

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Stephen Barbour
U.S. Patent No.: 11/574,372 Attorney Docket No.: 54598-0001PS1
Issue Date: February 7, 2023
Appl. Serial No.: 16/484,728
Filing Date: August 8, 2019
Title: BLOCKCHAIN MINE AT OIL OR GAS FACILITY

SECOND DECLARATION OF MICHAEL NIKOLAOU

I, Michael Nikolaou, declare as follows:

I. ASSIGNMENT

1. My experience and qualifications are set forth in my July 20, 2023 declaration (EX1003).

2. I have been asked to provide additional technical expert opinions, including opinions concerning the arguments and evidence in Patent Owner's Response.

3. Crusoe has specifically asked for my analysis from the perspective of a POSITA in the gas and oil industry. To the extent this declaration provides opinions on subject matter related to bitcoin mining, I am relying on the opinions of Mr. Vernon Kasdorf (EX1004 and EX1036). To that end, I am relying on Mr. Kasdorf's review and analysis of CryptoKube, Szmigielski, Kheterpal, and Polivka – which are all identified as prior art herein.

4. In preparing this Declaration, I have considered all of the materials previously submitted by both Upstream (including Exhibits 2001-2023) and Crusoe (including Exhibits 1001-1038). I have also relied on my education, training, and experience, and my knowledge of pertinent literature in the field of the '372 patent.

II. CLAIM CONSTRUCTION

a. "a continuous flow of combustible gas"

5. Upstream argues that Crusoe's proposed construction is wrong but does not state what it believes is the correct construction. POR, 6-8. The closest Upstream comes to doing so is its assertion that "[t]he 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.'" POR, 7. But this statement is both circular in that it includes the word "continuous" when attempting to define "continuous," and ambiguous in that it does not explain what the term "byproduct" means or what it includes or excludes. Given that "hydrocarbon

production” necessarily includes producing gas, or oil, or both, does Upstream’s proposed construction mean, for example, that “combustible gas” is a byproduct both of gas production and oil production? Regarding the former, given that the definition of “byproduct” is “something produced in a usually industrial or biological process in addition to the principal product” (EX1037, 1), Upstream appears to be arguing that “combustible gas” is a byproduct of producing gas, which of course makes no sense.

6. To the extent Upstream proposes that this term should be construed to require that the gas is a “by-product” (POR, 7; You depo tr, 141:1-10), Upstream’s proposed construction finds no support in either the claim language or the specification, which explicitly refers to both primary product and byproduct. EX1001, 6:51-54. The specification (including the title) repeatedly uses the term “oil **or gas well**.” EX1001, 1:28-31, 1:37-40, 3:63-4:2, 4:31-45, 8:49-51, claims 3, 9, 28 and 29. In my opinion, gas from a gas well is clearly not a byproduct. In fact, Upstream admits that claim 1 covers gas produced as a primary product. Barbour depo tr, 162:14-24 (“any oil and gas application”); You depo tr, 103:11-104:6 (“I think it covers both”), 120:5-19; 131:11-18 (“I think it should be included”). Thus, while the specification identifies byproduct casing head gas as an issue to be solved, the claim scope is not limited to gas produced as a “by-product”. You depo tr, 120:5-19, 145:20-146:14. Further, gas from commercial sales lines may be produced from either gas wells (e.g., shale gas) or oil wells. Gas flow from both gas wells and oil wells are “continuous,” and gas from oil wells is no more “continuous” than gas from gas wells.

7. While Upstream argues that this term requires the gas flow to be continuous for more than a few minutes (POR, 7), Upstream cannot identify a time limit on how long the gas flow needs to be continuous for. You depo tr, 132:17-133:20, 144:18-145:18 (“there’s no specification in this particular sentence”). This further supports Petitioner’s construction of “a flow of

combustible gas that is continuous for at least a time period (e.g., an hour, a day, a week, a month, or longer).” Petition, 6.

8. Finally, during his deposition, Dr. You proposes that this term somehow requires that the gas flow cannot be manually shut off. You depo tr, 133:22-14 (“If it’s something that we could manually adjust to turn on and turn off, I would not consider it.”). Similar to the “by-product” requirement, this construction finds no support in either the claim language or the specification. You depo tr, 139:18-25 (“Claim 1 does not state anything about a manual option.”). Contrary to what Upstream alleges, a POSITA would not have read this term to exclude manual shutting off, and would have understood that gas from a commercial sales gas line is also “a continuous flow of combustible gas.” EX1001, claim 2; Barbour depo tr, 146:10-17 (“It might.”); You depo tr, 133:10-20 (“So as long as this particular source of gas **involved** a continuous flow of combustible gas, then it will fall into this particular claim.”). Gas produced as a byproduct gas can be shut off (e.g., by the manual override), just like gas produced as the primary product. In fact, gas from commercial sales lines is also “continuous.”

III. A POSITA WOULD HAVE BEEN MOTIVATED TO COMBINE DICKERSON AND CRYPTOKUBE

9. Both gas generators and blockchain mining data centers were well-known before the priority date. Barbour depo tr, 25:9-26:16 (“the associated gas stream is commonly used by oil companies where necessary.”), 64:3-15. As discussed below, it is my opinion that a POSITA would have been motivated to combine these two.

a. The motivation to combine is not based on hindsight

10. Upstream argues that Dickerson and CryptoKube are from disparate fields and the combination is based on hindsight bias. POR, 9-11. However, people were thinking about such a combination way before the priority date. EX2022, 18:4-18 (“I spoke to multiple clients who –

who wanted to place my CryptoKube on a natural gas generator that was attached to flare gas. This was in – between 2014 and 2016”); EX1016, 1 (“mining with free natural gas”); Barbour depo tr, 246:18-247:11. In fact, Belady discloses using casing head gas to power a data center, and the ‘372 discloses nothing more than a specific use of Belady’s data center—mining cryptocurrency. EX1011, Title (“gas supply shock absorber for datacenter power generation”) and [0004] (“natural gas is a byproduct of oil drilling”); You depo tr, 39:4-9 (admitting a data center can be used for cryptomining); EX1030, 1 (“Upstream Data Inc. specializes in the design and fabrication of Ohmm bitcoin mining datacenters”).

11. Szhmigielski lists electricity cost as the first concern for industrial miners. EX1009, 88 (“Industrial miners face almost the same issues as data centers: access to relatively cheap power...”), 90 (“One of the biggest costs for Bitcoin miners is the cost for electricity.”); EX2031, 4 (“miners are rushing to Texas for cheaper electricity costs”). Thus, in search of cheap electricity, a POSITA would have been motivated to employ the cheap or free electricity generated from a gas generator Petition, 20; EX1003, 96-97; EX1004, 94-95. Contrary to what Upstream alleges (POR, 32), in the event that minor adjustments would have been needed (e.g., adjusting the generation capacity), a POSITA would have been motivated to do so with a reasonable expectation of success, because Dickerson teaches that “[t]he modular design approach of the containerized solution allows for future **design flexibility**” and “[t]hrough the addition of future engine and membrane units, additional gas can be processed and the **generation capacity can be increased.**” Dickerson, [0034]. Indeed, if more generation capacity is desired, a POSITA would have been motivated to employ a plurality of Dickerson systems, or to use a higher capacity generator.

b. Gas generators provide “reliable” energy

12. Upstream alleges that a POSITA would not have been motivated to make the proposed combination because energy generated by a gas generator is not “reliable.” POR, 34-39.

13. However, in my opinion, the term “reliable” deserves clarification, with a distinction between reliability of the electricity generators using natural gas, and reliability of gas supply to be used by such generators, as discussed in this and the next paragraph. To the extent that oil and gas production, hence gas supply to a generator, would be reliable or backup sources could be used if needed, electricity generation would be reliable as well. Indeed, Upstream admitted that any power system would be reasonably expected to eventually be reliable. You depo tr, 23:11-24 (“any power source...they could eventually be reliable”). For example, while wind and solar are not reliable by nature, they can be made reliable by including things such as a battery or a hydrogen storage. You depo tr, 22:11-25 (“they could be reliable”).

14. Upstream’s argument that power from a gas generator is “unreliable” is also wrong, considering the wide-spread use of such gas generators to power oil wells (Barbour depo tr, 25:9-26:16), and Upstream’s position that gas supply in oil wells is “continuous.” POR, 7 (“the combustible gas is continuous (albeit at varying production rates)”). Dickerson’s system and the MAGS system power the oil production facility (EX1005, Abstract), and Belady’s system powers a data center (EX1011, Abstract), and there is no reason to think the energy supply is unreliable. In fact, one of Dickerson’s advantages is “high uptime.” Dickerson, [0032]. The prior art explicitly teaches making power from a gas generator reliable by including a backup energy sources (e.g., the diesel generator in Dickerson and the gas supply shock absorber in Belady). EX1005, [0021] (“a stand-by diesel generator is provided”); EX1011, Abstract (“draw gas from storage during negative pressure spikes”). Indeed, comparing to prior art, the ‘372 patent offers no inventive measures to make gas generators more “reliable.” While boasting the importance of the “optional controller,” Upstream admitted that, in most cases, the “optional controller” was unnecessary because a POSITA knew how to setup the system to use only a “small chunk” of the available gas

supply to ensure reliability. Barbour transcript, 216:17-217:5 (“they were just taking a small chunk”). Similarly, in the Dickerson+CryptoKube combination, a POSITA would have been motivated to set up the system to only use a “small chunk” of the gas supply to ensure reliability.

Id.

IV. A POSITA WOULD HAVE HAD A REASONABLE EXPECTATION OF SUCCESS

15. Upstream alleges the Petition did not allege reasonable expectation of success. POR, 39-41.

16. It is my opinion that, a POSITA would have had a reasonable expectation of success in combining Dickerson and CryptoKube because Dickerson’s system is designed to power the oil production facility and to export excess electricity to the grid, and the combination would have required no more than plugging in an appliance to a power source. EX1005, [0039]; Petition, 19-20. Further, Dickerson teaches that “[t]he modular design approach of the containerized solution allows for future **design flexibility**” and “[t]hrough the addition of future engine and membrane units, additional gas can be processed and the **generation capacity can be increased.**” Dickerson, [0034]. In the event that minor adjustments are needed (e.g., adjusting the generation capacity), a POSITA would also have had a reasonable expectation of success in making such adjustments.

V. UPSTREAM FAILS TO ESTABLISH THE REQUIRED NEXUS FOR SECONDARY CONSIDERATIONS

a. No presumption of nexus

17. In my opinion, Upstream’s products including the Hash Generator and the Hash Hut are not “coextensive” with the claims at issue. Upstream’s own patent, US11659682, covers features in the cooling system of Upstream’s products. EX1024 claim 1; Barbour transcript, 132:11-133:6 (“many of the -- some of the early systems, like, had this kind cooling system”). Another Upstream patent, US11907029, covers the “passive heat recirc for cold climates” feature

of Upstream’s products. EX1025, claim 1; Barbour transcript, 233:16-234:8 (explaining that the ‘029 patent covers the “passive heat recirc for cold climate” feature). As shown below in Upstream’s marketing material, eight features (including heat recirc) were listed as “why our loadcenters outperform the competition,” or in other words why they are critical:



EX1026, 2 (annotated). By comparison, the claimed invention of the ‘372 patent (e.g., the combination of a gas generator and a blockchain data center) is found nowhere in Upstream’s marketing materials. Thus, Upstream’s products are not “coextensive” with the claims at issue, and the presumption of nexus does not apply.

b. Commercial success

18. Upstream asserts that the alleged “commercial success” of Upstream’s products support a finding of non-obviousness. POR, 19-22. However, Upstream failed to show nexus—that the claimed invention of the ‘372 patent is the reason of the alleged “commercial success.”

19. Contrary to what Upstream alleges, Upstream's products do not embody claims 1 and 24. As evidence of commercial success, Mr. Barbour counted 284 units sold from 2021 to the date of the POR. POR, 22. However, at least one third of these 284 units were single device deployments (i.e., a system containing only a single Hash Generator or Hash hut) that do not meet claim 1, a fact admitted by Upstream's expert. POR, 22 ("approximately 219 (~66%) were deployed in multi-system configurations"); Barbour transcript, 156:9-161:20, 168:20-169:3; You transcript, 153:10-154:7 (explaining that a single deployment does not meet claim 1—"this photo does not meet the limitation"). Further, an unknown number of Upstream's products were deployed to utilize power from either the electric grid or sales gas lines. Barbour transcript., 148:5-150:9 (explaining 36-100 customers connected Upstream's products to the electric grid—"I would guess we are under a hundred Hash huts sold where the customer applied it to a utility connect"), 151:5-10 (explaining "at least some customers" have connected Upstream's products to sales gas lines). According to Upstream, these electric grid and sales gas line based deployments do not embody claim 1 either. You transcript, 104:21-106:8 ("a commercial sales line, which is not a hydrocarbon production, storage, or processing facility"), 107:16-109:7 ("A power grid is different from a power generation facility"); Barbour transcript., 96:15-98:2 ("probably does not embody claim 1").

20. Moreover, Upstream's website list eight features as "why our loadcenters outperform the competition." EX1026, 2 and EX1027, 2. At least one of them, the "passive heat recirc for cold climates" feature, was patented in Upstream's patent US11907029. Barbour transcript, 233:16-234:8. Thus, according to Upstream's own website, the alleged "commercial success" is attributable to either non-patented features or features patented in other patents. Indeed,

the claimed invention of the ‘372 patent (e.g., the combination of a gas generator and a blockchain data center) is found nowhere in Upstream’s marketing materials.

21. Further, Upstream’s alleged commercial success may be attributable to numerous other reasons such as marketing efforts, increasing electricity costs, increasing computational efforts required for bitcoin mining, and increasing bitcoin price. Indeed, Upstream’s alleged commercial success may well be attributable to increasing electricity costs because the computation efforts required for bitcoin mining increases year-over-year and mining one bitcoin using the same device requires more and more electricity. You transcript, 57:14-58:6. Also, while Upstream asserts, without evidence, that the alleged “commercial success” was not driven by bitcoin price, its sales appear to have increased dramatically with the bitcoin price surge in 2021. POR, 21-22 (explaining 1 unit sold in 2017, 2 units sold in 2018, 10 units sold in 2019, 32 units sold in 2020, and 284 systems sold from 2021 to the date of the POR); EX1038, 3. Thus, at least some of the alleged commercial success seems to be attributable to the bitcoin price surge in 2021.

c. Long-felt unmet need

22. Upstream alleges that there was a long-felt unmet need in the industry regarding how to utilize byproduct gas from oil wells, and this need supports a finding of non-obviousness. POR, 22-25. Upstream is wrong because, as explained below, (1) there was no unmet need; and (2) the alleged unmet need is not tied to the claims at issue (i.e., no nexus).

23. In my opinion, there was no unmet need in utilizing byproduct gas from oil wells. It was common practice for oil and gas companies to employ on-site gas generators to utilize casing head gas—to power the oil pump or other things. Barbour depo tr, 25:9-26:16 (“the associated gas stream is commonly used by oil companies where necessary.”). Further, before the priority date, there were multiple other solutions to utilize casing head gas, including Dickerson, Belady, and MAGS. You depo tr, 244:4-250:24 (“the Mags system does describe some methods to process the

gas”). In fact, Belady discloses using casing head gas to power a data center, and the ‘372 discloses nothing more than a specific use of Belady’s data center—mining cryptocurrency. EX1011, Abstract; You depo tr, 39:4-9 (admitting a data center can be used for cryptomining); EX1030, 1. Further, industrial bitcoin mining only gained popularity in the 2010s, after Satoshi Nakamoto mined the first bitcoin block in 2009—it is only natural that it took some time for people to connect bitcoin miners to a gas generator.

24. Further, the alleged unmet need of utilizing byproduct gas from oil wells is not tied to the claims at issue because the claims broadly cover not only systems drawing power from byproduct gas from oil wells, but also systems drawing power from primary product gas from gas wells, and even gas from sales gas lines. Barbour transcript, 162:14-24 (“any oil and gas application”); You transcript, 103:11-104:6 (“I think it covers both”); Barbour transcript, 146:10-17 (“It might.”). In fact, the claims even cover systems drawing power from the electric grid. Barbour transcript, 96:15-97:2 (“unless the electrical grid is comprised of a generator with source combustible gas, then perhaps”).

d. Industry skepticism

25. Similar to commercial success and long-felt unmet need, no nexus exists between the claimed invention and the alleged industry skepticism, because the claims of the ‘372 patent broadly cover not only systems drawing power from byproduct gas from oil wells, but also systems drawing power from primary product gas from gas wells, gas from sales gas lines, and even systems drawing power from the electric grid.

e. Industry praise

26. As evidence of industry praise, Upstream cites to a K33 report that describes Upstream as a “leading company” that “pioneered the concept in 2017.” POR, 28-30.

27. However, in my opinion, the alleged “industry praise” could be attributable to numerous reasons (other than the ‘372 patent), such as Upstream’s marketing efforts and market share—there is no nexus between the praise and the claimed invention.

VI. THE LOAD CONTROL CLAIMS (CLAIMS 10-13, 35-37 AND 40) ARE OBVIOUS

28. Upstream alleges that the ‘372 patent is nonobvious because it solves the byproduct gas problem by “modulating the mining power load.” POR, 4. However, this load control feature is found nowhere in the independent claims, and is admittedly not required in most practical implementations. POR, 22 (“101 systems (~30%) were deployed with an optional controller”); Barbour transcript, 216:17-217:5 (“they were just taking a small chunk”). Moreover, this feature is rendered obvious by Belady, which discloses adjusting the load based on available gas supply. Petition, 54-55; EX1011, Abstract (“If the gas storage has insufficient gas, and a negative pressure spike occurs, the data center throttles down or offloads processing.”).

29. Regarding the load control claims (claims 10-13, 35-37 and 40), Upstream argues no motivation existed to modify CryptoKube to achieve load control, because, among other reasons, (1) the modification would involve significant changes, (2) a POSITA would have been motivated to shut off all mining servers considering the servers may be damaged by voltage and frequency drop in the power supply¹, and cooling may fail when there is no power, and (3) CryptoKube differed from Belady’s datacenter in that CryptoKube cannot offload processing to other data centers; (4) CryptoKube’s DCIM cannot control individual ASIC chips within Spondoolies; and (5) no POSITA was knowledgeable in both disciplines (oil and gas and crypto mining). POR, 51-55.

¹ There is no evidence of any “voltage and frequency drop” in either Dickerson or Belady.

30. Upstream is wrong. First, as explained by Mr. Kasdorf, a POSITA would have been motivated to modify CryptoKube with a reasonable expectation of success because CryptoKube was highly customizable, and included PLC/DCIM software that could be programmed (1) to selectively shut off a subset of the Spondoolies based on temperature and/or power supply (cite to Kasdorf dec) and (2) to ensure the cooling system is prioritized over the Spondoolies. EX1036, ¶35.

31. Second, the load control claims broadly cover both (1) shutting off a subset of Spondoolies and (2) shutting off all Spondoolies. Barbour transcript, 211:5-14 (“The mining activity can be adjusted, I guess, a number of ways. Obviously, well, cutting power to it is one”); You transcript, 225:15-23 (turning on and off meets the limitation), 228:16-25; EX1036, ¶36.

32. Third, comparing to a traditional data center (e.g., a 911 call center), one advantage of bitcoin mining is you can pause and resume at will—there is no need to actively offload the processing from CryptoKube because the processing is automatically offloaded to other miners in the blockchain network. EX1036, ¶37.

33. Fourth, the “increasing or decreasing” limitation in claim 10 requires nothing more than switching on or off the Spondoolies (e.g., all or a subset of Spondoolies). Barbour transcript, 211:5-14; You transcript, 225:15-23 (turning on and off meets the limitation), 228:16-25; EX1036, ¶38.

34. Finally, CryptoKube is highly customizable, and an oil and gas POSITA could have easily worked with the CryptoKube supplier to modify the DCIM software. EX1036, ¶39.

VII. OTHER GROUND-SPECIFIC ARGUMENTS

f. Ground 1 (Dickerson+CryptoKube)

35. Regarding the Dickerson+CryptoKube combination, Upstream argues no motivation to combine existed because Dickerson does not provide “free excess electricity”

considering its equipment cost. POR, 31. However, in the proposed combination, Dickerson's system is already implemented to power the oil production facility, and there is no additional equipment cost needed. Petition, 19-20. Dickerson teaches that its system generates excess electricity and teaches selling the excess electricity to the grid. EX1005, [0039]. When no grid was available, a POSITA would have regarded CryptoKube as a great solution. EX1005, [0039] and [0024]. Further, Dickerson teaches "[t]he modular design approach of the containerized solution allows for future **design flexibility**" and "[t]hrough the addition of future engine and membrane units, additional gas can be processed and the **generation capacity can be increased.**" Dickerson, [0034]. Thus, to the extent that more power is needed, a POSITA would have been motivated to modify Dickerson as needed to increase the generation capacity, taking into consideration the equipment cost and the potential profit generated by CryptoKube. A POSITA would have done so with a reasonable expectation of success considering Dickerson's modular design.

g. Ground 2 (Dickerson+CryptoKube+Belady)

36. Upstream repeats the Ground 1 arguments, which have been addressed above. Regarding the load control claims, Upstream's arguments also fail for reasons discussed above.

h. Ground 3 (Dickerson+CryptoKube+Belady+Boot)

37. Upstream argues that the Petition did not identify with particularity, whether Boot's engine or Dickerson's engine is used. POR, 55-56.

38. In Ground 3, the Petition referenced Ground 2's Dickerson-CryptoKube-Belady989 combination. Petition, 67 ("A POSITA would have found it obvious to improve the Dickerson-CryptoKube-Belady-989 combination by further including Boot's teachings including using Boot's load bank to absorb excess power"). Thus, Ground 3's combination uses Dickerson's engine, adding Boot's load bank.

39. Upstream incorrectly alleges no motivation to combine the primary references with Boot existed because (1) while Dickerson is a “full-facility generator,” Boot is a “pump-related generator,” and (2) Dickerson uses a chiller, which eliminates the need for a loadbank. POR, 56-58. First, similar to Dickerson, Boot is also a full-facility generator. EX1012, 2:35-39 (listing loads including “electric motors, computers, motor controllers, lighting, heating and other electrical equipment”), claim 2 (listing loads including “auxiliary electrical equipment”). Second, rather than soaking up any excess electricity, Dickerson uses the chiller to produce natural gas liquids (NGLs) for economic and environmental purposes. EX1005, [0022]. Upstream identified no evidence that Dickerson’s chiller can soak up all the excess electricity. A POSITA would have been motivated to include Boot’s load bank to be safe because similar to Boot, Dickerson’s power supply and demand may also fluctuate. EX1005, [0021].

i. Ground 4 (MAGS+Polivka)

40. Regarding the MAGS+Polivka combination, Upstream argues no motivation to combine existed because, unlike Dickerson, MAGS does not produce excess power even occasionally because all the energy produced by MAGS was already spoken for. POR, 59.

41. However, in my opinion, similar to Dickerson, MAGS can power the oil production facility and can transmit excess electricity to the grid. EX1014, [0023] (“to power various oil field equipment 812, or transmitted to the grid 814.”), [0134] (“for either local use or sale to the grid.”), [0148] and [0161]-[0162] (“sale to the grid”). Thus, similar to Dickerson, a POSITA would have understood there would be leftover power when there is no grid access. Petition, 19, 81-82.

42. Upstream further argues no motivation to combine existed because MAGS only produces 450kWh, which is not enough to satisfy Polivka’s requirement of 120.3 kW. POR, 60. Upstream is wrong. The 450 kWh embodiment is just one example based on one MAGS-200. EX1014, [0144]. The output of MAGS can be adjusted when the gas supply is abundant and

multiple MAGS-200 can be used. Young teaches “[f]lexible capacity scaling with multiple deployments on a single site is made possible with machine-to-machine communication and prioritization.” Young, [0298].

43. Upstream also argues no motivation to combine existed because, in Young, the engine is rated for 150kW, but only “about 100kW” is required and thus 50 kW would be left over for this engine. POR, 61. Upstream is wrong. As discussed above, this disclosure is just one example based on one MAGS-200, and multiple MAGS-200 can be used. A POSITA would have known to adjust the capacity of the system based on demand. A POSITA would have been motivated to adjust the capacity of the system based on demand with a reasonable expectation of success, considering the modular design. Young, [0298] (“Flexible capacity scaling with multiple deployments on a single site is made possible with machine-to-machine communication and prioritization.”).

j. Ground 5 (MAGS+Plivka+Belady)

44. Upstream argues that it is unclear how Belady’s gas shock absorber is combined, and there is no reasonable expectation of success because Belady-989 taught shutting off gas flow to the generator when supply gas pressure rises. POR, 65-67.

45. However, in my opinion, Belady’s “pressure regulating valve” is just a safety feature, and under normal conditions, it should never be triggered, because excess gas can be diverted into storage during positive pressure spikes. EX1011, Abstract.

k. Ground 6 (101)

In my opinion, the ’372 Patent centers around the abstract idea of using natural gas to power a blockchain mine, and the claims recite nothing more than “generic processes and machinery.” Petition, 114. As discussed above, the claims of the ’372 patent broadly cover not only systems drawing power from byproduct gas from oil wells, but also systems drawing power

from primary product gas from gas wells, and even gas from sales gas lines. Barbour transcript, 162:14-24 (“any oil and gas application”); You transcript, 103:11-104:6 (“I think it covers both”); Barbour transcript, 146:10-17 (“It might.”). In fact, the claims even cover systems drawing power from the electric grid. Barbour transcript, 96:15-97:2 (“unless the electrical grid is comprised of a generator with source combustible gas, then perhaps”).

VIII. CONCLUSION

46. After reviewing Patent Owner’s arguments and supporting evidence in the Patent Owner’s Reply, it is still my opinion that the challenged claims of the ‘372 patent are not patentable.

47. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 7/16/2024

A handwritten signature in blue ink, appearing to read "Michael Nikolaou".

Michael Nikolaou, Ph.D.