

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CRUSOE ENERGY SYSTEMS, LLC
Petitioner

v.

UPSTREAM DATA INC.
Patent Owner

Case PGR2023-00039
Patent No. 11,574,372

PATENT OWNER'S RESPONSE
POST GRANT REVIEW
U.S. PATENT NO. 11,574,372

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United States Patent and Trademark Office
P.O. Box 1450
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PATENT OWNER'S EXHIBIT LIST

<u>Exhibit No.</u>	<u>Description</u>
Exhibit 2010	Second Declaration of Fengqi You, Ph.D.
Exhibit 2011	Declaration of Stephen Barbour
Exhibit 2012	Second Declaration of Sylvia Hall-Ellis Ph.D.
Exhibit 2013	Stephen G. Barbour Curriculum Vitae
Exhibit 2014	Video: "Off-Grid Bitcoin Mine Walkthrough with Steve Barbour" (parts 1 and 2)
Exhibit 2015	AntMiner S9 Installation Guide, Document Version 0.1, June 2016
Exhibit 2016	CNBC, Crypto Decoded, "These 23-year-old Texans made \$4 million last year mining bitcoin off flare gas from oil drilling," Feb. 12, 2022
Exhibit 2017	Stephanie Yang "Bitcoin in the Wilderness," March 29, 2019
Exhibit 2018	CCN, "Pipe Dream: Analysts Mull Natural Gas-Powered Bitcoin Mining Operation," March 4, 2021
Exhibit 2019	Video: "Turning Fireballs into Bits and Bitcoins _ Cully Cavness" (parts 1 and 2)
Exhibit 2020	Jaran Mellerud, et al., "Bitcoin Mining using Stranded Natural gas in the Most Cost-Effective Way to Reduce Emissions," Sept. 5, 2022
Exhibit 2021	Second Declaration of Vernon Kasdorf (filed as Ex. 1024 in PGR2023-00052)
Exhibit 2022	Deposition Transcript of Vernon Kasdorf taken in PGR2023-00039, March 29, 2024
Exhibit 2023	Plaintiff Crusoe Energy Systems LLC's Complaint and Demand for Jury Trial and Injunctive Relief, Case No. 1:22-cv-2142, <i>Crusoe Energy Systems LLC v. Alkane Midstream LLC</i>

Unless indicated otherwise, all emphasis and annotations herein are added by Patent Owner.

I. INTRODUCTION

Petitioner Crusoe Energy System, Inc (“Crusoe”) asks the Board to invalidate claims of Patent Owner Upstream Data’s pioneering patent that predates Crusoe’s own products and patents directed to the same subject matter. Thus, Crusoe in its Petition dismisses as obvious the same technology that it trumpets as novel elsewhere. Unsurprisingly, the Petition’s grounds are based on impermissible hindsight and are replete with conclusory and contradictory allegations. When the evidence is fairly considered, the Board should find that secondary considerations such as commercial success and industry skepticism strongly support validity; that there is no motivation to combine; and that the proposed combinations do not teach a number of claim elements. Accordingly, the Board should find all of the challenged claims patentable over the prior art in the Petition. Finally, Crusoe’s challenge to the claims under 35 U.S.C. § 101 is facially inadequate because it depends on a misreading of the claims and does not apply the correct legal test.

II. OVERVIEW OF ’372 PATENT

The ’372 patent claims priority to provisional application 62/456,380, filed on February 8, 2017. EX1001. The patent “relates to blockchain mining at an oil or gas facility.” *Id.*, 1:6-7. The ’372 patent explains that “[i]n upstream production of oil and gas, natural gas may be produced ... as a by-product of oil production, for example from an oil well.” *Id.*, 6:51-54. This form of natural gas is referred to as

undesirable casinghead gas, casing gas or simply raw gas. *Id.*, 4:62-63, 8:66-9:3.

The prior art knew some ways to utilize casinghead gas. For example, it was known to consume it as “on-site fuel for equipment or for instrumentation pressure.” EX1001, 6:56-58. If there was a significant gas volume beyond what could be consumed onsite, gas could be sold to market through a connection to a pipeline network or liquified for transportation to a counterparty. *Id.*, 6:59-64. If a grid connection was available, casinghead gas could be used to generate electricity for sale to the power grid. *Id.*, 6:63-67.

However, gas “may be located at a remote oil and gas site” that lacks “accessible infrastructure such as an external pipeline network (sales line) or external power grid to sell into” and may be “hundreds of kilometers outside of the nearest town.” *Id.*, 7:46-49, 8:20-23. In such cases “it may not be economically feasible” to take the gas or electricity to market, “for example due to significant capital expense required or when the volume of gas is insufficient to pay out the investment.” *Id.*, 7:49-54, 8:11-23. As is known in the art, the gas is “stranded.” *Id.*, 7:54-56; EX2010, ¶32.

In such cases, a common solution is to vent or flare (burn) the stranded gas. EX1001, 1:11-13, 7:61-8:10. However, this solution creates greenhouse gas emissions, wastes the potential energy of the gas, requires capital expenditure, and may pose health risks. *Id.*

The novel solution taught by the '372 patent avoided the flaring of stranded gas at a hydrocarbon facility by providing the continuous flow of stranded gas to a generator used to power a portable blockchain mining device. *Id.*, 2:18-24.

“A blockchain is a form of database, which may be saved as a distributed ledger in a network of nodes that maintains a continuously-growing list of records called blocks.” *Id.*, 11:45-47.

Blockchain mining (also referred to as crypto mining) differs from many other types of computing as it is “intentionally designed to be resource-intensive and difficult so that the number of blocks found each day by miners remains steady.” *Id.*, 13:29-33, 13:44-48. This intentionally energy-intensive problem comprises “a cryptographic hashing algorithm.” *Id.*, 13:49-52. Since the energy cost of crypto mining is the primary operating cost, the prior art mines were located primarily in places with low-cost hydroelectric power such as China or the Pacific Northwest in the United States. *Id.*, 14:4-20; EX1009, 105; EX2010, ¶¶36-37.

Decentralizing crypto mining away from hydroelectric power to make use of stranded gas at remote hydrocarbon production facilities required innovative solutions disclosed in the '372 patent. For example, unlike existing crypto mines which could depend on reliable power sources (e.g., a hydroelectric power plant), the '372 patent's bitcoin mine in some cases had to solve the problem of variable,

albeit continuous, casehead gas production. EX2010, ¶38. The '372 patent discloses solving this problem by, for example, the mining controller modulating the mining power load (also referred to as the hashrate) in real time to respond “to variations in a supply or production rate of natural gas.” EX1001, 17:61-18:15. In addition, crypto mining power levels may be adjusted to a daily minimum or maximum gas production rate as different strategies to mitigate the variable production. EX1001, 18:34-19:13; EX2010, ¶38.

III. CLAIM CONSTRUCTION

A. Petitioner's Construction Of “Blockchain Mining Devices” And “Mining Processor” Is Not Supported By The Intrinsic Record

The intrinsic evidence of the '372 patent does not support Petitioner's constructions. First, Petitioner nearly equates the meaning of a “blockchain mining devices” with a “mining processor.” Petition, 4-6. But, the specification makes clear (including with reference to Figure 4) that the “mining device 12” is made of up of many 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.*” EX1001, 16:32-39 (emphasis added); *see also* 15:21-25; 17:23-29; 19:59-62; EX2010, ¶40. The specification tracks the plain language of the claims that confirm that the term “blockchain mining devices” refers to, for example, one or more mining processors and a specialized network interface that communicates with a blockchain database. EX1001, 15:21-25;

17:23-29; 19:59-62; EX2010, ¶40. Thus, no construction of the term “blockchain mining devices” is necessary.

With respect to the mining processors 92, the '372 patent details 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 an ASIC circuit. EX1001, 17:9-12. The specification again tracks the plain language of the independent claims that recite 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.” EX1001, 19:66-20:2. A POSITA, therefore, would understand that at a minimum, a mining processor is “a processor with blockchain mining circuitry.” EX2010, ¶41.

Petitioner's faulty constructions derive in part from Petitioner's reliance on disclosure pertaining to a “network of nodes” to reach its conclusion regarding the terms “blockchain mining devices” and “mining processor.” But, the specification teaches that nodes simply “maintain ... records” (EX1001, 14:22-43) versus mining processors that “perform data mining operations, for example verifying cryptocurrency transactions.” EX1001, 14:62-63. As the specification makes plain, a simple node may be “desktop computers, laptop computers, tablet computers, cellular telephones, servers, or other suitable devices” used for storing already computed blocks within a blockchain. EX1001, 14:30-33. But, the mining

processor provides the “require[d] computational effort” measured by the “hashrate.” EX1001,13:49-58; EX2010, ¶42.

Finally, Petitioner offers no support whatsoever for its proposal to attach the negative limitation “without regard to processor speed or power” to either identified claim term. There is simply no claim language in the '372 patent, no specification support within the '372 patent, and no reason to be gleaned from the prosecution history to graft the notion of “any processor ... without regard to processor speed or power” into the claims. *Id.*, ¶42. To the contrary, the specification repeatedly teaches that the “computation effort” is important, so much so that the '372 patent teaches optimizing the hashrate by, for example, “changing ... the clock rate of the processor.” EX1001, 13:49-54; EX2010, ¶43. A POSITA would find no support for a requirement that the “blockchain mining devices” or “mining processors” exist “without regard to processor speed or power.” *Id.*

B. Petitioner's Construction Of A “A Continuous Flow Of Combustible Gas” Is Inconsistent With The Intrinsic Record

Petitioner's construction of “continuous flow of combustible gas” similarly divorces the claim term from the surrounding claim language, the specification's description of the source of combustible gas, and ignores the prosecution history. Petition, 6. Petitioner's proposal renders superfluous the word “continuous” in the claim because it suggests that any “time period” where “a flow” is momentarily

present, no matter how small the time period may be, is “continuous.” EX2010,

¶44. Under a literal reading of Petitioner's proposal, a flow of combustible gas that occurred for a few minutes and then disappeared would meet the limits of “a flow of combustible gas that is continuous for at least a time period.” *Id.* Thus, Petitioner's proposal is inconsistent with the plain meaning of the claim language requiring a *continuous* flow. *Id.*

The '372 patent specification confirms that the “continuous” character of the flare gas in the '372 patent derives from the fact it is a by-product of hydrocarbon (oil) production, storage, or processing, and cannot be avoided during production. EX1001, 6:35-39 (“Natural gas may naturally separate from the oil stream as it is produced up the well ...”); *id.*, 6:48-51 (“Natural gas may also be liberated out of solution from the oil as it is treated ...”); EX2010, ¶45. In remote areas, where an oil field operator is confronted with this continuous source of natural gas, “the operator is forced to do something with the excess or stranded gas and is left with few options” such as “venting ... flar[ing], ... or ceasing production....” EX1001, 7:54-60. The recitation of a “continuous flow of combustible gas” reflects that the combustible gas is continuous (albeit at varying production rates) as a byproduct of “hydrocarbon production, storage, or processing.” *Id.*

Petitioner identifies a portion of the '372 patent specification describing an embodiment of the invention that uses a controller to modulate the blockchain

mine load in relationship to a varying gas supply. EX1001, 17:47-60. The portion of the specification identified by Petitioner teaches the advantageous use of controller settings to deliver a stable and consistent load from the mining processors throughout the day, even during periods of time where the production rate of combustible gas exceeds the minimum production rate. EX1001, 18:16-27; EX2010, ¶46. Contrary to Petitioner's proposed construction, the implementation of these controller settings does not disclose a supply of combustible gas present for merely "a time period," but instead describes a varying production rate between a minimum and maximum production rate. EX2010, ¶46.

Finally, Petitioner and its expert opine that "the gas supply from any given oil field is limited and will eventually dry up" to support the proposal that requires a supply of combustible gas during "any time period." Petition, 6. Petitioner's expert's opinion is not only disputable, it does not find support in the specification and is not pertinent to the problem of flare gas that is a byproduct of hydrocarbon production described in the '372 patent. EX2010, ¶47. That a well may at some point stop producing hydrocarbons does not justify the "any time period" language because the '372 patent is directed to a problem that exists while flare gas is produced. *Id.* Thus, a POSITA would not accept Petitioner's proposed construction for the "continuous flow of combustible gas." *Id.*

C. Level of Ordinary Skill in the Art

The Petition and related declarations propose two alternative levels of ordinary skill in the art, where the second alternative does not require any formal education or any experience in the field of oil or gas production. The Patent Owner and Dr. You applied Petitioner's articulation and confirmed the prior art analysis detailed below would not change based on disagreements over the level of ordinary skill in the art. EX2010, ¶17. Similarly, Patent Owner 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.

IV. NON-OBVIOUSNESS

A. Ground 1.

1. Petition Based on Impermissible Hindsight

Petitioner asserts that the claimed invention had "been done before," (Petition, 1), but Ground 1 relies on *four* references even for the independent claims. Petitioner ignores the pioneering nature of the '372 invention which materially advanced the knowledge in the art and engages in hindsight reconstruction of the claims using references that a POSITA would not have combined.

The CryptoKube system purportedly discloses "a commercialized industrial Bitcoin mining system." EX1004, ¶63. The CryptoKube Brochure discloses that "CryptoKube can run inside a large warehouse, outside in a parking lot or in a

server pod farm where the power is cheapest.” EX1006, 4. Yet there is no indication in the CryptoKube references of *any* actual or even hypothetical use of CryptoKube with a generator at an oil or gas production facility which “are typically located in remote areas where no utility power is available” as explained by Dickerson. EX1005, ¶24. Nor does Petitioner’s declarant Mr. Kasdorf – identified as “the owner and partner in KubeData Systems Inc.” – provide even a single instance of CryptoKube powered by flare gas at a remote oil or gas production facility.

At his recent deposition Mr. Kasdorf confirmed that he is not aware of any CryptoKube systems *ever* being used with a flare gas powered generator. EX2022, 20:14-20. Nor is Petitioner’s expert aware of *any* examples of a cryptocurrency miner powered with a flare gas generator before the ’372 patent’s priority date. EX2022, 20:23-21:7.

As discussed in more detail below, before the pioneering invention of the ’372 patent, persons of ordinary skill in the blockchain or cryptocurrency mining field had limited awareness of oil and gas industry generally and certainly did not consider flare gas as a suitable energy source for mining. EX2010, ¶52. Thus, Mr. Kasdorf admitted that “I don’t consider myself a POSITA in the gas and oil industry,” nor was he aware of any persons of ordinary skill in the Bitcoin mining industry who were also a POSITA in the oil and gas industry. EX2022, 16:17-17:3.

Likewise, those in the oil and gas industry did not consider bitcoin mining as a suitable way to manage stranded gas. For example, a CNBC article (EX2016, further discussed below in connection with secondary considerations of validity) quotes Adam Ortolf, Patent Owner's current sales manager: "In 2018, I got laughed out of the room when I talked about mining bitcoin on flared gas." EX2016, 7; EX2010, ¶53.

Thus, objective evidence shows that as of the February 8, 2017 filing date of the '372 patent's provisional application those of ordinary skill did not consider obvious a combination of flare gas powered generator and a bitcoin miner. EX2010, ¶54.

2. Secondary Considerations of Non-Obviousness

Before making an obviousness determination, the Board must consider the evidence of obviousness in light of any evidence of secondary considerations of nonobviousness presented by Patent Owner. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966) ("Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.") Thus, notwithstanding what the teachings of the prior art would have suggested to one skilled in the art, secondary considerations (objective evidence of

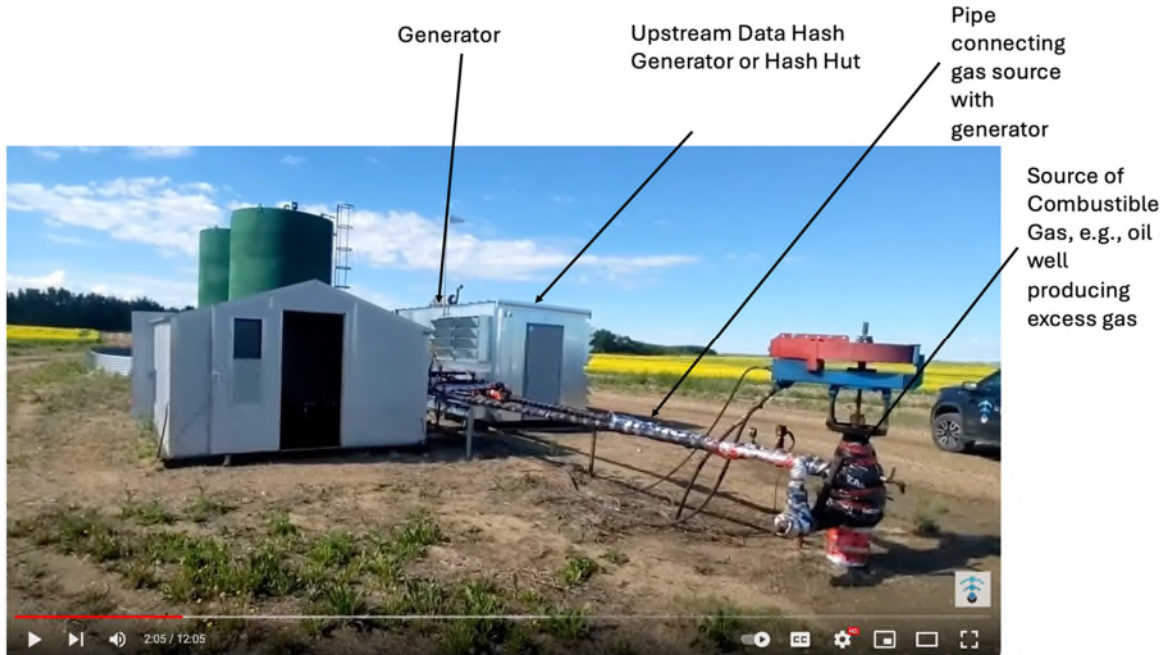
nonobviousness) may lead to a conclusion that the challenged claims would not have been obvious. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984).

In order to accord substantial weight to secondary considerations in an obviousness analysis, “the evidence of secondary considerations must have a ‘nexus’ to the claims, i.e., there must be ‘a legally and factually sufficient connection’ between the evidence and the patented invention.” *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019). Although the patent owner bears the initial burden of proving a nexus (*WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999)), a presumption of nexus may be appropriate if the patent owner shows “the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with them.’” *Polaris Indus, Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018). A prima facie nexus is established when the patent owner shows significant sales in a relevant market and that the product sold is the invention claimed in the patent. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). As shown below, Patent Owner's systems are the invention disclosed and claimed in the '372 Patent, and have achieved commercial success and praise in the industry.

a. Patent Owner's systems embody the claimed invention

Patent Owner's systems, such as Upstream Data Hash Hut, Hash Generator and similar products embody claims 1 and 24 of the '372 patent. EX2010, ¶¶74-76. For example, as illustrated in the following annotated diagram using a screenshot from an Upstream Data promotional video available on YouTube,¹ Hash Hut and Hash Generator systems are installed with a source of combustible gas such as gas produced at an oil wellhead (limitations [1 *pre*], [1*a*]). EX2011 (Barbour Declaration), ¶¶7, 9-10; EX2010, ¶76. A continuous flow of this gas is supplied to a generator through a pipe where the generator may be co-housed with blockchain mining equipment as illustrated in the screenshot (Hash Generator model), or located in a separate adjacent enclosure (Hash Hut model) (limitations [1*b*], 1*c*):

¹ EX2014.



EX2011, ¶10; EX2010, ¶76.

Petitioner has identified a single CryptoKube or Polivka system with multiple ASIC mining servers as satisfying the “blockchain mining devices each having a mining processor” limitations. Under this view an installation with a single Upstream Data system with plural mining servers likewise meets the limitation. EX2010, ¶77.

While the above example shows an installation with a single Upstream Data system, many such installations comprise multiple systems. The following photograph shows an installation with multiple Hash Generator systems running on stranded gas at an oil production facility ([1b], [1c]):



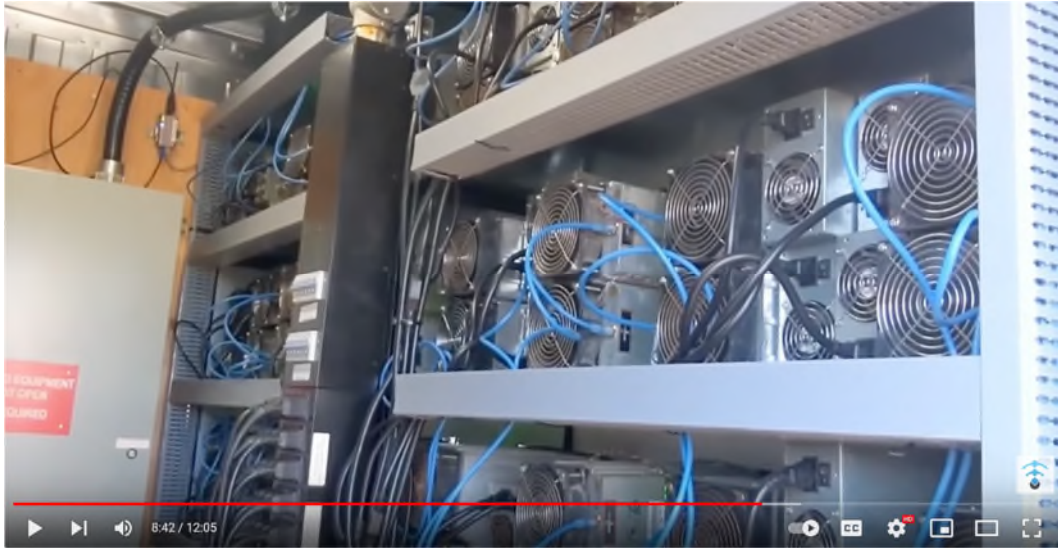
EX2011, ¶11; EX2010, ¶78.

The next screenshot shows the generator in its section of the enclosure
(limitation [1b]):



EX2011, ¶12.

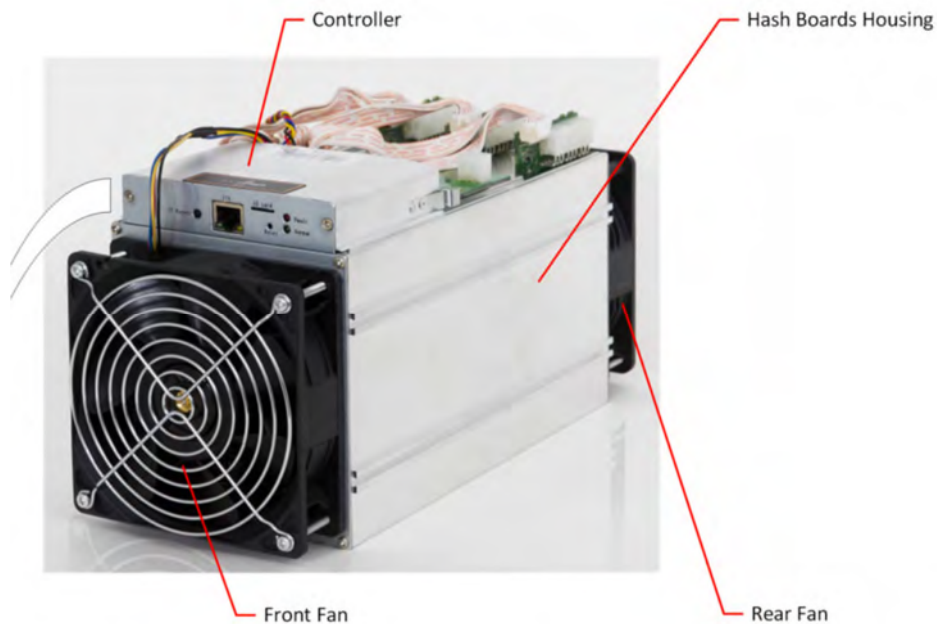
Each Upstream Data blockchain mining device such as a Hash Generator or a Hash Hut houses a number of mining processors - shown in the next screenshot are racks of blockchain miners inside the enclosure, in this case Bitmain Antminer S9 ASIC miners (limitation [1c_i]):



EX2011, ¶13; EX2010, ¶80.

Each miner is connected to the Hash Generator's or Hash Hut's network interface as illustrated by the blue Ethernet cables in the screenshot above. The network interface typically comprises a cellular or satellite modem, including the corresponding antennas visible in the image of a multiple Hash Generator installation above. (limitation [1c_ii]). EX2011, ¶14; EX2010, ¶81. The modem comprises an internet connection with access to nodes comprising a blockchain database. *Id.*

A miner such as the S9 (a mining processor) comprises hash boards with dedicated blockchain mining ASICs and a controller performing a number of functions, including network communication with blockchain database nodes as illustrated in the following diagram from an S9 installation guide (limitation [1c_iii]):



EX2015, 5; EX2011, ¶15; EX2010, ¶82.

In addition, Petitioner contends that ASIC chips disclose element [1c_iii]. If this is accepted, ASIC chips in an S9 or similar miner likewise meet this limitation for this additional reason. EX2010, ¶83.

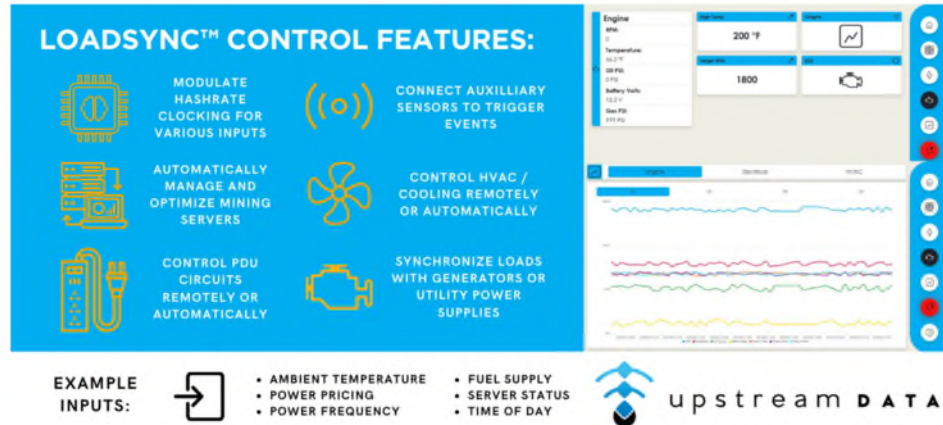
Bitcoin protocol defines a peer-to-peer network for accessing nodes of a distributed blockchain database storing Bitcoin transactional information (limitations [1c_iv], [1c_v], [1c_vi]). EX2010, ¶84.

Claim 24 is substantially similar to claim 1 and is embodied in Upstream Data's products for the same reasons. EX2010, ¶85.

Patent Owner's systems such as the Upstream Data Hash Hut and Hash Generator embody claims 10-12 and 29, 34-37 of the '372 patent. EX2010, ¶86. These systems are available with an optional controller to perform load balancing by increasing or decreasing mining activity (claims 10 and 35). EX2011, ¶18. This was done by controlling circuits to increase or decrease number of active servers (claims 11 and 36), including in response to variable gas production rate (claims 12 and 37). EX2011, ¶18; EX2010, ¶86. The current generation controller (LoadSync, illustrated in a capture from Upstream Data's website and reproduced below) continues to offer these functionalities, e.g., "automatic load balancing... to align variable natural gas fuel supply with generator loading:"

"Our patented LoadSync™ controller can be seamlessly integrated into any Hash Hut™ or Hash Generator™ loadcenter. This controller adjusts the hashrate (loading) on the energy system to maintain a perfect balance with energy supply and demand based on user requirements. LoadSync™ offers full remote management of the loadcenter while also automating loading to balance the power system. For example, it can be used to align variable natural gas fuel supply with generator loading in order to conserve vented or flared gas, or it can be employed to regulate energy consumption in accordance with fluctuating power prices from utility providers. The LoadSync™ controller is adaptable to all scenarios requiring load matching to variable energy supply! Additionally it functions as a mining server management tool, facilitating user set up, monitoring and optimization of their mining farm from anywhere in the world."

- Steve Barbour, President



EX2011, ¶18.

As seen in the images above, Upstream Data systems are connected to gas sources comprising remote oil and gas wells (claim 29). Hash Generator and Hash Hut systems mine Bitcoin transactions with their ASIC mining servers such as Antminer S9 and communicate wirelessly through cellular or satellite modems (claim 34). EX2010, ¶87.

b. Commercial success

Upstream Data's pioneering and industry-defining products embodying the '372 patent have achieved substantial commercial success.

On January 1, 2017 Mr. Barbour, the '372 named inventor, founded and

incorporated Upstream Data Inc. in Canada. Upstream Data (Patent Owner) is an energy services business with a focus on optimizing the production and generation of energy by incorporating bitcoin mining loads directly at the source of energy, such as oil and gas wells. Mr. Barbour and Upstream Data have developed numerous prototypes, commercial products and control systems to perfect the technology. The first prototype embodying the technology of the '372 patent was deployed in October 2017 and called a "Hash Generator," or "Hashgen." It incorporated a natural gas-powered generator, a bitcoin mining system and associated control system, all housed within a portable shipping container. The purpose of this product was to be placed on oil wells with stranded associated gas, the gas would be used to fuel the generator and power the blockchain mine and the control system would regulate the blockchain mining load on the generator to keep it within operating spec. Today, the newer commercial iterations of this Hash Generator continue to be Patent Owner's bestselling product. EX2011, ¶¶20-21.

Mr. Barbour achieved the first commercial sale on December 31, 2017 when the prototype Hash Generator was sold to a software engineer in the bitcoin mining industry who was interested in this novel application of bitcoin mining. An image of this first system deployed in an oil field is below:



EX2011, ¶22.

Two more sales followed in 2018. Ten units were sold in 2019, including a first U.S. sale. During this time Patent Owner continued to improve its systems, including developing the Hash Hut system for use with existing generators. As the market realized the advantages of Patent Owner's technology, thirty two sales followed in 2020, even as competitors entered the field. Thus, the sales of Hash Generator and Hash Hut systems embodying the technology of the '372 patent grew sixteen-fold from 2018 through 2020. Notably, during this time Bitcoin prices fluctuated and trended downward from \$20,000 to \$8,000 range by end of 2019. Accordingly, the increased sales were due to the superiority of Patent Owner's systems and a developing acceptance of the paradigm-changing approach to gas venting and flare reduction offered by Upstream Data, rather than a

substantial rise in Bitcoin value. EX2011, ¶23.

Since 2021 and through today Patent Owner has delivered at least an additional 284 systems embodying the '372 patent. Of the delivered systems, approximately 219 (~66%) were deployed in multi-system configurations. Approximately 101 systems (~30%) were deployed with an optional controller. EX2011, ¶24.

As discussed with regard to industry praise below, Patent Owner has been recognized as a leading company and a pioneer in the industry, underscoring the commercial success of its systems. EX2011, ¶25. For example, a 2022 CNBC article regarding crypto-mining with flare gas described Upstream Data's commercial success due to the industry's embrace of Patent Owner's technology: "Fast forward four years, and business at Upstream is booming. It now works with 140 bitcoin mines across North America." EX2016, 7.

c. Long-felt unmet need

Evidence that an invention satisfied a long-felt and unmet need that existed on the patent's filing date is a secondary consideration of nonobviousness. *Procter & Gamble Co. v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 998 (Fed.Cir.2009). Patent Owner's pioneering products solved a widely recognized and long-standing problem of stranded gas that was either released or flared at oil and gas production facilities. The problem was well-described in a 2022 CNBC article regarding

Bitcoin mining powered by stranded gas: “For years, oil and gas companies have struggled with the problem of what to do when they accidentally hit a natural gas formation while drilling for oil. Whereas oil can easily be trucked out to a remote destination, gas delivery requires a pipeline. If a drilling site is right next door to a pipeline, they chuck the gas in and take whatever cash the buyer on the other end is willing to pay that day. But if it’s 20 miles from a pipeline, drillers often burn it off, or flare it. That is why you will typically see flames rising from oil fields.”

EX2016, 2; EX2010, ¶89.

As further noted in the ’372 patent, “[v]enting gas to atmosphere is the most cost effective option for the operator but may have the most negative impact on the environment.” EX1001, 7:61-64. Flaring gas is likewise problematic because it is expensive and wasteful. EX1001, 8:1-10. Yet, in the absence of a counterparty (*e.g.*, a pipeline or electric grid), venting or flaring were the only stranded gas disposal methods recognized in the art. EX2010, ¶90.

Petitioner recognized the same long-felt unmet need in its own patents. In August, 2018, approximately a year and a half after the priority date of the ’372 patent, Petitioner filed provisional U.S. patent application No. 62/713,368 which is related to U.S. Pat. No. 10,862,307, assigned to Petitioner. EX2002. Like the challenged ’372 patent, Petitioner’s ’307 patent was directed to a “natural gas processing system [which] may process raw natural gas into a fuel gas stream that

may be used to power any number of on-site power generation modules” including “mobile data centers... adapted to mine cryptocurrency.” EX2002, Abstract.

During prosecution Petitioner's patent claims were rejected over U.S. Pat. Pub. 2020/0051184 to Barbour which corresponds to the '372 patent. EX2003, 05-07-2020 Office Action.

In the '307 specification's Background section Petitioner noted that “large-scale flaring of natural gas has raised serious environmental and health concerns” and asserted that “there remains a need for systems and methods for generating electricity from natural gas produced from oil wells,” and that “[i]t would be beneficial if such electricity could be produced and consumed on-site, for example by using it to operate power-intensive, modular processing units... employed to mine cryptocurrency.” EX2002, 1:55-57, 2:35-42. The '307 summary section described “convert[ing] raw natural gas into a fuel gas stream to power any number of on-site power generation modules” which in turn power “distributed computing units” that “may be adapted to mine cryptocurrency.” *Id.*, 2:45-55. Thus, as acknowledged by Petitioner's expert, its '307 patent in 2018 proposed to combine power generated from flare gas with computing units adapted to mine cryptocurrency as a solution to an existing problem. EX2022, 44:5-14.

When asserting its '307 patent in litigation, Petitioner likewise recognized gas flaring and the energy-intensive nature of cryptocurrency mining as problems

in the industry. EX2023, ¶¶22-26. Petitioner's complaint characterized its 2018 solution – “harvesting stranded natural gas to offset the energy consumed during cryptocurrency mining” – as a “**lightbulb moment.**” EX2023, ¶27 (emphasis added). Yet, Petitioner now characterizes combining stranded natural gas-powered generators with cryptocurrency mining as merely obvious, demonstrating the impermissible hindsight of its obviousness theories.

d. Industry skepticism

“Evidence of industry skepticism weighs in favor of non-obviousness.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1335 (Fed. Cir. 2016). Here, as further discussed below, the oil and gas industry did not know about crypto mining and rejected it as a way to reduce the stranded gas problem. EX2010, ¶93; EX2011, ¶30. Instead, the industry believed that a counterparty such as a grid or pipeline was necessary if flaring was to be avoided. *Id.* The crypto-mining industry was not knowledgeable about the oil and gas business, was unaware of the stranded gas issue and did not understand that flare gas could profitably and reliably power a cryptocurrency miner. *Id.* Below are some examples of this universal skepticism:

- “**Laughed out of the room:**” a 2022 CNBC article described how in 2018 Adam Ortolf, Patent Owner's current sales manager, “got laughed out of the room when I talked about mining bitcoin on flared

gas:' 'The concept of bringing hydrocarbons to market without a counterparty was laughable.'" EX2016, 6; EX2012, ¶¶17-20.

- ***"Stupidest thing I've ever heard:"*** in the 2022 CNBC article the founders of Giga, one of Patent Owner's early customers and current competitors, described their interactions at a 2020 industry conference when they handed out materials describing powering Bitcoin miners with stranded gas: "A lot of people didn't know about it. Most people laughed at us. Most people said, 'It's the stupidest thing I've ever heard.'" EX2016, 8-9; EX2011, ¶32. Notably, Giga's founders also described the idea of crypto-mining with stranded gas as an "obvious solution" to them in 2019 after they purchased Patent Owner's system, three years after the '372 priority date. EX2016, 2-3.
- ***"Bewildered Crowd:"*** '372 inventor Mr. Barbour, in an interview with the Wall Street Journal in March, 2019, noted continuing industry skepticism: "But he has struggled to get oil-industry veterans interested in mining cryptocurrencies. In September, he showcased a rough version of his mining container at an oil show in Lloydminster, a city on the Alberta and Saskatchewan border, to a bewildered crowd. 'Locally, pretty much nobody knows what bitcoin is,' he said." EX2017, 6; EX2011, ¶33; EX2012, ¶¶21-24.

- ***“Pipe Dream.”*** a 2018 article with that title describes Wall Street analysts with a “unique idea” to mine Bitcoin with stranded gas in the Permian basin: “shale producers would capture the excess natural gas and use it to produce electricity, which would then be used to power an on-site Bitcoin mining operation.” EX2018, 4-5; EX2012, ¶¶25-28. However, bowing to ingrained conventional wisdom in the industry the analysts concluded that such a project “will remain, for now, a dream.” *Id.*
- ***“No version of this will ever work.”*** Petitioner’s co-founder and named inventor on ’307 patent, Cully Cavness, gave a presentation at a TEDx event, a video of which is available on YouTube at <https://www.youtube.com/watch?v=0CerPYbKx78>. Mr. Cavness discussed Petitioner’s technology which, like the earlier invention of the ’372 patent, comprised powering Bitcoin miners with energy generated from stranded gas; at approximately the 15:36 mark Mr. Cavness described pitching this concept to a potential partner whose reaction was “No version of this will ever work:”



EX2019, 15:36; EX2011, ¶35; EX2012, ¶¶29-30.

At his deposition Petitioner's expert recalled telephone discussions with potential customers in the 2014-16 timeframe regarding connecting a CryptoKube to a flare gas-powered generator but testified that none resulted in a sale and that "[t]hey did not connect a Crypto Kube to their flare gas powered generator."

EX2022, 19:3-20:10. This is unsurprising in view of the skepticism in the industry about the technological and financial feasibility of this combination before the invention of the '372 patent. EX2010, ¶99.

e. Industry praise

"Evidence that the industry praised a claimed invention or a product which embodies the patent claims weighs against an assertion that the same claim would have been obvious." *WBIP*, 829 F.3d at 1335. Patent Owner and its technology

embodying the '372 patent invention have been recognized as industry pioneers.

For example, a September 5, 2022 report by K33 Research, an industry publication, asserted in its title that “Bitcoin mining using stranded natural gas is the most cost-effective way to reduce emissions.” EX2020, 1; EX2012, ¶¶31-34.

The report acknowledges Upstream Data as a “leading company” and credits Patent Owner with having “pioneered the concept in 2017.” EX2020, 7. (emphasis added); EX2011, ¶36.

Writing five years after the '372 patent priority date, K33 Research noted the advantages of Bitcoin mining as a way to soak up stranded gas: “Because bitcoin mining is an unconstrained location-agnostic process, bitcoin miners can come directly to oil wells to eat up the excess natural gas. In addition, since oil sites typically produce declining amounts of excess natural gas as they mature, an offtaker must be able to scale down its operation modularly. Bitcoin mining is a modular process since you can combine different numbers of machines into varying energy usage levels.” *Id.*

Patent Owner's pioneering technology is what allowed the industry to recognize these advantages in the face of pervasive industry skepticism. As discussed above, the oil and gas industry believed that only a traditional counterparty such as an electric grid or gas pipeline made it worthwhile to invest in equipment to offload stranded gas. EX2010, ¶102. The cryptocurrency mining

industry believed that industrial miners such as CryptoKube or Polivka needed to run at maximum hashrate and little downtime to make a profit, therefore fixating on hydroelectric power as the low-cost and reliable solution. EX2010, ¶102. Patent Owner's Hash Hut and Hash Generator technology embodying '372 patent claims changed the paradigm of both industries, thereby giving rise to what the K33 Research report characterized as "massive oil field bitcoin mining growth over the past few years" and creating a "valuable tool in our toolbox for mitigating gas flaring." EX2020, 6, 8.

3. Szhmigielski Cannot Supply Missing Motivation to Combine

Petitioner relies on Szmigielski's statement that "[o]ne of the biggest costs for Bitcoin miners is the cost of electricity" as the motivation to combine Dickerson and CryptoKube. Petition, 20; EX1009, 105.² The Institution Decision likewise credits this statement as supplying the motivation to combine. PGR2023-00039 Paper 14 (Institution Decision) at 34.

Szhmigielski wasn't saying anything new as the cost of electricity was one known driver of cryptocurrency mining profitability. However, neither the

² The Petition appears to cite EX1009 using original pagination rather than exhibit page numbers. For consistency with other exhibits, this POR cites to EX1009 exhibit page numbers.

statements in Szhmigielski nor the generally known desirability of cheap power ever *actually* motivated a combination of a cryptocurrency miner with flare gas power generation before the invention of the '372 patent, demonstrating the hindsight bias of this alleged motivation. EX2010, ¶56.

Put another way, if the combination was so “easy” as alleged by Petitioner, why was it never attempted? The answer is that, for a number of reasons, there was no motivation to combine a cryptocurrency miner with flare gas power generation and no reasonable expectation of success.

As an initial matter, the idea that Dickerson supplies “free excess electricity” is misplaced because it ignores the significant cost of Dickerson’s complex system. EX2010, ¶58. Petitioner does not specify whether the proposed combination involves a POSITA financing both a Dickerson system and a CryptoKube. Petitioner’s expert testified that a CryptoKube system sold for approximately \$60,000.00. EX2022, 28:24-29:17. A POSITA would understand that Dickerson’s system would cost at least hundreds of thousands of dollars due to its complexity, several multiples of the cost of a CryptoKube. EX2010, ¶58. This capital expense, further including ongoing expenditure to maintain Dickerson’s membranes and gensets, would more than offset any operational cost savings on power relative to established lower-cost power sources such as hydro. *Id.* Therefore, a POSITA would connect a CryptoKube to a known source of cheap and reliable electricity

like hydroelectric power (EX1009, 105) that does not require any appreciable capital investment. EX2010, ¶58. Accordingly, a POSITA would not be motivated to combine a new Dickerson system and a CryptoKube. *Id.*

A combination comprising an existing Dickerson installation and a CryptoKube would also make no sense to a POSITA. EX2010, ¶59. First, considering the perspective of the oil and gas industry, Dickerson's purpose was to power oil and gas production: "The invention includes a mobile apparatus equipped to convert raw natural gas into a suitable fuel and to use the fuel to provide electricity to an oil or gas production facility that generated the raw natural gas." EX1005, ¶11. It was well known that components such as those illustrated in Dickerson Fig. 1, including gas engine 110, generator 112 and gas conditioning system 100 (EX1005, ¶26), should be sized for the expected primary power load to eliminate the expense of buying unneeded power capacity. EX2010, ¶59. Therefore, an existing Dickerson system would be sized to generate power sufficient to run the oil and gas operation. *Id.* A CryptoKube Launch 200 required a 200A service and up to 72kW of power. EX1006, 1. A POSITA would not expect an existing Dickerson installation sized for its primary load to consistently supply that much excess power (especially given the known variability of the continuous flow of flare gas) and therefore would not be motivated to make the proposed combination. EX2010, ¶59.

Dickerson does state that “[i]n some cases the amount of electrical power required on an oil field pumping site may be small compared to the amount of power that can be produced with the gas available.” EX1005, ¶39. However, in this scenario Dickerson teaches to export excess power to the grid. *Id.* Thus, if a grid connection was available, a POSITA knew that the power generation components in Dickerson could be upsized to profitably export electricity to the grid. There is no teaching or suggestion in Dickerson or elsewhere that expensive power generation components should be upsized unless export to the grid was possible. EX2010, ¶60.

This illustrates the state of the art in the oil and gas industry before the '372 invention. Flare gas mitigation with an expensive system such as Dickerson was only considered to (1) power the oil and gas operation or (2) generate additional power if a counterparty (*i.e.*, the electric grid in Dickerson) was available. Otherwise stranded gas was simply released in the atmosphere (thereby contributing to methane pollution) or flared. EX2010, ¶61. It is for this reason that in 2018 Adam Ortolf, Patent Owner's current sales manager, “got laughed out of the room when I talked about mining bitcoin on flared gas:” “The concept of bringing hydrocarbons to market without a counterparty was laughable.” EX2016, 6; EX2010, ¶61.

The industry at that time had no knowledge of cryptocurrency mining and

did not understand whether it was technologically or commercially feasible to mitigate flare gas by generating power for a connected miner.³ EX2010, ¶62.

Therefore, there was no motivation to combine flare gas-powered generators like Dickerson or MAGS with cryptocurrency miners and no reasonable expectation of success. EX2010, ¶62.

Second, considering the perspective of the cryptocurrency mining industry also shows lack of a motivation to combine. EX2010, ¶63.

In this regard, Szmigielski teaches that, in addition to being inexpensive, electric power for crypto mining must be “*reliable*” to power “the hardware and the associated cooling systems.” EX1009, 105; EX2010, ¶64. The only example in Szmigielski that satisfies *both* requirements is hydroelectric power. EX1009, 105. The ’372 patent likewise identifies hydroelectric power as the state of the art for the industry: “Since the energy cost of running blockchain mining equipment is its primary operating cost, a trend towards mining on low-cost hydroelectric power

³ Further illustrating the disconnect between oil and gas and cryptomining, Petitioner’s expert Mr. Kasdorf at his deposition confirmed that he was unaware of anyone who was both a POSITA in the Bitcoin mining industry and a POSITA in the gas and oil industry at the time of the ’372 patent invention. EX2022, 16:23-17:3.

has become prevalent.” EX1001, 14:4-7. The industry's embrace of hydroelectric power was due not just to its low cost but also its reliability. Simply put, hydroelectric power is abundant and can power energy-hungry crypto miners at full hashrate, without interruption – that is, *reliably*. EX2010, ¶ 64.

Crypto mining operations are highly computationally and energy-intensive by design, as explained in the '372 patent and known in the art. EX1001, 13:29-36, 13:49-58. Szhmigielski likewise emphasized that “Bitcoin mining is inefficient on purpose.” EX1009, 121. This is unlike typical data center computing at the time of the invention which was commonly optimized to consume the least possible computational resources. EX2010, ¶65.

The need for *reliability* derives from the fact that cryptocurrency mining is expensive and can be profitable (which is the goal of a POSITA) only if the miner puts in enough resources to outpace others. As discussed above, even a single CryptoKube at a mere 72kW capacity was a \$60,000.00 investment. To make the investment worthwhile, it was known in the art to run the miners at full hashrate twenty four hours a day. This is demonstrated by Szhmigielski's discussion of ASIC mining profitability where the “percentage of the total network hashing power” is one of four main factors (along with electricity, ASIC and cooling costs) determining whether the miner will have success. EX1009, 88; EX2010, ¶66. This percentage is dependent on the hashrate, motivating a POSITA to run the

equipment at full power. The available reward is also dependent on equipment operating all the time, with Szhmigielski assuming a full twenty four hour cycle in the profitability calculation. EX1009, 88; EX2010, ¶66.

Thus, the conventional knowledge in the art before the invention of the '372 patent held that industrial ASIC miners like CryptoKube should operate at maximum uptime and at full hashrate. These requirements informed a POSITA as to what power sources were sufficiently *reliable* in addition to inexpensive – a POSITA chose a power source that could drive its crypto miners at (1) lowest cost (Szhmigielski's "inexpensive" requirement) while (2) sustaining full hashrate and maximum uptime (Szhmigielski's "reliable" requirement). EX2010, ¶67.

Applying this conventional understanding to Dickerson, a POSITA would not be motivated to use it as a power source for an industrial miner such as CryptoKube. EX2010, ¶68. As explained above, if the combination involved a dedicated Dickerson system, a POSITA would not consider it because the large expense of purchasing, installing and maintaining Dickerson would outweigh any reduction in power cost per kW versus a conventional low-cost source such as hydropower. If the combination involved an existing Dickerson system where some amount of excess power was available, a POSITA would not consider Dickerson *reliable* because there would be no guarantee that excess power from a system sized for its primary load of oil and gas equipment (as an existing

Dickerson system would be) could run a CryptoKube at full hashrate and maximum uptime. EX2010, ¶68.

The Institution Decision states that “Petitioner was required to show that its proposed combination would have been desirable, but not necessarily the most desirable option available” to a POSITA. PGR2023-00039, Paper 14 at 30. However, as demonstrated above and further discussed below, Dickerson’s system would be entirely *undesirable* because it was *unsuitable*. A new Dickerson installation would be expensive compared to available and accepted power sources such as hydro, and therefore undesirable. An existing Dickerson installation would be undesirable because a POSITA desired to run CryptoKube at full hashrate and minimum downtime as was the conventional knowledge in the art. A POSITA understood that any excess output of an existing Dickerson system conventionally sized for its primary load would be too *unreliable* – variable and even episodic depending on flare gas flow rates – to run CryptoKube at maximum power and minimum downtime. EX2010, ¶69.

Dickerson teaches that its electrical power is *unreliable* because the system is located “in remote areas” where “no utility power is available.” EX1005, ¶24; EX2010, ¶70. The main purpose of the Dickerson generator is “to generate electricity that is returned to the facility” rather than powering a power-hungry crypto miner. EX1005, ¶6; EX2010, ¶70. Moreover, the amount of gas available to

power Dickerson's generator varies such that only "in some cases the amount of electrical power required... may be small compared to the amount of power that can be produced with the gas available." EX1005, 39. Even in these cases, Dickerson teaches sending any excess power to the grid if it is connected. *Id.* In fact, Dickerson teaches that "raw natural gas flow will be interrupted" and "there will likely be periods when the production facility will require electricity but will be generating no or low levels of raw natural gas" to run its generator, underscoring the *unreliability* of its power to run the production facility, let alone to supply "excess power" to CryptoKube. EX1005, ¶21; EX2010, ¶70.

Dickerson further teaches using a diesel generator as a backup source to mitigate unreliability. EX1005, ¶21. However, backup power would not comprise free or cheap "excess" electric power derived from waste gas that could motivate a POSITA to combine a crypto miner with Dickerson. EX2010, ¶71. Instead, a POSITA would understand that the backup fuel would be relatively expensive and would be used to power the primary load, not to supply excess power. *Id.* Therefore, a POSITA would consider excess power to be unavailable to power CryptoKube during periods of backup diesel power use in Dickerson. *Id.* In this regard the Board's suggestion that "on the whole... Dickerson would still provide cheaper power" even with a diesel backup (PGR2023-00039, Paper 14 at 32) does not consider a POSITA's expectation that backup power was sized to power the

primary oil and gas equipment load, leading to yet more undesirable downtime during backup power periods. EX2010, ¶71.

4. No Reasonable Expectation of Success

Aside from the unsupported, conclusory allegation that it was “easy” to combine Dickerson and CryptoKube (Petition, 20), the Petition does not address the reasonable expectation of success prong of obviousness analysis for this or any other ground.

The Petition must identify “with particularity ... the evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3). The burden of proving a reasonable expectation of success is on Petitioner. *Eli Lilly & Co. v. Teva Pharms. Int’l GmbH*, 8 F.4th 1331, 1348–49 (Fed. Cir. 2021) (“[I]t was, at all times, [petitioner's] burden to show that the claims would have been obvious, including that a skilled artisan would have had a reasonable expectation of success in achieving the claimed invention.”).

The Board should not let Petitioner leap silently over the requirement that it expressly address this prong of its obviousness case. *See Juniper Networks, Inc., v. Correct Transmission, LLC*, IPR2021-000682, Paper 26 at 23 (PTAB Oct. 3, 2022). In *Juniper Networks*, like here, “Petitioner never mentioned any reasonable expectation of success in the Petition,” though the petition “allege[d] reasons or motivations to modify [a reference] or combine the teachings of [references].” *Id.*

(internal quotations omitted). The Board found the challenged claims non-obvious in view of petitioner's failure to expressly address reasonable expectation of success in the petition and criticized petitioner for "leap[ing] silently over the requirement to evidence a reasonable expectation of success." *Id.*

Patent Owner respectfully disagrees with the Board's reliance on *Elekta Ltd. v. ZAP Surgical Sys., Inc.*, 81 F.4th 1368 (Fed. Cir. 2023) to excuse Petitioner's failure to address reasonable expectation of success. PGR2023-00039, Paper 14 at 33. The Federal Circuit in *Elekta* considered an appeal from a final written decision where the Board "did not articulate any findings on reasonable expectation of success" though it did address the motivation to combine and heard evidence directed to expectation of success. 81 F.4th 1368 at 1375-77. The Federal Circuit found that under those circumstances the Board did not need to make express findings directed to expectation of success. *Id.*

Accordingly, *Elekta* addresses how the Board may write its final written decision after considering evidence. It does not abrogate Petitioner's burden to identify "with particularity ... the evidence that supports the grounds for the challenge to each claim," 35 U.S.C. § 312(a)(3), including expressly addressing the reasonable expectation of success prong of its obviousness analysis. *Juniper Networks*, IPR2021-000682, Paper 26 at 23.

As established above, before the '372 invention, a POSITA would have considered the variable and even occasional excess power generation in Dickerson to be *unreliable* and therefore unsuitable for a bitcoin miner such as CryptoKube. EX2010, ¶73. This was contrary to conventional understanding which was to run the miner at full hashrate any time the miner was operating. Therefore, contrary to Petitioner's conclusory allegations, a POSITA would not consider it "easy" to combine Dickerson and CryptoKube even assuming, *arguendo*, that a POSITA considered the combination at all. *Id.*

5. Ground 1 Does Not Disclose Challenged Claims

a. Claim 1

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

[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;

The Petition does not identify the claimed "mining processor" in the proposed combination. Petition, 23, 25. However, the Petition clearly identifies "spondooliestech SP35 servers" as the claimed "blockchain mining devices:" "CryptoKube is built inside an ISO shipping container and is filled with

spondooliestech SP35 servers, that is, blockchain mining devices, each necessarily having a mining processor.” Petition, 23 (emphasis added).

If spondooliestech SP35 servers in a CryptoKube container are the claimed “blockchain mining devices,” then some unidentified component of the spondooliestech SP35 server must be the “mining processor.” A POSITA would understand these to be two distinct claim limitations. EX2010, ¶104.

Petitioner's failure to identify a specific component that is the alleged “mining processor” is impermissible. *See Microsoft Corp. v. FG SRC, LLC*, 860 Fed. App'x 708, 713 (Fed. Cir. 2021) (“Arguments in a petition must be made with particularity, not opacity.”); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“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.”) (internal quotations omitted); 35 U.S.C. § 312(a)(3) (“[T]he petition identifies, in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.”).

Moreover, the Petition “must ... identify [] specific portions of the evidence that support the challenge.” 37 C.F.R. § 42.104(b)(5). Petitioner's conclusory statement is repeated nearly verbatim by its expert who did not offer any further

explanation in his declaration or cite 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]). EX1004, ¶¶104-105, 108-109. Such conclusory testimony is insufficient to support a finding that this ground discloses “mining processor.” *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001) (holding that conclusory statements offered by experts are not evidence); *VIZIO, Inc. v. Polaris PowerLED Technologies, LLC*, IPR2020-00043, Paper 32 at 25-26 (finding conclusory expert testimony without citations to references “not sufficiently supported.”)

At his recent deposition Petitioner's expert for the first time specified that the Petition's “necessarily” present “mining processor” (Petition, 23; EX1004, ¶104) was an ASIC chip in a spondooliestech server:

Q. You did not identify any specific processor in these servers as the alleged mining processor, correct?

A. I didn't identify specifically, no.

Q. You don't know what processor allegedly was in the Spondoolies-Tech SP31 or SP35 servers, right?

A. I did in 20 - 2015. I don't recall the actual processor now.

Q. Okay. And you didn't identify it in your declaration, correct?

A. I did not.

Q. Now, the processor that in your opinion is necessarily present in the Spondoolies-Tech SP31 or SP35 servers is an ASIC, correct?

A. That is an ASIC processor of Spondoolies, correct.

Q. Okay. And in fact, there would be some number of these ASIC processors, correct?

A. There would be multiple ASIC processors in a Spondoolies SP35.

Q. And each ASIC processor – well, let me – okay. And the ASIC processor is an integrated circuit, correct?

A. You would identify it as an integrated circuit.

Q. So in other words, it's a chip, right?

A. ASIC processor is a chip.

Q. And so the mining processor that you are saying is necessarily present is an ASIC chip, correct?

A. The mining processor in an SP35 or SP31 is an ASIC chip.

EX2022, 59:9-60:16 (emphasis added).

This explanation goes well beyond the vague allegations in the Petition.

However, to the extent the Board considers this belated allegation, 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].⁴ EX2010, ¶106.

While Petitioner has not provided *any* evidence (aside from its expert's conclusory statements) regarding ASIC chips in spondooliestech SP35 servers, the '372 patent specification illustrates a POSITA's understanding. EX2010, ¶107. The specification at col. 17:9-22 describes typical mining processors known to a POSITA at the time of the invention and explains that “[e]ach mining processor 92 may have a variety of configurations, but generally may include at least a power

⁴ For this claim element, the Petition merely states that “CryptoKube is built inside an ISO shipping container and is filled with Bitcoin miners such as spondooliestech SP35 servers” and that “[a] POSITA 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.” Petition, 25. For the reasons stated above, Petitioner has not met its burden of proving this limitation with conclusory and unsupported statements that do not identify “the mining processor” or explain why a POSITA would conclude that it (whatever it is) would meet the claim limitations.

supply, a controller board and mining circuitry, such as an ASIC circuit.” EX1001, 17:9-22; EX2010, ¶107.

The specification further describes an “ASIC mining processor” that a POSITA would recognize as exemplary of spondooliestech SP35 and similar ASIC mining servers known at the time of the invention. EX2010, ¶108; EX1001, 17:15-21; EX2022, 64:7-25. The ASIC mining processor includes hash boards, a controller, and a power supply. EX1001, 17:15-21. The hash boards comprise “numerous chips that is *[sic]* doing the hashing.” EX1001, 17:15-17. A POSITA understood that “hashing” refers to the computations required to mine blockchain transactions performed by the ASIC chips on hashboards. EX2010, ¶108; EX1001, 13:57-58.

Accordingly, 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. EX2010, ¶109; EX1001, 17:15-21; EX2022, 61:1-7. Therefore, contrary to Petitioner’s conclusory statement, such ASIC chips were not “connected to the network” or “adapted... to communicate with the blockchain database” as required by the claim language. EX2010, ¶109; EX1001, claims 1, 24.

Network connection and communication with the blockchain database was handled by other components in ASIC mining servers known at the time of the invention. EX2010, ¶110. For example, the ’372 patent specification discloses a

controller component of an ASIC mining processor “to communicate with the network.” EX1001, 17:15-19. However, a POSITA would not understand this component to be a “mining processor” and Petitioner has not identified it as such. EX2010, ¶110. Moreover, unlike the ASIC chip, the controller component does not mine transactions as required by the claim language. *Id.*

More generally, the '372 specification describes (and illustrates in Figs. 6A-6B) nodes 122 on a blockchain network with a distributed blockchain database stored on the nodes. EX1001, 14:21-25. Nodes with mining functionality comprise “[m]ining circuitry 130, for example an integrated circuit chip, may be used to perform data mining operations, for example verifying cryptocurrency transactions,” while “[n]etwork communication hardware 131 may be used to communicate with other nodes and the network in general.” EX1001, 14:61-65, Figs. 6A-6B. This is another illustration of the distinction between mining operations performed by an integrated circuit chip and communication operations with the network and blockchain database which use other components. EX2010, ¶111. In view of these teachings a POSITA 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. EX2010, ¶111.

At his deposition Petitioner's expert conceded that his declaration did not identify which component in a spondooliestech server is connected to the network. EX2022, 66:4-8. The expert also confirmed that other than performing crypto mining operations, he was not aware of any other functions that the ASIC chip in a spondooliestech server could perform. EX2022, 61:1-6.

Moreover, Petitioner's expert confirmed 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:

Q. And the controller is what's communicating with the network, right?

A. Correct.

Q. And this network, that would include the blockchain database, right?

A. The blockchain database would be on the network in a distributed fashion. It would also be in part or in whole on the individual nodes.

Q. So again just focusing on this portion of the specification at 17, 15 through 21, as described here, 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, right?

A. Correct. According to this specification.

Q. And that again, that's consistent with what you would see in let's say a Spondoolies-Tech SP31 or SP35 server, right?

A. So an SP31 SP35 server has hashing boards. They have a power supply. They have a controller. So in that manner, the description of the server here, which is being called a mining processor, is consistent with a Spondoolies SP35.

EX2022, 65:6-66:3 (emphasis added).

The Szhmigielski reference likewise describes mining ASICs as “microprocessors built for a single function,” that is “to perform the SHA-256 hash function that is used in Bitcoin.” EX1009, 76. Thus, a POSITA would understand that functions other than computing the hash function are performed by other components. EX2010, ¶112. Mining was typically performed with mining software such as cgminer. EX1009, 30; EX2010, ¶112. In the case of a prior art ASIC miner, the software ran on a controlling computer and established communication with the network and blockchain database. EX1009, 77, 82. The software constructed a candidate block that is then hashed. EX1009, 30. A POSITA would understand that in an ASIC miner the hashing was offloaded to ASIC integrated circuits which are specifically designed solely for this purpose. EX2010, ¶112. “When a successful hash is found, the software submits the solved block to the network for verification.” EX1009, 30. Thus, considered from the software perspective, it is the mining software on a controlling computer and not the ASIC that communicated with the blockchain database through network communication components. EX2010, ¶112. These teachings further illustrate that a POSITA

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. EX2010, ¶112.

b. Claim 24

Petitioner relies on its discussion of claim 1 for these limitations of claim 24. Petition, 44. Accordingly, they are not met by the proposed combination for the same reasons as claim 1.

B. Ground 2

1. No Motivation to Combine or Reasonable Expectation of Success

Ground 2 combines the primary references of Ground 1 (Dickerson and CryptoKube) with Belady-989. Petition, 50-52. Petitioner does not offer any additional rationales for combining Dickerson and CryptoKube. Accordingly, there would be no motivation to further combine the references in Ground 1 and Belady-989 for at least the same reasons as Ground 1 above. EX2010, ¶¶115-24.

Moreover, as with Ground 1, Petitioner has not addressed reasonable expectation of success, contrary to the particularity requirement of 35 U.S.C. § 312(a)(3).

The same secondary considerations of non-obviousness factors discussed for Ground 1 above apply to this ground.

2. Ground 2 Combination Does Not Disclose Challenged Claims

a. Claims 1, 24

Petitioner relies on CryptoKube in the same manner as Ground 1 and does not provide any additional analysis for limitations [1c_i] and [1c_iii] regarding “mining processor.” Petition, 52-53. Accordingly these limitations and the corresponding limitations in claim 24 are not met for the reasons stated for Ground 1 above. EX2010, ¶125.

b. Claims 10-13⁵

Petitioner's analysis of claim 10 is a two-sentence conclusory statement. *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1125 (Fed. Cir. 2000) (Motivation to combine requires a “clear and particular” showing; “broad conclusory statements about the teaching of multiple references, standing alone, are not ‘evidence.’”)

Petitioner alleges that CryptoKube's DCIM software “can be customized to monitor and control the individual miners,” citing EX1023, 0:00:08. Petition, 57. However, the video EX1023 does not disclose that this software *controls* the servers (as opposed to monitors) or that there is hardware that can be controlled by DCIM to “turn[] off a certain number of mining processors” as alleged by

⁵ Claims 14 and 15 depend respectively on claims 13 and 10 and are not obvious for at least the same reasons as the claims on which they depend.

Petitioner. EX2010, ¶126. For example, there is no evidence that CryptoKube's PDU (power distribution unit) could be remotely controlled to selectively power off miners. Therefore, the modification to CryptoKube suggested by Petitioner would involve significant changes to both hardware and DCIM software. [EX2010, ¶126. Petitioner has not shown that these modifications were within the ordinary skill or could be accomplished without undue experimentation and with a reasonable expectation of success.

Moreover, there was no motivation for a POSITA to attempt this modification. EX2010, ¶127. As discussed above, the conventional knowledge in the art before the invention of the '372 patent held that industrial ASIC miners like CryptoKube should operate at maximum uptime and full hashrate. EX2010, ¶127. Accordingly, if sufficient power was not available, a POSITA expected an industrial miner like CryptoKube to shut down all of the mining hardware to prevent potential damage. EX2010, ¶127. For example, mining servers could be damaged by voltage and frequency drop in the power supply. Likewise, unlike typical data center servers, ASIC miners generated intense heat in a small form factor such that the failure or reduced flow rate of CryptoKube cooling in case of insufficient power could damage the miners. This would lead a POSITA to turn off all the miners rather than modulate the load by selectively turning on or off some

of them as suggested by Petitioner.⁶ For this reason there was no need for hardware or software support for the kind of event-driven selective turn-off as suggested by Petitioner. EX2010, ¶127.

In this regard an industrial miner like CryptoKube or Polivka differed from a data center in Belady-989 that would throttle down or offload processing. EX1011, Abstract. Petitioner relies on Szhmigielski's statement that "[i]ndustrial miners face almost the same issues as data centers" for the motivation to combine. Petition, 54; EX1009, 103. However, Petitioner ignores Szhmigielski's teaching that, in addition to common challenges, "largescale Bitcoin mines face numerous unique issues." EX1009, 105; EX2010, ¶128. Unlike a data center, there was no way to offload blockchain processing from a CryptoKube. EX2010, ¶128. Moreover, unlike a data center, before the invention of the '372 patent a POSITA expected industrial miners to operate in an all-or-nothing fashion for the reasons discussed above. Accordingly, a POSITA would not consider Belady-'989's

⁶ Petitioner has not suggested that turning off all the mining processors at the same time meets the "modulate a power load level" limitation in claims 10 and 11 or "increasing or decreasing a maximum number of mining processors" limitation in claim 11. A POSITA would not understand a total shutoff of a CryptoKube to meet these limitations. EX2010, ¶128.

solution of throttling down or offloading applicable to industrial miners like CryptoKube. EX2010, ¶128. “As such, the ground is deficient as obviousness concerns whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications of prior art to arrive at the claimed invention.” *Cambrios Film Solutions Corporation v. C3Nano Inc.*, IPR2019-00655, Paper 17 at 31 (Aug. 9, 2019) (internal citation omitted).

Petitioner's proposed modifications to DCIM software, even if implemented, would control whether a spondooliestech miner is on or off. Petition, 57. The claims at issue require “increasing or decreasing the mining activity of the mining processor,” (claim 10) which Petitioner's expert read on the ASIC chip and not the miner. A POSITA would expect individual ASIC chips to be un-addressable by CryptoKube's DCIM and Petitioner has not presented any evidence to the contrary. EX2010, ¶129. Therefore, CryptoKube's DCIM software could not turn on or off ASIC chips within a miner (claim 11) or increase or decrease the mining activity of an ASIC chip (claim 10) in some other unspecified manner. *Id.*

Finally, a POSITA in the oil and gas industry was not a POSITA in the crypto mining industry and vice versa. EX2010, ¶130. (Petitioner's expert conceded that he was not aware of any persons of ordinary skill in the Bitcoin mining industry who were also a POSITA in the oil and gas industry. EX2022, 16:23-17:3.) An oil and gas industry POSITA who could, *arguendo*, attempt to

modify Dickerson “to use Belady-’989’s gas supply shock absorber,” Petition, 51, was not a POSITA in the crypto-mining industry. Therefore, they could not attempt to reprogram DCIM software in the CryptoKube miner as suggested by Petitioner without undue experimentation and with a reasonable expectation of success for this additional reason. EX2010, ¶130.

c. Claims 35-37

These claims are substantially similar to claims 10-12 and are not obvious for the same reasons. EX2010, ¶131.

C. Ground 3

1. Ground 3 Does Not Meet Particularity Requirement

The Board correctly concluded in the Institution Decision “that rather than present Ground 3 with particularity, the Petition simply refers to Grounds 1 and 2 with inconsistent results,” PGR2023-00039, Paper 14 at 51, and, therefore “Petitioner has not demonstrated that it is more likely than not that it would prevail on its assertions” in Ground 3. *Id.*

Ground 3 fails to identify “with particularity ... the evidence that supports the grounds for the challenge to each claim,” 35 U.S.C. § 312(a)(3), because Petitioner does not explain which parts of the references it is combining and how the combination is accomplished. For example, Petitioner’s analysis of limitation 1[b] implies that it is relying on Boot for the “generator” limitation. Petition, 69-70. If that is the case, the Petition is silent on what role, if any, Dickerson’s

generator or other components play in the proposed combination. In this regard, for limitation 1[c], which recites “blockchain mining devices connected to the generator,” the Petition cites to Ground 2 without any further explanation. Petition, 70. However, Ground 2 does not include Boot so it is unclear whether Petitioner is relying on Boot's, Dickerson's or Belady-989's generator for element 1[c]. EX2010, ¶132. The failure to identify which specific components of the references are being combined therefore leads to confusion that Section 312(a)(3) is meant to prevent.

2. No Motivation to Combine or Reasonable Expectation of Success

Ground 3 combines the primary references of Ground 1 (Dickerson and CryptoKube) and Ground 2 (Belady-989) with Boot. Petition, 67-68. Petitioner does not offer any additional rationales for combining Dickerson, CryptoKube and Belady-989 beyond those discussed above for Grounds 1 and 2. Accordingly, there would be no motivation to further combine the references in Grounds 1 and 2 with Boot for at least the same reasons as above. EX2010, ¶133. Moreover, as with those grounds, Petitioner has not addressed reasonable expectation of success for the combination with Boot, contrary to the particularity requirement of 35 U.S.C. § 312(a)(3). The same secondary considerations of non-obviousness factors discussed for Ground 1 above apply to this ground.

Petitioner has not shown a motivation to combine for the following

additional reasons. Boot teaches a specialized system “to provide electrical power to an electric submersible pumping system positioned in a well that produces petroleum products.” EX1012, 1:50-53. EX2010, ¶134. Boot’s specialized system is unlike Dickerson’s generator that supplied power for the entire oil or gas production facility. EX1005, ¶11; EX2010, ¶134. The small number and power requirements of the pump-related loads supplied by Boot “cause the power demand to be relatively volatile.” EX1012, 2:55-58. To keep the genset engine from over-revving when a load goes offline, Boot proposed a load bank 110 “activated to take-up the excess power and stop the engine 112 from racing.” EX1012, 3:8-10; EX2010, ¶134. Boot described the load bank as optional even in its specialized system. EX1012, 2:27-28.

Boot is not directed to full-facility generators like Dickerson. A POSITA would understand that a load bank was unnecessary in Dickerson’s system (and therefore an unneeded expense) because it powered a larger number of loads and included other mechanisms for soaking up excess power. EX2010, ¶135. For example, Dickerson teaches adding a gas chiller where “only a small portion of the raw natural gas generated by the facility is needed to power the facility.” EX1005, ¶22. Unlike a load bank that dissipates energy unproductively, “the chiller is powered by electricity from the generator, and the chiller’s consumption of electricity furthers the goal of reducing flaring, since the added electricity demand

enables the generator to unitize more methane.” *Id.* Thus, instead of dissipating energy in a load bank, the chiller soaked up electricity, reduced flaring by keeping up methane consumption, and produced NGLs (natural gas liquids) that could be sold offsite. EX1005, ¶22; EX2010, ¶135. To a POSITA the differences between Boot and Dickerson would not be a mere matter of relative desirability of Boot’s solution. Rather, a POSITA would consider Boot’s load bank to be entirely unnecessary in Dickerson’s system. EX2010, ¶135. Therefore, a POSITA would not seek to combine Boot’s load bank with Dickerson. *Id.*

D. Ground 4

1. No Motivation to Combine or Reasonable Expectation of Success

Petitioner failed to demonstrate that a POSITA would have been motivated to combine references for this Ground for at least the following reasons.

Like the Dickerson-based grounds considered above, Ground 4 relies on a hindsight-driven combination of gas processing equipment (MAGS) and a crypto miner (Polivka). The relevant aspects of these references as presented by Petitioner are similar to Dickerson and CryptoKube such that many of the same reasons would lead a POSITA to *not* combine these references. EX2010, ¶137. For example, like CryptoKube, Polivka was a containerized industrial cryptocurrency miner. *Id.* MAGS, like Dickerson, conditioned flare gas as fuel for a generator powering the oil and gas facility. EX1013, 2; EX2010, ¶137. A comparison of the

Petitioner's motivation to combine sections for Grounds 1 and 4 reveals that Petitioner has merely substituted MAGS for Dickerson and Polivka for CryptoKube while repeating almost verbatim the same flawed rationale based on Szmigielski. Petition, 19-20, 81-83.

Accordingly, a POSITA lacked a motivation to combine MAGS and Polivka for the same reasons as Dickerson and CryptoKube. EX2010, ¶138. Likewise, the same secondary considerations of validity established for Dickerson Grounds 1-3 above apply equally and in the same manner to the MAGS-based Grounds 4 and 5.

Moreover, a POSITA would consider MAGS to be even less suitable for the proposed combination than Dickerson. This is because there is no teaching that MAGS could produce sufficient excess electrical output to power Polivka even occasionally. EX2010, ¶139. As described by Petitioner, MAGS separated input gases 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." Petition, 81-82. Thus, all the energy produced by MAGS – whether in the form of gas or electric power – was already spoken for. Some of the output was separated from the gas stream so it could be shipped for sale to a remote counterparty; some energy went to power the operation that produced the input gas; and the rest went to power MAGS itself. EX1013, 2; EX2010, ¶139.

Therefore, Petitioner is incorrect in stating that "a POSITA would have

understood that MAGS can produce cheap or free electricity using flare gases” because the electrical output supplied either MAGS itself or the oil or gas production equipment. Petition, 82; EX2010, ¶140. Accordingly, aside from Petitioner’s conclusory statement, there is no evidence that MAGS was suitable to power a notoriously power-hungry external load such as Polivka’s bitcoin miner. *Id.*

A POSITA would consider even the best-case electrical output in MAGS as insufficient for Polivka’s miner. EX2010, ¶141. For example, the Young reference describes a MAGS-200 system consuming gas of a composition typical for the Bakken formation. EX1014, ¶¶143-145. The system was projected to produce about 450kWh of electrical power per day. EX1014, ¶144. The Polivka reference provides an example of Polivka’s miner consuming 120.3kW. EX1015, 25. At that power level Polivka’s miner would consume the entire daily electrical output of MAGS in less than four hours even assuming an extremely unlikely scenario where none of the power was used to power MAGS or wellhead equipment. EX2010, ¶141.

Operating an expensive crypto miner for a few hours every day was and is prohibitively uneconomical. EX2010, ¶142. Like the \$60,000 CryptoKube, a POSITA understood the even more powerful (100+kW) Polivka to require a full hashrate and minimum downtime. EX2010, ¶142. Therefore, a POSITA would not

be motivated to combine Polivka with an unsuitable power source in MAGS. *Id.*

In any case, evidence shows that MAGS could not supply the power necessary to operate Polivka for *any* amount of time. EX2010, ¶143. At his deposition Petitioner's expert stated that he relied on the "power generator that also runs the drilling operation" in MAGS. EX2022, 83:4-9. He then admitted that his declaration (and therefore the Petition) presented no evidence as to whether there would be enough power left over in MAGS to power a Polivka miner. EX2022, 85:14-17.

With regard to the Young reference that allegedly describes MAGS, Petitioner's expert identified the engine in par. 242 as "the one that's powering the load."⁷ EX2022, 89:8-13; EX1014, ¶242. Young teaches that this engine is rated for 150kW, but only "about 100kW" is required. EX1014, ¶242. Therefore, Petitioner's expert testified that a maximum of 50kW would be left over for this engine. EX2022, 89:17-24. This is plainly insufficient to operate Polivka's miner, which was advertised as approximately 100kW and shown operating at 120.3kW. EX1015, 1, 25; EX2010, ¶144.

A POSITA would not consider derating Polivka by running only a few

⁷ This is in contrast to the engine in Young par. 241 which "powers the MAGS system." EX2022, 89:4-7.

mining servers – it would make no sense to invest in Polivka and then derate it to use an inadequate power source like MAGS. EX2010, ¶145. There also is no indication that the power output in MAGS could be scaled without undue experimentation as that would require changes to its complex gas conditioning components (described in Young as comprising “many innovations,” EX1014, ¶173) as well as the generators. Moreover, as with Dickerson, a POSITA would not consider a separate MAGS to power Polivka because they understood MAGS was a multi-hundred-thousand dollar capital investment that would make crypto-mining cost-prohibitive compared to established power sources such as hydro. For these reasons a POSITA would have *no* expectation of success and would not consider the proposed combination.⁸ EX2010, ¶145.

2. Ground 4 Combination Does Not Disclose Challenged Claims

a. Claims 1, 24

Petitioner's analysis of claim elements [1c_i] and [1c_iii] suffers from the same defects as Ground 1. The Petition does not identify the claimed “mining

⁸ Petition's only assertion regarding reasonable expectation of success is based on testing of MAGS in North Dakota. Petition, 83. A POSITA would not be motivated to combine MAGS with a crypto miner just because MAGS had been tested because MAGS and Polivka were incompatible. EX2010, ¶146.

processor” in the proposed combination. Petition, 84-85. However, the Petition clearly identifies “spondooliestech SP31 servers” as the claimed “blockchain mining devices:” “blockchain mining devices (e.g., Spondoolies-Tech SP31) each have a mining processor and are connected to a network interface (e.g., a modem or a router).” Petition, 84.

If spondooliestech SP31 servers in a Polivka container are the plural “blockchain mining devices” required by the independent claims, then some unidentified component of the spondooliestech SP31 server must be the “mining processor.” These are distinct claim terms as understood by a POSITA.

However, Petitioner's expert also identified the very same spondooliestech SP31 mining servers as a “mining processor.” EX1004, ¶314. In PGR2023-00052, Petitioner's expert stated that “[i]f the term ‘blockchain mining devices’ refers to mining servers, then the term ‘mining processor’ cannot also mean mining servers.” EX2021, ¶60. Accordingly, his identification of a spondooliestech SP31 mining server as both a blockchain mining device (EX1004, ¶306) and mining processor (EX1004, ¶314) in PGR2023-00039 contradicts his opinion in the PGR2023-00052 proceeding. These conclusory and contradictory statements make the Petition incomprehensible.

Petitioner's failure to identify a specific “mining processor” is impermissible. *Intelligent Bio-Systems*, 821 F.3d at 1369 (“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.”) (internal quotations omitted); 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b)(5). The Board should not have to “infer every possible permutation of a petitioner’s argument.” PGR2023-00039, Paper 14 at 51, *citing Microsoft*, 860 Fed. App’x at 713. Yet this is precisely what Petitioner’s vague and inconsistent allegations require.

If 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. EX2010, ¶151.

If the “mining processor” is the spondooliestech server itself then some other devices must be the “blockchain mining devices” of the claims. What they may be is not disclosed in the Petition or by Petitioner’s expert. There is certainly no “identi[fication] with particularity,” *Intelligent Bio-Systems*, 821 F.3d at 1369, of anything other than spondoolisestech servers as the “blockchain mining devices” and no analysis of why such an unidentified combination would be obvious.

Petitioner relies on its discussion of claim 1 for these limitations of claim 24. Petition, 96-97. Accordingly, they are not met by the proposed combination for the same reasons as claim 1.

E. Ground 5

1. No Motivation to Combine or Reasonable Expectation of Success

Ground 5 combines the primary references of Ground 4 (MAGS and Polivka) with Belady-'989. Petition, 99-100. Petitioner does not offer any additional rationales for combining MAGS and Polivka beyond those discussed above for Ground 4. Accordingly, there would be no motivation to further combine the references in Ground 4 and Belady-989 for at least the same reasons as Ground 4 above. EX2010, ¶154. Moreover, as with Ground 4, Petitioner has not addressed reasonable expectation of success, contrary to the particularity requirement of 35 U.S.C. § 312(a)(3). The same secondary considerations of non-obviousness factors discussed for Ground 1 above apply to this ground.

In Ground 5, Petitioner alleges that it was obvious to combine Belady-989's gas shock absorber with the "MAGS mobile power generation system" and the "Polivka mobile Bitcoin miner." Petition, 100. The purported motivation for this further combination is to "improve the energy usage efficiency." *Id.*

Petitioner does not explain how a POSITA was supposed to combine the gas shock absorber system with MAGS, nor does Petitioner address the reasonable

expectation of success in even a cursory fashion.

In fact, no reasonable expectation of success was possible because a POSITA would conclude that Belady's gas shock absorber was incompatible with MAGS. For example, Belady-989 taught shutting off gas flow to the generator when supply gas pressure rises: "were the gas supply 110 to experience a positive gas pressure spike, the gas pressure sensor 171 of the pressure regulating valve 170 could detect such a high-pressure and could trigger the gas shutoff valve 171 to stop the flow of pressurized gas to the gas-to-electricity converter 180." EX1011, ¶23.

If Belady's system was connected to MAGS as proposed in Ground 5, a POSITA would understand that the sudden loss of feed gas could be substantially detrimental to MAGS operation. EX2010, ¶158. This is because inlet gas flow rate and system operating pressure were two "key" system parameters in MAGS. EX1014, ¶16. MAGS required the use of specialized flow controllers and valves to carefully manipulate these parameters to achieve the desired methane number of the dry gas stream. EX1014, ¶18. Young further noted that MAGS required its inventors to "carefully select[] the process operations and process parameters." EX1014, ¶167. The sudden loss of gas pressure caused by Belady-989 gas shock absorber operation during a positive pressure spike could disrupt MAGS' carefully selected and adjusted gas flow and system pressure process parameters and even

damage the MAGS equipment. EX2010, ¶158.

Accordingly, a POSITA would understand that at the very least an undue amount of experimentation and changes to MAGS and Belady-'989 would be required to determine whether these systems could operate together. The outcome would be uncertain at best because MAGS was so dependent on controlling gas flow rates. In any case, combining Belady-989 and MAGS would require a volume of experimentation and process knowledge beyond the level of one of ordinary skill. EX2010, ¶159.

2. Ground 5 Combination Does Not Disclose Challenged Claims

a. Claims 1, 24

Petitioner relies on Polivka in the same manner as Ground 4 and does not provide any additional analysis for limitations [1c_i] and [1c_iii] regarding “mining processor” and “blockchain mining devices.” Petition, 101-102.

Accordingly these limitations and the corresponding limitations in claim 24 are not met for the reasons stated for Ground 4 above. EX2010, ¶160.

b. Claims 10-13⁹

Petitioner's conclusory analysis of claims 10-13 is substantially similar to Ground 2 with the substitution of Polivka for CryptoKube. Petition, 103-105. Accordingly, these claims are not unpatentable for the same reasons as Ground 2. EX2010, ¶161.

Petitioner alleges that a "POSITA would have found it obvious to control power load level of Polivka (e.g., by turning off a certain number of mining processors) using Belady- 989's method based on input from Belady-989's tank pressure sensor." Petition, 103. However, there is no evidence that Polivka had hardware and software that would permit this modification without undue experimentation and with a reasonable expectation of success. EX2010, ¶162.

Moreover, there was no motivation for a POSITA to attempt this modification. EX2010, ¶163. As discussed above, the conventional knowledge in the art before the invention of the '372 patent held that industrial ASIC miners like Polivka should operate at maximum uptime and full hashrate. *Id.* Accordingly, if sufficient power was not available, a POSITA expected an industrial miner like Polivka to shut down all of the mining hardware to prevent potential damage.

⁹ Claims 14 and 15 depend respectively on claims 13 and 10 and are not obvious for at least the same reasons as the claims on which they depend.

EX2010, ¶163. For example, mining servers could be damaged by voltage and frequency drop in the power supply. Likewise, unlike typical data center servers, ASIC miners generated intense heat in a small form factor such that the failure or reduced flow rate of Polivka cooling in case of insufficient power could damage the miners. This would lead a POSITA to turn off all the miners instead of modulating the load by increasing or decreasing mining activity (claim 10) and by selectively turning on or off some miners (claim 11). For this reason there was no need for hardware or software support for the kind of event-driven modulation by selective turn-off suggested by Petitioner and no motivation to make the modification. EX2010, ¶163.

In this regard an industrial miner like Polivka differed from a data center in Belady-989 that would throttle down or offload processing. EX1011, Abstract. Petitioner relies on Szhmigielski's statement that "[i]ndustrial miners face almost the same issues as data centers" for the motivation to combine. Petition, 100; EX1009, 103. However, Petitioner ignores Szhmigielski's teaching that, in addition to common challenges, "largescale Bitcoin mines face numerous unique issues." EX1009, 105. Unlike a data center, there was no way to offload blockchain processing from Polivka. EX2010, ¶164. Moreover, unlike a data center, before the invention of the '372 patent a POSITA expected industrial miners to operate in an all-or-nothing fashion for the reasons discussed above.

Accordingly, a POSITA would not consider Belady-'989's solution of throttling down or offloading as applicable to industrial miners like Polivka. EX2010, ¶164.

Finally, as discussed above for Ground 2, a POSITA in the oil and gas industry was not a POSITA in the Bitcoin mining industry and vice versa. EX2010, ¶165. An oil and gas industry POSITA who could, *arguendo*, attempt to modify MAGS "to use Belady-'989's gas supply shock absorber," Petition, 100, was not a POSITA in the Bitcoin industry. Therefore, they could not attempt to modify the Polivka miner as suggested by Petitioner without undue experimentation and with a reasonable expectation of success for this additional reason. EX2010, ¶165.

c. Claims 35-37

These claims are substantially similar to claims 10-12 and are not obvious for the same reasons. EX2010, ¶166.

V. GROUND 6: THE CLAIMS RECITE PATENT ELIGIBLE SUBJECT MATTER

The Board instituted post-grant review as to Petitioner's challenge on Ground 6 as to challenged claims 1-4, 7-12, 15-30, 34-37, and 40 because the Board had already determined to institute the review as to other previously presented grounds. PGR2023-00039 Paper 14 (Institution Decision) at 58. In doing so, the Board noted that during prosecution the Examiner expressly stated "that the claimed invention amounts to significantly more than a judicial exception or an abstract idea" and that "the claimed invention demonstrates a practical

application' because the '372 patent's Specification 'clearly teaches and describes blockchain mining at [a] hydrocarbon facility.'" *Id.* Given the subject matter of the '372 patent, Petitioner predictably cannot explain what is abstract about a generator running on a continuous flow of flare gas to produce electricity powering blockchain mining devices having one or more mining processors and a network interface to communicate with a blockchain database. It is hard to fathom a more practical application of concrete elements.

Instead, Petitioner plainly misreads the '372 patent. For one, Petitioner 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. EX2010, ¶169. Petitioner also ignores that the mining of blockchain is energy intensive requiring multiple mining processors among the recited blockchain mining devices. *Id.* Clearly, this machine is a meaningful technological and engineering contribution that fits within the statutory categories of subject matter appropriate for a patent. 35 U.S.C. § 101; Manual of Patent Examining Procedure ("MPEP") at § 2106.03, subsection III, Step 1 ("Is the claim to a process, machine, manufacture or composition of matter?"). The Petition falls short of showing that the claims are ineligible at each step of the analysis. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 217-18 (2014) (citing *Mayo Collaborative*

Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 75-77 (2012)); EX2010, ¶¶168,171,173.

Petitioner violates the bedrock principles guiding the application of 35 U.S.C. § 101, namely “determining what the inventor has invented by reviewing the entire application disclosure and construing the claims” MPEP § 2106.04, subsection II, Step 2A. Instead, Petitioner shreds the invention by arguing “any means of generation using combustible gas and any computerized means of blockchain mining are claimed” and repeatedly suggests that the sum total of Upstream’s invention is represented by the delivery (or “co-locating”) of a generator and a standard computer to a remote oil facility. Petition, 1, 5-6, 115, 117. But the independent claims confirm that more is recited than simply the use of natural gas to power a blockchain mine. Claims 1 and 24 recite 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. EX2010, ¶173. These claims recite a concrete, physical machine components that have express practical application within a hydrocarbon facility. The claims are not abstract at all.

Even if the Board were to adopt Petitioner’s oversimplified view of the

claims, the invention clearly discloses meaningful inventive steps that require significantly more than Petitioner's disjointed abstract idea. See MPEP § 2106.05. The 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. *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 217 (2014)(explaining that “in applying the § 101 exception, we must distinguish between patents that claim the ‘building blocks’ of human ingenuity and those that integrate the building blocks into something more.”) (*quoting Mayo*, 566 U.S. at 89 (1971)); EX2010, ¶¶171,178. The record presented by the Petition and its declarants falls far short of showing that any of the challenged claims are directed to ineligible subject matter.

A. Step 2A, Prong One: The '372 Patent Claims Are Not Directed To An Abstract Idea

The claims cannot be distilled down simply to “using natural gas to power a blockchain mine” as Petitioner alleges. Petition, 113. This articulation ignores the claims' recitation that the source of combustible gas is “a facility selected from a group consisting of a hydrocarbon production, storage, or processing facility.” EX1001, claims 1 & 24. It ignores that the generator receives combustible gas as a “continuous flow of combustible gas.” *Id.* It ignores the claims' recitation of “blockchain mining devices” that “each have a mining processor connected to a

network interface” and that each “mining processor” must be “adapted to mine transactions associated with the blockchain database.” *Id.* The requirement that the challenged claims include adaptations to mine transactions associated with the blockchain database pervades the claims including that the mining processors include blockchain mining circuitry configured with mining algorithms, such as a cryptographic hashing algorithm. EX1001, 13:49-52; EX2010, ¶172. Both as separate elements, and as combination, the challenged independent claims do not simply cover an abstract idea. *Id.* Thus, in addition to disregarding the claim language on an element-by-element basis, the Petition fails to treat the claimed combination as a whole. *See Mayo*, 566 U.S. at 80 (examining “the process as a whole”).

The Petition's analysis of the claims is incomplete in other ways. To provide additional predictability in the application of the Supreme Court's two-part test, the Office published guidance on the application of § 101. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (the “2019 Revised Guidance”); Update: Subject Matter Eligibility (Oct. 17, 2019)(the “October 2019 Update”) now promulgated in MPEP § 2106. The Office's published guidance is applicable to this proceeding. 2019 Revised Guidance, at 51 (“All USPTO personnel are, as a matter of internal agency management, expected to follow the guidance.”). Yet, the Petition and supporting declaration do not

attempt to apply the rubric outlined in the USPTO's § 101 guidance which is an independent basis to find the challenged claims not unpatentable as to Ground 6.

The Office's guidelines distill abstract ideas based on the relevant case law into three enumerated categories: (1) mathematical concepts, (2) methods of organizing human activity, and (3) mental processes. MPEP § 2106.04(a). The challenged claims of the '372 patent do not fall within any of these categories, and the Petition does not allege otherwise. "If the identified limitation(s) do not fall within any of the groupings of abstract ideas, it is reasonable to find that the claim does not recite an abstract idea [and] [t]his concludes the abstract idea judicial exception eligibility analysis" *Id.* The challenged claims are analogous to the examples of claims that do not recite abstract ideas provided by the Office, including the example of "a washing machine comprising a tub, a drive motor operatively coupled to the tub, a controller for controlling the drive motor, and a housing for containing the tub, drive motor, and controller." MPEP § 2106.4(a)(1). Thus, even if Petitioner's disembodied articulation of the alleged idea of the claims were accepted, the Board should still deny institution as the idea falls outside the categories of abstract ideas distilled from the case law.

Finally, Petitioner's arguments that the challenged claims preempt "any innovation within the broad field of using field gas to power any kind of blockchain computer" is blatantly inconsistent with Petitioner's articulation of the

alleged abstract idea of “using natural gas to power a blockchain mine.”

Apparently, Petitioner does not dispute that the challenged claims do not preempt the alleged abstract idea of “using natural gas to power a blockchain mine.”

Moreover, the recited limitations of the independent claims confirm that “using field gas to power any kind of blockchain computer” is also not preempted. The independent claims require, for example, that the system and method include multiple (not only one) “blockchain mining devices” that each have one or more mining processors and “a network interface” to communicate with “blockchain database [that] is a distributed database” that “stores transactional information for a digital currency.” EX1001, claims 1 & 24. The claims are not directed to just “any kind of blockchain computer,” and are instead focused on “mining processors ... adapted to mine transactions” for “digital currency.” Petitioner’s arguments regarding preemption are again premised on disregarding the claim language.

B. Step 2A, Prong Two: The '372 Patent Claims Recite A Practical Application

The challenged claims when taken as a whole are clearly integrated into a practical application. “[T]he analysis should take into consideration all the claim limitations and how those limitations interact and impact each other when evaluating whether the [alleged abstract idea] is integrated into a practical application.” MPEP § 2106.04(d), subsection III.

The Petition skips this inquiry, omitting any examination of Prong Two of

Step 2A. The challenged claims go far beyond “using natural gas to power a blockchain mine.” Though not exhaustive, 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. EX2010, ¶173. It 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. This is a more than sufficient showing that the independent claims embody a practical application of technology, especially where the Petition did not perform any analysis of whether the challenged claims recite a practical application under Step 2A, Prong Two.

C. Step 2B: The Claims of The ’372 Patent Include Inventive Concepts Beyond Using Natural Gas To Power A Blockchain Mine

The Petitioner predicates its determination regarding the presence of inventive concepts within the claims on misreading the claims, treating each element of each claim as unconnected and orphaned, and disregarding the

invention as a whole. The Petition fails to both consider the elements of the claims individually and in combination, and doing so confirms that the claims contain inventive concepts that were not well understood, conventional or routine. MPEP § 2106.05.

Though the Petition's analysis is razor thin, the little analysis that is provided is inconsistent in meaningful respects. For example, the Petition initially argues that the claims "do[] not even require the computers be located at or near a [hydrocarbon] facility," yet in the next paragraph the Petition compares the claim to "geographically locating any energy intensive computer process near a cheap source of energy." Petition, 116-117. In light of these inconsistent statements, the Petition's conclusion regarding the challenged claims' alleged omission of an inventive step collapses.

Of course, the Petition misapprehends the claims insofar as it contends that the claimed system and method need not be proximate to the hydrocarbon facility that is the source of the claimed "continuous flow of combustible gas." The claims themselves recite that the "generator [is] connected to the source of combustible gas" that is "produced from a ... hydrocarbon production, storage, or processing facility." EX1001, claims 1 & 24; EX2010, ¶174. Specific requirements regarding the positioning of the recited system are recited in dependent challenged claims 8 and 29, requiring that the system be necessarily "located adjacent to the facility."

By disassociating the claimed elements, the Petition errs in concluding that the claimed system need not be “be located at or near such a facility.” Petition, at 116.

Relatedly, 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. Patent Owner's Response addresses Petitioner's mistaken claim construction of “continuous flow of combustible gas” above. The '372 patent explains that “[i]n upstream production of oil and gas, natural gas may be produced ... as a by-product of oil production, for example from an oil well.” EX1001, 6:51-54; 4:62-63 (“The source of combustible gas comprises raw natural gas.”); 8:66-9:3. The '372 patent describes this source of raw gas as having a “continuous flow” that must be consumed or otherwise disposed of. *Id.*, 9:28-32. Often oil wells are remote, and with respect to the natural gas, may be “lacking in accessible infrastructure such as an external pipeline network (sales line)” *Id.*, 7:46-49; 8:49-63. The '372 patent teaches that the oil well operator is left with few desirable options to dispose of the raw natural gas, such as “venting the gas to atmosphere un-combusted [or] combusting the gas on site via flare” *Id.*, 7:56-60; 8:5-10. The '372 patent therefore directs the casinghead gas to a generator used to operate a blockchain mining device. *Id.*, 11:24-36. Thereby, “relatively less gas is wasted during operation.” *Id.*, 11:35-36. This aspect of the invention is captured in the elements

of the independent claims, which Petitioner proposes be misread such that the mere presence of any type of gas from any source, for any duration of time would suffice. Without this error, it is clear that the elements of the independent claims reveal an inventive concept that is significantly more than using natural gas to power a blockchain mine. EX2010, ¶175.

The 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. Patent Owner's Response addresses Petitioner's mistaken claim constructions of "blockchain mining devices" and "mining processor" above. The 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. EX2010, ¶176. The '372 patent recounts that "[t]he first block chain was conceptualized by Satoshi Nakamoto in 2008 and implemented the following year as a core component of the digital currency, BITCOIN...." EX1001, 11:51-55. This was not even ten years before the application leading to the '372 patent was filed. "Maintaining a blockchain database is referred to as mining, which refers to the distributed computational review process performed on each block of data in the block-chain" (*id.*, 13:5-7), wherein "[e]ach block may include the hash of the prior block ... linking the two"

to “form a chain” (*id.*, 12:32-39). With respect to the claimed mining processors, the '372 patent recommends the capability to control the “hashrate” by “changing the core voltage or the clock rate of the processor[s].” *Id.*, 13:52-58. It is the “[m]ining circuitry 130, for example integrated circuit chip, may be used to perform data mining operations, for example verifying cryptocurrency transactions.” *Id.*, 14:57-63. Far from being a generic home computer as the Petition suggests, the mining processor is described and recited as a specialized computer processor that was far from conventional at the time of the filing of the '372 patent. EX2010, ¶176.

Even the references relied upon in the Petition confirm that the claims, especially when read as the combination of elements, were far from conventional or routine. The '372 patent explains that blockchain mining operations are highly computationally and energy-intensive by design. EX1001, 13:29-36, 13:49-58. The Szmigielski reference that Petitioner identifies as pertinent prior art teaches that, in addition to being inexpensive, electrical power for crypto mining must be “*reliable*” to power “the hardware and the associated cooling systems.” EX1009, 105; EX2010, ¶177. Yet, Petitioner's other art, including particularly the Dickerson reference, teaches that its electrical power is *unreliable* because the system is located “in remote areas” where “no utility power is available.” EX1005, ¶24; EX2010, ¶177. As such, a POSITA did not view the claims as conventional or

routine, but instead would be skeptical that such a system would work reliably. *Id.* For example, even after the filing of the '372 patent, the inventor and others often encountered statements of express skepticism and criticism of what is recited in the challenged claims. EX2010, ¶¶93-99; EX2016, 6, 2-3, 8-9; EX2017, 6; EX2018, 4-5; EX2019, 15:36; EX2022, 19:3-20:10. Moreover, attempts to combine available components in an effort to embody the challenged claims would encounter difficulties far beyond anything conventional or routine in the art, including because such an attempt would draw not from one field of art, but instead from the disparate fields of the oil and gas industry versus the blockchain mining industry. EX2010, ¶130.

In fact, even after the filing of the '372 patent, Petitioner itself explained that the combination of elements in the claims were not well known or conventional at the time. As discussed above, Petitioner filed provisional U.S. patent application No. 62/713,368 in August, 2018, approximately a year and a half after the priority date of the '372 patent (and to which Petitioner's U.S. Pat. No. 10,862,307 claims priority). *See* EX2002. In the '307 specification's Background section, Petitioner described the state of the art and asserted that "there remains a need for systems and methods for generating electricity from natural gas produced from oil wells," and that "[i]t would be beneficial if such electricity could be produced and consumed on-site, for example by using it to operate power-intensive, modular

processing units... employed to mine cryptocurrency.” EX2002, 2:35-42. The ’307 summary section described as allegedly novel “convert[ing] raw natural gas into a fuel gas stream to power any number of on-site power generation modules” which in turn power “distributed computing units” that “may be adapted to mine cryptocurrency.” *Id.*, 2:45-55. Thus, a year and a half after the priority date of the ’372 patent, Petitioner confirmed that the combination of elements presented by the claims of the ’372 patent was unconventional, not routine, and not well known. Petitioner’s admissions regarding the state of in the industry in its ’307 patent should be taken over the conclusory and unsupported arguments now made by Petitioner and its expert declarants.

D. The Petition Failed to Adequately Address the Patent Eligibility of Challenged Claims 2-4, 7-12, 15-23, 25-30, 34-37 and 40

The Petition hangs its entire patent eligibility ground based on § 101 on an analysis of claim 1. Petition, at 118.

With respect to claims 2-4, 7-9, 16-23, 25-30 and 34, the Petition does not analyze any language of 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.” Petition, at 118. This is plainly insufficient and fails to meet Petitioner’s burden to perform an analysis as to each claim. These claims are meaningfully different from claim 1 and these differences are not addressed in the Petition.

For example, claims 2 and 28 recite further isolation of the system of claim 1, not only from a sales gas line, but also from any “external electrical power grid.” Similarly, claims 3 and 29 recite that the source of gas is a “remote oil or gas well” that burdens the generator to function without supportive infrastructure. Claim 9 recites that “remote wells” are located on a multi-well pad or include a satellite well. These additional restrictions place a greater burden on the “generator” and the connected “blockchain mining devices each having a mining processor” recited in claim 1 by ensuring that these machines must be functional to produce sufficient electricity to power the blockchain mining devices and that the blockchain mining devices must sufficiently load the generator to expend the generated electricity. Further, the Petition’s only argument that such isolation is merely “how the [alleged] abstract idea can be used or token post-solution limitations” doesn’t apply as such isolation must be overcome by the claimed invention.

Claims 4 and 30 recite the addition of a “combustion engine” to drive the generator, claim 18 recites that the “engine” is within portable enclosure, and claim 19 recites that the engine “comprises a turbine.” Nowhere does the Petition address the substantial issue of how a combustion “engine” or a “turbine” amounts to an abstract idea. Similarly, claim 7 recites a “unit” that is an “oil storage or processing unit;” nowhere does the Petition address the substantial issue of an “oil storage or processing unit” amounts an abstract idea.

The Petition's failure to address to claim 8 which recites that "the generator and blockchain mining devices are located adjacent to the facility" is particularly meaningful since the Petition takes the position that claim 1 "does not even require the computers to be located at or near such a facility" and attempts to leverage that allegation to support the Petition's contention that the claim 1 is conventional. Petition, at 116. The Petition's reasoning regarding claim 1 cannot be squared with the express language of claim 8, and the Petition makes no attempt to address the inconsistency.

The Petition does not contend that claim 1 is representative of claim 16 and does not provide any separate analysis of claim 16 with respect to ineligibility. Moreover, claim 16 recites the addition of "a controller ... to operate a cooling system to maintain the blockchain mining devices within a predetermined operating range of temperature." As the specification explains, the "controller" operates to "optimize the mining processors chip frequency and fans for cooling" by ramping up components such as "ventilation fan 76 and a chiller 78." EX1001, 17:25-39. Again, the provision of a "controller" and a "cooling system" to optimize the environment of the mining processors when under load meets the requirements for patent eligibility, and the Petition does not allege otherwise.

Claim 17, 20, and 21 recite requirements of a "portable enclosure" that may be "intermodal transport container" that includes "access doors," where the

enclosure is formed as “a skid” or to be “mounted on a trailer.” The Petition does not address these or similar structural (as opposed to abstract) requirements within the claims, or explain how the associated benefits provided by the portable enclosure are alleged post-solution limitations.

Claims 22, 23, 25, 26 and 27 recite “a combustible gas disposal device” and claims 23 and 27 recite diverting the continuous flow of gas to the generator or “combustible gas disposal device.” The specification teaches that, though a disposal device is wasteful and may create health concerns, that it shall remain available in the form of “an atmospheric vent or combustion device, in this case a flare 68.” EX1001, 8:3-10; 11:17-21. Again, the Petition is silent how a selectable “disposal device” is an abstract idea.

Claim 34 requires that, in addition to the network interface of claim 1, the operation of the blockchain mining devices” must “communicate wirelessly through the internet.” The Petition, again, does not address the language of dependent claim 34.

With respect to claims 2-4, 7-9, 16-23, 25-30 and 34, the Petition does not analyze any language of 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.” Petition, at 118.

The Petition treats the remaining challenged claims 10-12, 35-37, and 40 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.” Petition, at 118. The 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. More to the point, however, the Petition’s assertion that claims 10-12, 35-37, and 40 are allegedly directed to a purported abstract idea (i.e., “modulating the power load of the blockchain device”) distinct from the purported abstract idea of claim 1 (“using natural gas to power a blockchain mine”) ensures that claim 1 cannot be representative of claims 10-12, 35-37, and 40.

Moreover, the purported abstract idea of these claims does not accurately reflect the subject matter of the claims. The purported abstract idea states that these claims are directed to “modulating the load of the blockchain device,” but the language of claim 10 and claim 35, for example, “modulate[s] a power load level ... on the generator.” Claims 10 and 35 further recite how this modulation is performed, i.e., by “increasing or decreasing[,] the mining activity of the mining processor.” Thus, the Petition’s characterization of claims 10 and 35 is wrong.

Claims 11-12 and 36-37 also recite when and how the power load level on the generator is controlled, including by controlling the “number of mining

processors that are engaged in mining transactions” where there are “variations in the production rate of combustible gas.” The Petition does not address these additional significant additions conditions on the modulation of the power load level on the generator.

Claims 15 and 40 each include three separate limitations, including using the “daily minimum production rate” to set the generator to produce power in excess of that related to the “daily minimum” and using a “backup source” to make up a shortfall. The Petition does not analyze the “controller” of claim 15 responsible for setting the generator or otherwise 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.” Petitioner’s final attempt to compare a personal computer laptop suffering from a low battery to the specific application of the claimed generator connected to a continuous flow of flare gas to power blockchain mining devices that include mining processors serves only to confirm that Petitioner’s assertion of subject matter ineligibility rests on Petitioner’s faulty understanding of the challenged claims.

VI. CONCLUSION

For the reasons given above, the Board should find each of the challenged claims not unpatentable.

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CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(c) and (d), Patent Owner certifies that the word count of Patent Owner's Response Regarding Post Grant Review (exclusive of any table of contents, table of authorities, mandatory notices under § 42.8, certificates of service and word count, and list of exhibits or claim listing) as measured by Microsoft Word is 18,503 words.

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**CERTIFICATE OF SERVICE ON PATENT OWNER
UNDER 37 C.F.R. § 42.105**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b) and agreement by the attorneys listed below and the undersigned, the undersigned certifies that, on the 16th day of April, 2024, a complete and entire copy of this Patent Owner Response Regarding Post Grant Review, together with all supporting exhibits, were served on Petitioner electronically by emailing a copy of the same to the following attorneys for Petitioner:

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