

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
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Appl. Serial No.: 16/484,728
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Title: BLOCKCHAIN MINE AT OIL OR GAS FACILITY

SECOND DECLARATION OF VERNON KASDORF

I, Vernon Kasdorf, declare as follows:

I. ASSIGNMENT

1. My experience and qualifications are set forth in my July 20, 2023 declaration (EX1004).

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 bitcoin mining industry. To the extent this declaration provides opinions on subject matter related to the gas and oil industry, I am relying on the opinions of Dr. Michael Nikolau (EX1003 and EX1035). To that end, I am relying on Dr. Nikolau's review and analysis of Dickerson, Belady, Boot, and the MAGS System – 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. "blockchain mining devices"

5. Upstream argues that "mining device 12" is made 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." POR, 4. Upstream also argues the claims require "blockchain mining devices" to include mining processors and a specialized network interface. POR, 4.

6. However, the specification and claims only require that "mining device 12" contains a mining processor. EX1001, 15:21-22, 16:32-33, claim 1. There is no requirement for

the “blockchain mining device” to contain a network interface or any other components. You depo tr, 157:12-158:14 (“it may or may not be within the network mining devices”); 177:9-178:11. Indeed, while Dr. You endorsed “having the whole box consider as a blockchain mining device” (You depo tr, 152:15-22), he later opined that that the “blockchain mining device” is a subpart of Hash Generator (e.g., minus the generator, the container box, and/or the racks holding the miners). You depo tr, 160:8-162:21 (“some elements relevant to the function of the blockchain mining devices are part of this device”), 205:13-207:16 (“not everything in the hash generator would be a blockchain mining device”).

b. “mining processor”

7. Upstream argues “mining processor” somehow requires a “blockchain mining circuitry” and requires a certain processor speed or power, because “computation effort” is important. POR, 5-6.

8. However, neither the specification nor the claim language requires the “mining processor” to include any specialized hardware in the form of a “blockchain mining circuitry.” EX1001, 17:9-15. In fact, the specification uses a “CPU” as an exemplary “mining circuitry,” confirming there is no special hardware requirement and a generic personal computer CPU would satisfy this term. You depo tr, 181:4-182:13 (“A personal computer could be adapted to meet all these specifications”). Indeed, even today, one can still mine crypto currency using a generic personal computer. EX1022, Title.

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. 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.

11. 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”).

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, “reliable” is a relative term and any power system can be modified to 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”). 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”).

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 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]. Dickerson’s backup diesel generator also ensures reliability. EX1005, [0021]. Belady further teaches improving reliability by using the gas supply shock absorber. EX1011, Abstract. 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, there is no need for the “optional controller” because the gas supply is abundant. Barbar depo tr, 216:17-217:5 (“they were just taking a small chunk”). In any case, a POSITA would have known how to set up the system to only use a “small chunk” of the gas supply to ensure reliability. *Id.*

15. Further, comparing to Belady's traditional data center (e.g., a 911 call center), cryptomining does not need as much uptime. I have extensive experience in designing such data centers and it is my opinion that, comparing to a blockchain mining data center (e.g., CryptoKube), Belady's traditional data center would require a more reliable power supply. An advantage of bitcoin mining is that you can pause and resume at will. You depo tr, 237:1-13 ("I don't believe everything will be lost.").

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

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

17. It is my opinion that a POSITA would have had a reasonable expectation of success in combining Dickerson and CryptoKube because the combination requires no more than plugging an appliance to a power source. The Dickerson system is designed to provide power to power the oil production facility, and to export excess electricity to the grid. EX1005, [0039]. 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 amount of Spondoolies or adjusting the generation capacity), a POSITA would have had a reasonable expectation of success in making such adjustments.

V. THE LIMITATION "CONNECTED TO THE NETWORK INTERFACE AND ADAPTED TO...COMMUNICATE WITH THE BLOCKCHAIN DATABASE" IS OBVIOUS

18. Upstream alleges that the combination of Dickerson and CryptoKube does not disclose the "connected to... communicate" limitation of claim 1, because the Petition does not

identify a “mining processor” and the ASIC chip in the Spondoolies SP35 servers (“Spondoolies”) only handles the hashing function. POR, 41-50 (“mining was the only activity performed by ASIC chips”). Similarly, Upstream alleges that the combination of MAGS and Polivka does not disclose this limitation. POR, 62-65.

19. However, the Petition states: “CryptoKube is built inside an ISO shipping container and is filled with spondooliestech, that is, blockchain mining devices, **each necessarily having a mining processor**” Petition, 23. Thus, the Petition identified the “mining processor” as a subpart of the Spondoolies and I have explained that this subpart can be an ASIC chip. EX2022, 59:9-60:16. While Upstream alleges the only function of the ASIC chip is “hashing” (solving math problems), in order to mine, the ASIC chip necessarily exchanges data (i.e., communicate) with the blockchain database. Barbour depo tr, 204:5-12 and 207:22-208:5 (“an ASIC chip needs to be controlled and have access to up-to-date information on the network.”); You depo tr, 34:6-9 (“network connectivity is important and necessary”), 197:1-10 (“blockchain mining would require connections and communications with the blockchain database”), 199:23-200:1 (“exchanging with the blockchain database will be necessary”). Indeed, the term “communicate” requires nothing more than information exchange. You depo tr, 87:1-4. Thus, this limitation is necessarily met by the ASIC chip in the Spondoolies.

20. Further, the claim language does not require a “direct” connection/communication, and allows for “indirect” connection/communication through other components (e.g., a controller). For example, the specification discloses methods of indirectly connecting the mining processor to the network interface through a modem and/or a network switch. EX1001, 15:36-40 and 16:61-67 (connecting a mining processor to the antenna via a modem and/or a network switch). Just like other processors (e.g., CPU, GPU, FPGA), the ASIC chip in the Spondoolies is connected to the

network interface via other components (e.g., a controller, a cache, a bus, and RAM), and the claim language does not require the “mining processor” itself to perform the communication functions.

21. Even under Upstream’s narrow view that claim 1 requires the “mining processor” to perform the communication functions, a combination of an ASIC chip and a controller would meet the “mining processor” limitation. Dr. You admitted that the “blockchain mining device” can be a subpart of Hash Generator (e.g., minus the generator, the container box, and/or the racks holding the miners) and the “mining processor” can be a subpart of the S9 miner (e.g., minus the front fan and/or the container box). You depo tr, 160:8-162:21 (“some elements relevant to the function of the blockchain mining devices are part of this device”), 205:13-207:16 (“not everything in the hash generator would be a blockchain mining device”), 211:23-213:19 (“this subset, if they meet all the claim language, would be considered as a mining processor”). By the same rationale, a subpart of the Spondoolies (e.g., the combination of the ASIC chip and the controller) can also be the “mining processor” that meets the “connected to... communicate” limitation.

VI. UPSTREAM FAILS TO ESTABLISH THE REQUIRED NEXUS

a. No presumption of nexus

22. It is my opinion that 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 the cooling path feature of Upstream’s products. EX1024 claim 1; Barbour depo tr, 132:11-133:6 (“maybe one to three dozen”). Another patent US11907029 covers the heat recirc function of Upstream’s products. EX1025, claim 1; (Barbour depo tr, 233:16-234:8). As shown below in Upstream’s marketing material, eight features (including heat recirc) were marketed as “why our loadcenters outperform the competition”:



EX1026, 2. 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

23. 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.”

24. Contrary to what Upstream alleges, Upstream’s products do not embody claims 1 and 24 for various reasons. First, a significant amount of Upstream’s products are single device deployments (i.e., a system containing only a single Hash Generator or Hash hut) that do not meet claim 1 according to Upstream. You depo tr, 153:10-154:7 (“this photo does not meet the limitation”); POR, 22 (“approximately 219 (~66%) were deployed in multi-system

configurations”); Barbour depo tr, 168:20-169:3. Second, an unknown amount of Upstream’s products are deployed to utilize power from either the electric grid or commercial sales gas lines, and do not meet claim 1 according to Upstream. You depo tr, 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 depo tr., 96:15-98:2 (“probably does not embody claim 1”), 149:22-150:9 (“under a hundred Hash huts sold where the customer applied it to a utility connect”); 151:5-10 (“at least some customers”). 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. POR, 22; Barbour depo tr, 156:9-161:20, 168:20-169:3. And it is not clear how many of these 284 units were deployments drawing power from natural gas wells, commercial sales gas lines, or the electric grid. Barbour depo tr, 156:9-161:20 (“Any application that was pretty clear was an oil and gas application, I generally included.”).

25. Moreover, Upstream’s website list eight features as “why our loadcenters outperform the competition.” EX1026, 2 and EX1027, 2. At least the “passive heat recirc for cold climates” feature was patented in Upstream’s patent US11907029. Barbour depo tr, 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. In fact, an unknown amount of Upstream’s products were deployed without a gas generator. Barbour depo tr, 149:22-150:9 (“I would guess that we are under a hundred Hash huts sold where the customer applied it to a utility connect.”).

26. Further, the commercial success could 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, 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 depo tr, 57:14-58:6. Also, while Upstream alleges the alleged “commercial success” was not driven by bitcoin price, its allegedly sales increased long 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); (cite bitcoin price chart).

c. Long-felt unmet need

27. Upstream alleges that there was a long-felt unmet need in the industry regarding how to utilize casing head gas, and this need supports a finding of non-obviousness. POR, 22-25. However, Upstream failed to show nexus—that the claimed invention of the ‘372 patent solves the need to utilize casing head gas.

28. In my opinion, there was no unmet need in utilizing casing head gas. 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.

29. Further, the identified need is not tied to the claims at issue because the claims broadly cover systems that use natural 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”); Barbour depo tr, 146:10-17 (“It might.”). In fact, the claims may even cover systems drawing power from the electric grid. Barbour depo tr, 96:15-97:2 (“unless the electrical grid is comprised of a generator with source combustible gas, then perhaps”).

d. Industry skepticism

30. Similar to commercial success and unmet need, there is no nexus between the claimed invention and the identified industry skepticism, because the claims broadly cover systems that use natural gas produced as a primary product, and even gas from commercial sales gas lines or the electric grid.

e. Industry praise

31. 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.

32. 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.

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

33. Upstream alleges that the ‘372 patent discloses solving the casing head gas problem by “modulating the mining power load.” POR, 4. However, this load control feature is found nowhere in the independent claims, and is not required in most practical implementations. Barbar

depo tr, 216:17-217:5 (“they were just taking a small chunk”). Moreover, this feature is obvious over 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.”).

34. 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.

35. Upstream is wrong. First, in my opinion, a POSITA would have been motivated to modify CryptoKube with a reasonable expectation of success because CryptoKube was highly customizable, and optional DCIM software that could be programmed (1) to selectively shut off a subset of the Spondoolies based on temperature or power supply and (2) to ensure the cooling system is prioritized over the Spondoolies. Specifically, the DCIM software can be programmed to monitor the temperature of the data center in several different spots. As the temperature rises, the DCIM software communicates with the PLC that controls the VFD (speed control for the fans). The rising temperature would trigger the fans to increase their speed and remove more hot air. In extreme temperature situations, where the fans were at their top speed and the temperature

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

was becoming critical, the DCIM software would start to shut down individual power outlets on the PDUs until the temperature comes back into acceptable range. The same can be said for gas supply monitoring. As the gas supply drops, the DCIM software would start to power down individual PDU outlets until the power draw is below the power supply and is operating in a manner safe for the miner Power Supply Units (PSUs). The fans would only be powered down when there is an electrical failure, or the amount of power available is less than the amount needed to run the fans. The fans would be the last devices to be powered down in the power reduction sequence.

36. 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.

37. 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.

38. 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.

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

VIII. SPECIFIC GROUNDS

a. Ground 1 (Dickerson+CryptoKube)

40. In the POR, Upstream presents arguments regarding (1) hindsight, (2) secondary considerations, (3) motivation to combine, (4) reasonable expectation of success, (5) the “connected to... communicate” limitation. Most of these arguments have been addressed above. Infra Sections III-VI.

41. Regarding Dickerson, Upstream also argues that Dickerson does not provide “free excess electricity” considering the equipment cost. POR, 31.

42. However, in the proposed combination, Dickerson’s system is already implemented to power the oil well, and there is no additional equipment cost needed. Dickerson teaches that its system generates excess electricity and teaches selling excess electricity to the grid. EX1005, [0039]. When no grid is available, a POSITA would have viewed CryptoKube as a great solution. EX1005, [0039] and [0024]. Further, Dickerson teaches “The 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.

b. Ground 2 (Dickerson+CryptoKube+Belady)

43. Upstream repeats the Ground 1 arguments, which have been addressed above. Infra Sections III-VI. Regarding the load control claims, Upstream’s arguments also fail for reasons discussed above. Infra Section VII.

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

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

45. 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.

46. Upstream alleges that while Dickerson is a "full-facility generator," Boot is a "pump-related generator," and Dickerson uses a chiller, which eliminates the need for a loadbank. POR, 57-58.

47. However, in my opinion, there is no evidence that Dickerson's chiller can soak up all the excess electricity. In fact, instead of soaking up excess electricity, Dickerson teaches the chiller is included to produce NGL for economic and environmental purposes. EX1005, [0022]. Similar to Boot, Dickerson's power supply and demand may fluctuate and a POSITA would have been motivated to include Boot's load bank to be safe.

d. Ground 4 (MAGS+Polivka)

48. Upstream largely repeats the Ground 1 arguments, which have been addressed above. Infra Sections III-VI. The same motivation to combine applies equally to MAGS and Polivka. Further, Upstream argues that, unlike Dickerson, MAGS does not produce excess power even occasionally, because MAGS separated input gases into three streams and all the energy produced by MAGS was already spoken for. POR, 59.

49. 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.

50. Upstream further argues that MAGS only produces 450kWh, which is not enough to satisfy Polivka’s requirement of 120.3 kW. POR, 60.

51. However, in my opinion, 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 ample and multiple MAGS-200 can be used. Young teaches “**Flexible capacity scaling with multiple deployments on a single site** is made possible with machine-to-machine communication and prioritization.” Young, [0298]. Further, CryptoKube is customizable, and a POSITA can install as many Spondoolies as desirable. Vern depo Tr., 28:21-24. The same goes for Polivka. A POSITA would have been motivated to customize the system based on gas supply with a reasonable expectation of success.

52. Upstream also argues 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.

53. However, 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 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.”).

54. Upstream also alleges that my previous declaration is contradictory because it identified the Spondoolies as both a mining device and mining processor. POR, 63-65.

55. There is nothing contradictory. The '372 patent uses the term “mining processor” broadly. EX1011, 3:16-17 (“The mining processor comprises a plurality of mining processors”). My previous declaration only listed the Spondoolies as an example of a “mining processor.” Other examples of “mining processor” include an ASIC chip within a Spondoolies, a combination of an ASIC chip and a controller, or other subparts of a Spondoolies.

e. Ground 5 (MAGS+Plivka+Belady)

56. 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.

57. 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.

58. Upstream repeats the Ground 1 arguments, which have been addressed above. *Infra* Sections III-VI. For the load control claims, Upstream argues there was no motivation to modify Polivka to achieve load control, because mining servers could be damaged by voltage and frequency drop in the power supply, and cooling may fail when there is no power. This argument has also been addressed above. *Infra*, Section VII. As discussed above, shutting off Spondoolies based on gas supply still meets the load control claims.

f. Ground 6 (101)

i. The challenged claims are extremely broad

59. Upstream argues (1) the gas flow from hydrocarbon facility is continuous and cannot be turned off without consequences (“not a residential gas line”); (2) the crypto mining is energy intensive. POR, 70-73.

60. However, in my opinion, the challenged claims are extremely broad and cover gas produced as the 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”). It even covers gas from commercial sales lines or power from the electric grid. Barbour depo tr, 146:10-17 (“It might.”), 96:15-97:2 (“unless the electrical grid is comprised of a generator with source combustible gas, then perhaps”). Indeed, claim 1 has no distance requirement between the mining device and the gas source. You depo tr, 110:9-17 (“I don’t see a distance limitation in claim 1”); EX1001, claim 8 (“located adjacent to the facility”). Thus, claim 1 broadly covers the abstract idea of using gas generators to power blockchain mining, and preempts the field.

61. Upstream argues there is an “inventive step” because the integration of a generator and the special-purpose mining processors is innovative. POR, 73.

62. However, in my opinion, claim 1 does not require any “special-purpose mining processors.” As Dr. You admitted, a CPU in a generic personal computer could satisfy claim 1. You depo tr, 181:4-182:13 (“A personal computer could be adapted to meet all these specifications”).

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

63. Upstream argues that there is a special hardware requirement “including that the mining processors include blockchain mining circuitry configured with mining algorithms, such as a cryptographic hashing algorithm.” POR, 73-74.

64. However, as discussed above, claim 1 does not require any “special-purpose mining processors.” You depo tr, 181:4-182:13.

65. Upstream argues that 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. POR, 75.

66. However, it is my opinion that the challenged claims cover methods of organizing human activity—combining a first human activity of gas power generation with a second human activity of cryptomining.

67. Upstream also emphasized that the claims require “multiple (not only one) ‘blockchain mining devices’.” POR, 75-76.

68. It is not clear why having multiple mining devices is an inventive concept, especially considering Upstream’s position that claim 1 does not require multiple mining devices connected to the same generator. You depo tr, 79:20-80:5 (“there’s no requirement, in my opinion, that these devices should be connected to the same generator.”). Indeed, prior art blockchain mining data centers (e.g., CryptoKube, Polivka) typically include multiple mining devices (e.g., Spondoolies). EX1006, 1.

iii. Step 2A, Prong Two: The ’372 Patent Claims Recite A Practical Application

69. Upstream argues “(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.” POR, 76-77.

70. However, as discussed above, claim 1 broadly covers gas produced as a primary product and even gas from sales gas lines. Second, prior art blockchain mining data centers (e.g.,

CryptoKube, Polivka) typically include multiple mining devices (e.g., Spondoolies), and the mere presence of multiple devices is not innovative. Third, claim 1 merely combines a generic gas generator with a generic cryptomining device, and covers systems located hundreds of miles away from the gas source.

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

71. Upstream argues there is a requirement for the system to be located proximate to the hydrocarbon facility because the claim requires that the “generator [is] connected to the source of combustible gas” that is “produced from a ... hydrocarbon production, storage, or processing facility.” POR, 77-79.

72. However, in my opinion, claim 1 has no distance requirement between the mining device and the gas source. You depo tr, 110:9-17 (“I don’t see a distance limitation in claim 1”). Indeed, Upstream had to turn to dependent claim 8 for the limitation “located adjacent to the facility.” POR, 78.

73. Upstream argues Petitioner’s claim constructions of “blockchain mining devices” and “blockchain mining processor” read the special mining circuitry hardware requirements out of the claim. POR, 80-81.

74. However, while the specification mentions ASICs and FPGAs, nothing in the claims require any special “mining circuitry”—claim 1 broadly covers the CPU in a generic personal computer. You depo tr, 181:4-182:13 (“A personal computer could be adapted to meet all these specifications”). Even for load control, the specification only talks about “changing the core voltage or the clock rate of the processor,” which can easily be performed with a generic personal computer by overclocking.

75. Upstream argues that Szmigielski teaches crypto mining needs “reliable” power. POR, 81-82.

76. It is not clear how this is related to an inventive concept. In any case, as discussed above, prior art gas generators provide “reliable” power. *Infra*, Section III.B.

77. Upstream cites Crusoe’s ‘307 patent’s background section for the statement that “there remains a need for systems and methods for generating electricity from natural gas produced from oil wells.” POR, 82-83.

78. The cited statement just shows there was a need for such systems, and does not suggest the combination is not obvious—The fact that there is a need for cheap electricity in cryptomining does not mean that is not obvious.

v. **Upstream alleges the Petition did not address the patent eligibility of the dependent claims**

79. In my opinion, none of the alleged features in these dependent claim limitations amounts to an inventive concept that is “significantly more” than the recited judicial exception. Petition, 117-119.

80. Claims 2 and 28 require isolation from sales gas lines and the grid, and claims 3 and 29 require “remote oil or gas well.” As shown in various references (Dickerson, Belady, Boot, etc.), this is nothing new. EX1005, [0024] (“production facilities are typically located in **remote areas** where no utility power is available.”); EX1011, [0002]; EX1012, 1:5-10.

81. Claims 4 and 30 require a “combustion engine.” As shown in various references, this is nothing new. EX1005, [0026]; EX1012, [2:29-35].

82. Claim 8 requires “the generator and blockchain mining devices are located adjacent to the facility.” As shown in various references, this is nothing new. EX1011, Abstract (“co-located data center”).

83. Claim 16 requires “controller ... to operate a cooling system to maintain the blockchain mining devices within a predetermined operating range of temperature.” This is nothing new. EX1006, 1, 4; EX1007, 0:05:41; EX1023, 0:02:00; EX1015, 8, 31.

84. Claim 17, 20, and 21 recite requirements of a “portable enclosure” that may be “intermodal transport container” that includes “access doors. This is nothing new. EX1005, [0014], [0027], claim 3; EX1006, 1-4; EX1007, 0:01:08; EX1014, [0162], FIG. 4; EX1015, 1-10; EX1019, 0:00:08.

85. Claims 22, 23, 25, 26 and 27 recite “a combustible gas disposal device.” This is nothing new. EX1005, [0028]; EX1011, FIG. 1, [0028]; EX1014, [0274], FIG. 9; EX1014, [0142].

86. 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.” This is nothing new. EX1010, [0030]; EX1014, FIG. 18.

87. Finally, as discussed above, the load control claims are obvious. Infra Section VII.

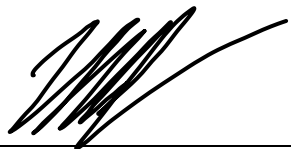
88. Ultimately, the patent claims of the '372 patent recite conventional equipment that operate in a conventional manner.

IX. CONCLUSION

89. 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.

90. 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



Vernon Kasdorf