" (*id.* at 31:25–32:1). More particularly, Mr. Barbour replied that "[y]ou can't use a diesel generator off of natural gas, so you have to have the right fuel systems.· The engine must have some tolerance to the gas quality, depending on specifics." *Id.* at 32:3–6.

Patent Owner also contends that the generator "improve[s] oil field waste gas technologies." PO Resp. 77 (citing Ex. 2010 ¶ 173). However, claim 1 does not recite such an improvement. And, to the extent Patent Owner argues that "[t]he integration of the generator of the claim that receives the continuous flow of combustible casing gas and the special-purpose mining processors within the supportive blockchain mining devices

is a significant concrete technological innovation" (PO Resp. 73), we do not view claims 1 and 24 as being limited to a "continuous flow of combustible casing gas," as Patent Owner suggests. Instead, we agree with Petitioner that claims 1 and 24"broadly cover not only systems drawing power from byproduct gas from oil wells, but also systems drawing power from primary product gas from gas wells, [and] gas from sales gas lines." Pet. Reply 26.

We credit Mr. Kasdorf's second declaration testimony on this point. *See* Ex. 1036 ¶ 70 (explaining that "claim 1 broadly covers gas produced as a primary product and even gas from sales gas lines."). During deposition, Dr. You did not dispute Mr. Kasdorf's understanding. For example, when asked whether claim 1 covers natural gas that may "be produced as the primary product, for example, from a gas well, or as a byproduct of oil production, for example, from an oil well" (Ex. 1034, 103:11–15), Dr. You responded that claim 1 "covers both, if it meets the requirement of the source of combustible gas produced from facilities selected from a group consisting of a hydrocarbon production, storage, or processing facilities" (*id.* at 103:20–24).

As for the claimed "blockchain mining devices," the '372 patent identifies that it is comprised of several components including power meter 72, step-down transformer 80, controller 86, network equipment 88, and one or more mining processors 92. Ex. 1001, 16:32–39, 17:23–29. The '372 patent's Specification identifies that "blockchain mining device 12" may include "a network interface, such as network equipment 88, and one or a plurality of mining processors 92." Ex. 1001, 15:22–25. More particularly, the '372 patent describes that:

> [e]ach mining processor 92 may have a variety of configurations, but generally may include at least a power supply, a controller

> board and mining circuitry, such as an ASIC circuit. Various mining circuitry examples include CPU (central processing unit), GPU (graphics processing unit), FPGA (Field-Programmable Gate Array), and ASIC (application specific integrated circuit).

Id. at 17:9–15. The '372 patent's Specification identifies "a network interface" as "network equipment 88," and discloses that it "may be connected to receive and transmit data through the [I]nternet . . . or to a mining pool." *Id.* at 15:22–29; *see also id.* at 15:39–40 ("The network equipment 88 may include or be connected to a modem.").

Patent Owner contends that the "blockchain mining devices" of the challenged claims "provide flexibility to modulate the load applied to the generator." PO Resp. 77 (citing Ex. 2010 ¶ 173). However, neither claim 1 nor claim 24 recites such functionality, and thus, we see nothing in claims 1 and 24 regarding an improvement to the modulation of load applied to the generator. *Id.*; *see also* Ex. 1036 ¶ 33 (stating "load control feature is found nowhere in the independent claims"). Rather, claims 1 and 24 recite that "the blockchain mining devices each have a mining processor and are connected to a network interface," which the '372 patent describes as being implemented with generic computer components. *See buySAFE, Inc. v. Google, Inc.*, 765 F.3d. 1350, 1354 (Fed. Cir. 2014) ("a claim directed to an abstract idea does not move into section 101 eligibility territory by merely requiring generic computer implementation.") (quotation marks and alterations omitted).

Considering the judicial exception as well as the additional elements in the claim in combination also fails to integrate the judicial exception into a practical application. Claims 1 and 24 do not recite any improvement in the functioning of the generator or any other computer component. Rather, as described above, claims 1 and 24 are "'directed to a result or effect that

itself is the abstract idea and merely invoke[s] generic processes and machinery' rather than 'a specific means or method that improves the relevant technology.'" *Yu*, 1 F.4th at 1043.

Accordingly, on this complete record, Petitioner sufficiently shows that claims 1 and 24 fail to integrate the recited judicial exception into a practical application of the exception.

e. Step 2B

This part of the eligibility analysis evaluates whether the claim as a whole amounts to significantly more than the recited exception, i.e., whether any additional element, or combination of additional elements, adds an inventive concept to the claim. Under Step 2B, only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim: (3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, [and] conventional" in the field; 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. 2019 Revised Guidance, 84 Fed. Reg. at 56.

The Federal Circuit in *Berkheimer* made clear that "not every § 101 determination contains genuine disputes over the underlying facts material to the § 101 inquiry." *Berkheimer v. HP, Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018). In fact, the Federal Circuit in *Berkheimer* did not require evidentiary support for independent claim 1 because "[t]he limitations [of claim 1] amount to no more than performing the abstract idea of parsing and comparing data with conventional computer components." *Id.* at 1370.

Petitioner argues that "the '372 [p]atent invokes little more than conventional equipment used in a conventional manner to perform the

abstract idea of powering digital currency mining with field gas." Pet. 116. Petitioner points out that claim 1 "does not even require the computers be located at or near such a facility," and contends, that "before the priority date, well operators had been using well gas to generate power to run mining facilities." *Id.* (citing Ex. 1005 ¶ 24; Ex. 1013, 2). According to Petitioner, the '372 patent "does not claim a new or unique method of power generation, nor does it claim a new or unique method of blockchain mining. Rather, it claims nothing more than plugging a conventional blockchain miner into a conventional generator system." *Id.* at 117.

In response, Patent Owner argues that Petitioner's analysis is deficient under Step 2B because it is based "on misreading the claims, treating each element of each claim as unconnected and orphaned, and disregarding the invention as a whole." PO Resp. 77–78. According to Patent Owner, the Petition fails to consider the elements of the claims individually and in combination, and as such, "confirms that the claims contain inventive concepts that were not well understood, conventional or routine." *Id.* at 78.

We have reviewed Patent Owner's arguments and cited evidence and determine, on this complete record, that Petitioner provides sufficient arguments and evidence to support its assertion that claims 1 and 24 fail to recite significantly more than an abstract idea.

As noted above, the additional elements of "the generator connected to the source of gas," "blockchain mining devices," and "network interface" are recited at a high level of generality. As recited in claims 1 and 24, each of these components operates in its ordinary and conventional capacity to perform the well-understood, routine, and conventional functions of generating power in order to supply power to "blockchain mining devices," that perform blockchain activity, without any technical advances or technical

details used to accomplish the functions. *See Ericsson Inc. v. TCL Commc'n Tech. Holdings Ltd.*, 955 F.3d 1317, 1330–31 (Fed. Cir. 2020) (reciting "an access controller for controlling access," "an interception module for receiving a request," and "a decision entity for determining if the request should be granted," were insufficient to turn the claim into anything more than a generic computer for performing the abstract idea of controlling access to resources which does not confer patent eligibility even if the elements lead to a more efficient way of controlling resource access); *see also Alice*, 573 U.S. at 225 (a claim that does no more than require a generic computer to perform generic computer functions lacks an inventive concept sufficient to demonstrate patent eligibility at step two).

Considered as an ordered combination, the components of claims 1 and 24 add nothing that is not already present when they are considered separately. The sequence of using a generator to supply power to "blockchain mining devices" that perform blockchain activity is equally generic and conventional or otherwise held to be abstract. *see, e.g., Alice*, 573 U.S. at 225–26; *Mayo*, 566 U.S. at 73; *see also, e.g.*, *In re TLI Commc'ns*, 823 F.3d at 615 (concluding patent claims ineligible at step two in part because "the recited physical components behave exactly as expected according to their ordinary use"); *cxLoyalty, Inc. v. Maritz Holdings Inc.*, 986 F.3d 1367, 1377 (Fed. Cir. 2021) (determining that using an account to complete purchase transactions via the Internet as a currency transaction based on points comprised steps that were well-understood, routine, and conventional, specified at a high level of generality); *Rady*, 2024 WL 1298742, at *5 (determining that the use of conventional item analysis components and existing blockchain technology to implement the abstract idea of gathering and storing information about physical objects fails to

supply the inventive concept required at *Alice* step two); *Trinity Info Media, LLC v. Covalent, Inc.*, 72 F.4th 1355, 1367 (Fed. Cir. 2023) (explaining that "no inventive concept [is found] where claims merely recited 'generic features' or 'routine functions' to implement the underlying abstract idea" (citations omitted)). Claims 1 and 24 do not invoke any of the considerations that courts have identified as providing significantly more than an exception; the combination of elements is no more than the sum of their parts.

We also are not persuaded by Patent Owner's argument that "the Petition errs in concluding that the claimed system need not be 'be located at or near'" a hydrocarbon facility. PO Resp. 79 (citing Pet. 116). Patent Owner is correct that claims 1 and 24 recite "that the 'generator [is] connected to the source of combustible gas' that is 'produced from a . . . hydrocarbon production, storage, or processing facility.'" *Id.* at 78 (citing Ex. 1001, claims 1, 24; Ex. 2010 ¶ 174). However, in light of the '372 patent's Specification, we do not read claims 1 and 24 to preclude or otherwise be at odds with Petitioner's contention that claims 1 and 24 "do[] not even require the computers be located at or near such a facility." *See* Pet. 116.

In this regard, the '372 patent simply describes that "generator 28 and blockchain mining device 12 may be positioned at a suitable location relative to the hydrocarbon well, storage site, or processing facility." Ex. 1001, 9:14–17. Although the '372 patent envisions an embodiment that would support Patent Owner's position, i.e., that the "Petition misapprehends the claims insofar as it contends that the claimed system and method need not be proximate to the hydrocarbon facility" (PO Resp. 78; *see* Ex. 1001, 9:17–19 (describing that generator 28 and blockchain mining

device 12 may be located within "one hundred meters," i.e., adjacent to remote oil well 14)), the '372 patent includes additional embodiments where generator 28 and blockchain mining device 12 may be located "one kilometer" or even "further distances away" from remote oil well 14." Ex. 1001, 9:20–22.

Equally unpersuasive are Patent Owner's arguments regarding claim 1's recitation of "continuous flow of combustible gas." PO Resp. 78–80. Claim 24 includes a substantially similar recitation. According to Patent Owner, "the Petitioner wrongfully dilutes the inventive concept of the independent claims by proposing a construction of 'continuous flow of combustible gas' that reads 'continuous' out of the claim." *Id.* at 79. However, Patent Owner's argument is an argument based on the abstract idea itself. In addition, the complete record demonstrates that the challenged claims' recitation of "a generator connected to the source of combustible gas to receive a continuous flow of combustible gas to power the generator" is performed by an off-the-shelf generator that is generic and conventional (Ex. 1033, 31:22–32:6; Ex. 1001, 9:66–10:3; *see also* Ex. 1001, 10:27–29 ("the mining device 12 may be powered by a generator 28 that is retrofitted, or already present, at a well site independent of the prime mover engine 24") 11:32–36 ("In some cases combustible gas is diverted at least partially from the atmospheric vent or combustion device to operate the blockchain mining device 12, so that relatively less gas is wasted during operation."), and, as discussed in greater detail above, we fail to discern anything sufficiently innovative about the recited generator or source of gas (*see* Ex. 1036 ¶ 70; Ex. 1034, 103:11–24). *See Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1324–25 (Fed. Cir. 2016) ("[T]he claims 'add' only generic computer components such as an 'interface,' 'network,' and

'database.' These generic computer components do not satisfy the inventive concept requirement.").

Patent Owner further contends that "[t]he Petition commits a similar error where it divorces the blockchain mining devices that each include a mining processor and network interface from the unique application to digital currency blockchain mining." PO Resp. 80. According to Patent Owner, "[t]he Petition alludes to a 'conventional blockchain miner,' but provides no evidentiary support for that proposition, despite applications of blockchain being far from conventional at the time the inventor filed the '372 patent." *Id.* (citing Ex. 2010 ¶ 176). However, these generic computer components do not satisfy the inventive concept requirement. *See Rady*, 2024 WL 1298742, at *5 (determining that the use of conventional item analysis components and existing blockchain technology to implement the abstract idea of gathering and storing information about physical objects fails to supply the inventive concept required at *Alice* step two).

Accordingly, on this complete record, Petitioner sufficiently shows that claims 1 and 24 as a whole do not amount to significantly more than the recited exception.

i. Conclusion

Based on this complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 24 are unpatentable under 35 U.S.C. § 101 as directed to ineligible subject matter.

Claim 24 is directed to a method claim that recites "producing electricity using a generator and a source of combustible gas," and also recites other limitations that are substantially identical to those in claim 1. *Compare* Ex. 1001, 21:48–22:5 *with id.* at 19:52–20:7. As discussed above,

we discern no substantive differences between the independent claims for purposes of our patent eligibility analysis. Accordingly, we determine that independent claims 24 also is patent ineligible under § 101.

ii. Analysis: Dependent Claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40[27]

Petitioner contends that claim 1 is representative of the entire '372 patent, and as such, the dependent claims are also patent ineligible. Pet. 118–119. More particularly, Petitioner asserts that claims 2–4, 7–9, 17–23, and 25–34 "add no technological improvement to any element of Claim 1 or 24," but instead "they represent various examples of different iterations of how the abstract idea can be used or token post-solution limitations and are thereby linked to the same abstract idea and substantially similar." *Id.* at 118 (citing Ex. 1003 ¶ 529). And, with respect to claims 10–12, 15, 35–37, and 40, Petitioner asserts that these claims

> are directed to the abstract idea of modulating the power load of the blockchain device. These are common-sense insignificant post-solution activities. Just as laptops throttle performance in response to a low battery, or a facility that uses a backup power generation system, these claims are directed to conventional, known, and routine industry practices. [EX1003, 530]. The claims are simply directed to the intended result of modulated power usage with assumption someone will apply it.

Id. at 118–119.

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[27] Although Petitioner refers to dependent claims 5, 6, 13, 14, 38, 39, and 41 in this section, these dependent claims are not being challenged in this proceeding. *See* Pet. 1 (identifying that Petitioner petitions for Post-Grant Review of claims 1–4, 7–12, 15–30, 34–37, and 40). We also note that Petitioner does not include dependent claim 16 in either of these groups of claims.

Patent Owner argues that the Petition fails procedurally because Petitioner does not individually analyze any of these dependent claims and "instead offers only its contention that the claims as a group 'are various examples of different iterations of how the [alleged] abstract idea can be used or token post-solution limitations.'" PO Resp. 83 (citing Pet. 118). And, with respect to dependent claims 10–12, 35–37, and 40, Patent Owner argues that Petitioner groups these claims "together, and alleges that these challenged claims are allegedly directed to a purported second 'abstract idea of modulating the power load of the blockchain device.'" *Id.* at 87 (citing Pet. 118). According to Patent Owner, "[t]he Petition provides no support whatsoever for its position that a group of claims allegedly directed to two separate, distinct abstract ideas can meet the requirements of being unpatentable as ineligible subject matter." *Id.* at 87–88. Patent Owner argues further that the Petition fails to "explain how the three separate limitations of claims 15 and 40 are described by the purported abstract idea of 'modulating the load of the blockchain device.'" *Id.* at 88.

In Sur-reply, Patent Owner argues that its Response "explains how the claims o[f] the '372 [p]atent are meaningfully different and the Petition fails to address these differences in its analysis." PO Sur-reply 25 (citing PO Resp. 83–88). Patent Owner notes that Petitioner's "Reply does not address the Petition's failure to properly analyze each challenged claim or otherwise persuasively show that any claim of the '372 Patent is representative of the others." *Id.* (citing Pet. Reply 26–27).

We determine that Petitioner fails to articulate adequately and with particularity why dependent claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40 are patent ineligible under § 101. In this regard, we agree with Patent Owner that the Petition "is plainly insufficient and fails to meet Petitioner's

burden to perform an analysis as to each claim." PO Resp. 83. Other than its conclusory analysis, Petitioner does little to support its conclusion that "[c]laim 1 of the '372 [p]atent is representative of all the patent claims." Pet. 118 (citing Ex. 1003 ¶¶ 527–530). Petitioner's citations to the declaration of Dr. Nikolaou merely repeat what Petitioner argues in the Petition. *See* Ex. 1003 ¶¶ 527–530.

Based on this complete record, we determine that Petitioner has not met its burden to demonstrate by a preponderance of the evidence that claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40 are patent ineligible under § 101.

III. CONCLUSION[28]

After considering all the evidence and arguments presently before us, we conclude Petitioner has proven, by a preponderance of the evidence, that claims 1 and 24 are unpatentable. We conclude Petitioner has *not* proven, by a preponderance of the evidence, that claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40 are unpatentable.

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[28] 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), (b)(2).

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–4, 8, 16–22, 24–30, 34	103	Dickerson, CryptoKube, Szmigielski, and Kheterpal		1–4, 8, 16–22, 24–30, 34
1–4, 8, 10–12, 15–30, 34–37, 40	103	Dickerson, CryptoKube, Belady-989, Szmigielski, and Kheterpal		1–4, 8, 10–12, 15–30, 34–37, 40
1–4, 7–12, 15–30, 34–37, 40	103	Dickerson, CryptoKube, Belady-989, Boot, Szmigielski, and Kheterpal		1–4, 7–12, 15–30, 34–37, 40
1–4, 8, 16–22, 24–30, 34	103	MAGS, Polivka, Szmigielski, and Kheterpal		1–4, 8, 16–22, 24–30, 34
1–4, 8, 10–12, 15–30, 34–37, 40	103	MAGS, Polivka, Belady-989, Szmigielski, and Kheterpal		1–4, 8, 10–12, 15–30, 34–37, 40
1–4, 7–12, 15–30, 34–37, 40	101	Eligibility	1, 24	2–4, 7–12, 15–23, 25–30, 34–37, and 40
Overall Outcome			1, 24	2–4, 7–12, 15–23, 25–30, 34–37, and 40

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has proven by a preponderance of the evidence that claims 1 and 24 of the ’372 patent are unpatentable;

FURTHER ORDERED that Petitioner has *not* proven by a preponderance of the evidence that claims 2–4, 7–12, 15–23, 25–30, 34–37, and 40 of the ’372 patent are unpatentable; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 328(b), upon expiration of the time for appeal of this decision, or the termination of any such appeal, a certificate shall issue canceling claims 1 and 24 of the ’372 patent; and

FURTHER ORDERED because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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