

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Stephen Barbour
U.S. Patent No.: 11/574,372 Attorney Docket No.: 54598-0001PS2
Issue Date: February 7, 2023
Appl. Serial No.: 16/484,728
Filing Date: January 6, 2020
Title: BLOCKCHAIN MINE AT OIL OR GAS FACILITY

SECOND DECLARATION OF VERNON KASDORF

I, Vernon Kasdorf, declare as follows:

I. ASSIGNMENT

1. I have been retained on behalf of Crusoe Energy Systems, LLC. (“Crusoe” or “Petitioner”) to offer technical opinions related to U.S. Patent No. 11/574,372 (“The ’372 patent”), assigned to Upstream Data Inc. (“Upstream” or “Patent Owner”). I understand that Crusoe is requesting the Patent Trial and Appeal Board (“PTAB” or “Board”) to institute a post-grant review (“PGR”) proceeding of the ’372 patent.

2. I have been asked to provide my independent analysis of the ’372 patent. Crusoe has specifically asked for my analysis from the perspective of a POSITA in the bitcoin mining industry.

3. I am not and never have been, an employee of Crusoe. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent analyzing the ’372 patent and issues related thereto, and I will not receive any added compensation based on the outcome of this PGR or other proceeding involving the ’372 patent.

II. QUALIFICATIONS

4. My name is Vernon Kasdorf. I am the CEO of KubeData Systems Inc. and have held that position since 2013.

5. I have a Bachelor’s Degree in business administration from Trinity Western University.

6. I have extensive experience in building industrial cryptocurrency mining data centers, including data centers for mining Bitcoin. I have over 25 years of experience in the IT sector, with my career heavily focused on mining within the oil, gas, mineral, and cryptocurrency industries.

7. KubeData Systems Inc., my company, primarily, provides senior, strategic IT

consulting services to mining companies, IoT companies, and large Enterprise organizations. I was also the owner and partner in KubeData Systems Inc. from 2013 to present.

8. My company developed and commercialized the CryptoKube mobile bitcoin miner system, to address the demand for an industrial cryptocurrency mining mobile data center. It was also our first 100% free-cooled data center. KubeData Systems Inc. designed and built three generations of CryptoKube mining data centers, servicing the Canadian and United States market.

9. I have provided IT Strategic Consulting to many companies, including Goldcorp (the world's largest gold miner).

10. I am fully familiar with the CryptoKube brochure dated March 5, 2016 ("CryptoKube brochure") and CryptoKube Bitcoin mining Data center tour(CC) ("CryptoKube video"). The CryptoKube brochure is EX1006, and the CryptoKube video is EX1007. I am able to authenticate both and declare that both the CryptoKube brochure and the CryptoKube video were published before February 8, 2017 – which I understand to be the earliest claimed priority date of the '372 patent.

11. I have personal knowledge that the CryptoKube brochure was originally published (distributed online, at trade show, and via emails to customers) in 2014 and the CryptoKube video was published on YouTube on December 18, 2014.

12. My curriculum vitae, which includes a complete list of my publications, is included as Appendix A.

13. I am being compensated at a rate of \$350 per hour for my work in this case. This compensation is not contingent on the nature of my findings or the outcome of this litigation.

14. I am over the age of 18 and am competent to write this declaration. I have personal knowledge, or have developed knowledge, of the technologies discussed in this declaration based upon my education, training, or experience with the matters discussed herein.

III. PERSON OF ORDINARY SKILL IN THE ART

15. In my opinion, a person of ordinary skill in the art of the '372 patent would have a degree in chemical engineering, petroleum engineering, process engineering, mechanical engineering, or a similar field with 1-2 years of experience in designing power generation systems, Bitcoin mining systems, or other comparable hands-on experience. Alternatively, a person having 3-5 years of experience in the Bitcoin mining industry would also qualify as a POSITA. Additional education could substitute for professional experience, or vice versa.

IV. LEGAL PRINCIPLES

16. I am not a lawyer and I will not provide any legal opinions in this PGR. Although I am not a lawyer, I have been advised that certain legal standards are to be applied by technical experts in forming opinions regarding the meaning and validity of patent claims.

A. Claim Construction

17. I understand that claim terms are generally given their plain and ordinary meaning in light of the patent's specification and file history as understood by a person of ordinary skill in the art at the time of the purported invention. In that regard, I understand that the best indicator of claim meaning is its usage in the context of the patent specification as understood by a POSITA. I further understand that the words of the claims should be given their plain meaning unless that meaning is inconsistent with the patent specification or the patent's history of examination before the Patent Office. I also understand that the words of the claims should be interpreted as they would have been interpreted by a POSITA at the time of the invention was made (not today).

B. Indefiniteness

18. I understand that a claim is indefinite under § 112 if a POSITA, viewing the claim in light of the specification and prosecution history, cannot determine the full scope of the invention with reasonable certainty. I understand that, if a claim term is amenable to two or more plausible constructions, any claim containing that term is indefinite.
19. I understand that a claim that depends from an indefinite claim is itself indefinite unless additional limitations resolve any indefiniteness.

C. Written Description

20. I understand that the four corners of a patent application must reasonably convey to a POSITA that the inventor had possession of and actually invented the claimed subject matter at the time the application was filed.

D. Indefiniteness for Means-Plus-Function Terms

21. I understand that a claim term that does not use the word “means” is presumed not to be a means-plus-function term subject to §112(f). I understand that the presumption is overcome if it is shown that a claim term (1) recites function without sufficient structure, as understood by a POSITA, for performing the function, or (2) does not recite sufficiently definite structure. I understand that reciting “sufficiently definite structure” means whether the words of the claim, as understood by a POSITA, have definite meaning as the name of for the structure.
22. I understand that in the case of a claim term that is associated with performing multiple functions, the claim term must have sufficient definite structure capable of performing all of the recited functions. I understand that in assessing the meaning of the term, it is done in view of the functions it is claimed to perform in light of the specification and claims.
23. I understand that a claim term that is a means-plus-function term subject to § 112(f) is indefinite if the specification fails to disclose sufficient structure to perform all of the

claimed functions. I understand, in the case of computer implemented means-plus-function terms, an algorithm must be disclosed to provide sufficient structure. I understand that an algorithm can be recited in any understandable terms to a POSITA including in prose.

V. MATERIALS CONSIDERED

24. In forming my opinion, I considered the following documents:

EX1001	U.S. Patent No. 11,574,372 to Stephen Barbour et al. (“the ’372 Patent”)
EX1002	Excerpts from the Prosecution History of the ’372 Patent (“the Prosecution History”)
EX1006	CryptoKube brochure from the WaybackMachine dated March 5, 2016 (“CryptoKube brochure”)
EX1009	Szmigielski, Albert. Bitcoin Essentials. Packt Publishing Ltd, 2016 (“Szmigielski”)
EX1010	U.S. Patent Publication No. 2016/0125040 (“Kheterpal”)
EX1014	US Patent Publication No. 2015/0368566 (“Young”)
EX1017	U.S. Patent Publication No. 2014/0096837 (“Belady-837”)
EX1018	U.S. Patent Publication No. 2018/0109541 (“Gleifchauf”)
EX1022	“Crypto you can mine from a home computer in 2023,” Brave New Coin (bravenewcoin.com) (July 18, 2023)
EX1025	O’Dwyer, Karl J., and David Malone. ISSC 2014, "Bitcoin mining and its energy footprint." (2014): 280-285 ("O’Dwyer”)
EX1026	Kaplan, Steven. (2004). Electrical and Electronics Engineering Dictionary.
EX1027	The IEEE Standard Dictionary of Electrical and Electronics Terms (6th ed) (1996). IEEE.
EX1100	Complaint for Patent Infringement, <i>Upstream Data Inc. v. Crusoe Energy Systems LLC</i> , Case No. 1:23-cv-01252 (D. Colo. May 18, 2023)

25. In addition to the documents and materials cited in this declaration, I also relied on my knowledge, education, skills, experience, and training in forming my opinions.

VI. BACKGROUND – BITCOIN/BLOCKCHAIN MINING

26. The following paragraphs regarding Bitcoin mining are based on prior art to the ’372 patent. As stated above, for the purposes of this declaration, I have been asked to assume that the earliest priority date of the ’372 patent is February 8, 2017.

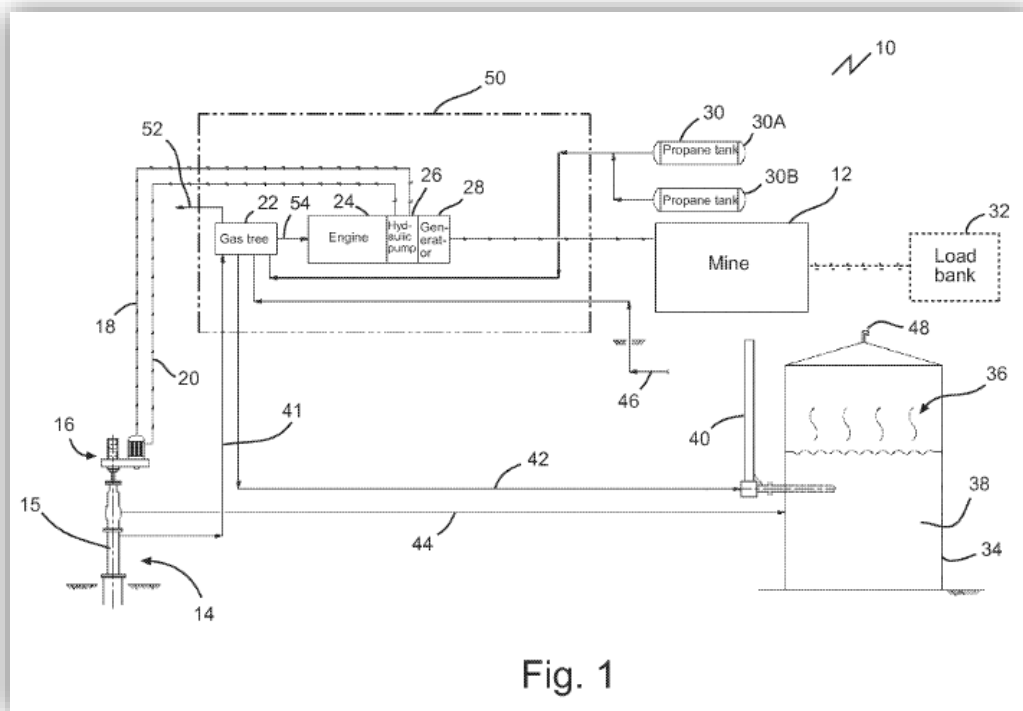
27. The Bitcoin protocol defines a system in which the creation and distribution of the

bitcoin cryptocurrency is governed by consensus among a peer-to-peer network. EX1010, [0004]. The network maintains a public ledger (e.g., bitcoin database) in which new transactions are verified and recorded by members of the network via cryptography. *Id.* The operations of verifying and recording transactions of cryptocurrencies such as transactions in the bitcoin cryptocurrency are sometimes referred to as mining, because completion of each mining operation typically rewards the miner with newly created cryptocurrency (e.g., bitcoins). *Id.* Verified transactions and newly created bitcoins are recorded in the public ledger. *Id.* The public ledger serves as an official history of transactions. *Id.* The amount of cryptocurrency owned by any entity may be determined from the public ledger. *Id.*

VII. OVERVIEW OF THE '372 PATENT

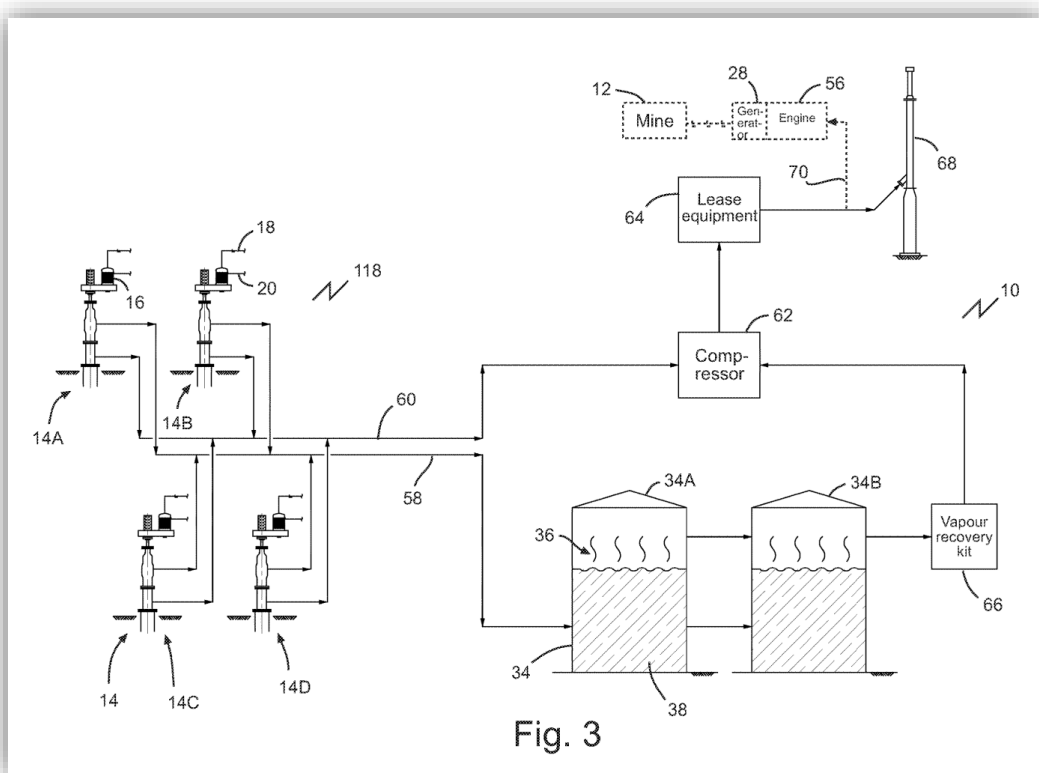
28. The '372 patent relates to “operating a blockchain mining device using natural gas produced at a hydrocarbon production, storage, or processing site/facility.” EX1001, Abstract. By way of background to its technology, the '372 Patent explains that “[a]t remote oil and gas facilities, excess natural gas is often wasted, for example vented to atmosphere or burned via flaring.” EX1001, 1:11-13. Figures 1 and 2 are schematics illustrating systems for “powering a blockchain [mining device (12)] at a remote oil well [14],” with a generator (28). EX1001, 5:53-62; 8:35-48.

29. Figure 1 (shown below) shows “a generator [28] retrofitted to a prime mover [24], which operates a drivehead to pump oil up from the reservoir.” EX1001, 5:53-56. That is, in this case, the blockchain mining device (12) is connected to a generator (28), which is retrofitted to a prime mover.



'372 Patent, EX1001, Fig. 1

30. Figure 2 (shown below) is similar to Figure 1, but this embodiment includes two engines—one that (with a generator) powers the blockchain mining device (12), and one that operates the drive head. *See* EX1001, 5:57-62.



'372 Patent, EX1001, Fig. 3

32. Common among these three embodiments is that, in each case, a blockchain mining device is connected to a generator that runs on combustible gas – in particular, natural gas at an oil well or oil storage unit.

33. I understand that the '372 patent lists Stephen Barbour as the inventor, Upstream Data Inc. ("Upstream") as the applicant and assignee, and has the title: "Blockchain Mine at Oil or Gas Facility." For purposes of this declaration, I have been asked to assume that February 8, 2017, the filing date of US provisional application No. 62/456,380, is the earliest possible priority date for the '372 patent.

34. Generally, the '372 patent discusses systems and methods for using a source of combustible gas to power bitcoin mining. I understand that in the related Complaint, Upstream

has relied specifically on claims 1 and 2 of the '372 patent.

VIII. OVERVIEW OF THE PROSECUTION HISTORY

35. The application that led to the '372 patent was filed as U.S. Patent Application No. 16/484,728 on February 6, 2018. EX1002.

36. I understand that the '372 patent was filed with 41 claim, two of which were independent claims.

1. A system comprising:
a source of combustible gas produced from an oil production, storage, or processing facility;
a generator connected to the source of combustible gas; and
a blockchain mining device connected to the generator.

24. A method comprising using a source of combustible gas produced at a hydrocarbon production well, storage, or processing facility, to produce electricity to operate a blockchain mining device located at the hydrocarbon production well, storage, or processing facility, respectively.

EX1002, 686-691. I further understand that before examination, the claims were amended to “remove all multiple dependencies and reduce excess claim fees.” EX1002, 543-550. Claims 1 and 24 were not amended.

37. I understand that on August 9, 2021, before any office actions had been mailed, a third-party submission was made to cite a Reddit posting dated July 3, 2016. EX1002, 439-447. According to the third-party submitter, the Reddit posting “discloses a source of combustible gas, a generator that generate (sic) electricity from combustion of the gas, and a blockchain mining device.” EX1002, 440.

38. I understand that the Office initiated and conducted an interview with the Upstream’s representative on April 15, 2022, “to gain insight and a better understand (sic) the claimed invention as well as the oil/natural gas industry as it applies to block chain mining.”

EX1002, 348. The Office concluded that the third-party submission “reads adequately on the independent claims,” and suggested that “[m]oving forward, [] drafting independent claims that clearly unite the combustible gas production elements and the block chain mining elements.” EX1002, 348. With respect to the dependent claims, the Office indicated that “[a]llowable subject matter may reside in dependent claims 12–18,” but that “further searching [would be] required.” EX1002, 348. The Office’s initial search revealed little in the way of qualified prior art, but did reveal Belady-837 (US20140096837A1). EX1002, 348.

39. I understand that on April 19, 2022, before Upstream amended the claims, the Office mailed an Office Action. EX1002, 329-347. Claims 1 and 24, as well as dependent claims, were rejected for obviousness over Belady-837 and Gleifchauf (US20180109541A1). EX1002, 336. No anticipation rejections were made, despite the Office having indicated in the April 15 interview that the Reddit Post reads on the independent claims.

40. I understand that, in making the obviousness rejection, the Office took the position that Belady-837 discloses using a gas generator to power a data center (blockchain mining device), and Gleifchauf discloses using servers for blockchain mining and verification. EX1002, 336-337. According to the Office, it would have been obvious to combine Belady-837 and Gleifchauf because Belady-837 discloses “data centers are being located in areas where natural resources, from which electrical power can be derived, are abundant and can be obtained inexpensively. For example, natural gas is a byproduct of oil drilling operations and is often considered a waste byproduct since it cannot be economically captured and brought to the market.” EX1002, 336-337 (quoting EX1017, [0004]).

41. I understand that subsequent to receiving the obviousness rejection, Upstream amended the independent claims to recite:

1. A system comprising:
a source of combustible gas produced from ~~[[an oil]]~~a facility selected from a group consisting of a hydrocarbon production, storage, or processing facility;
a generator connected to the source of combustible gas to receive a continuous flow of combustible gas to power the generator; and
~~[[a]]~~ blockchain mining devices connected to the generator;
in which
the blockchain mining devices each have a mining processor and are connected to a network interface;
the network interface is connected to receive and transmit data through the internet to a network that stores or has access to a blockchain database;
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 network is a peer-to-peer network;
the blockchain database is a distributed database stored on plural nodes in the peer-to-peer network; and
the blockchain database stores transactional information for a digital currency.

24. A method comprising:
Producing electricity using a generator and a source of combustible gas produced at a facility selected from the group consisting of a hydrocarbon production well, storage, or processing facility, to produce electricity to and operating~~[[e a]]~~ blockchain mining devices ~~located at the hydrocarbon production well, storage, or processing facility, respectively,~~ using the electricity, in which:
the generator is connected to the source of combustible gas, in which the facility is connected to produce a continuous flow of combustible gas to the generator;
the blockchain mining devices [. . .].¹

42. I understand that, to overcome the obviousness rejection, Upstream argued that its system uses “flare gas” as opposed to “sales gas.” EX1002, 222-223. I understand that Upstream also argued that blockchain mining is different from traditional data-processing because it requires more energy. EX1002, 222-223. Upstream argued that its “discovery amounts to a new use for

¹ The remainder of the amendments to claim 24, with respect to the block chain mining devices, are identical to those made in claim 1. CRUSOE-1002 209-224.

previously known individual components (a common precursor for patentability), and may provide numerous benefits including the reduction of greenhouse gas emissions and capture of revenue where gas disposal is otherwise a capital loss (for example paragraphs 33, 34, 48, and 73), EX1002, 223.

43. I understand that on August 31, 2022, a notice of allowance was mailed. EX1002, 4-9. In the “Reasons for Allowance,” the Office indicated that:

With regard to any rejections under 35 USC § 101 based upon the Alice Corporation Pty. Ltd. v. CLS Bank guidelines, the Examiner finds that the claimed invention amounts to significantly more than a judicial exception or an abstract idea. Also, the claimed invention demonstrates a practical application. The specification clearly teaches and describes blockchain mining at hydrocarbon facility. Any rejections under 35 USC § 101 are hereby withdrawn. Additionally, the 2019 PEG defines the phrase “integration into a practical application” to require an additional element(s) or a combination of additional elements in the claim to apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that it is more than a drafting effort designed to monopolize the exception. See MPEP 2106.04(d). I

With regard to the rejections under 35 USC § 103, the Examiner has carefully reviewed the Applicants responses filed on **07/04/2022**. Based upon the Applicants arguments and assertions, the Examiner is persuaded by and agrees with the Applicant. The assertions and arguments provided by the Applicant credibly declare and make clear that the independent claims and the limitations contained therein are allowable either in part or taken as a whole over the prior art of record. None of the art of record, taken individually or combination, disclose at least the method step or system components contained within the independent claims. Consequently, The prior art of record fails to fully disclose or reasonably teach the independent claims as a whole. See MPEP 1302.14. Moreover, even though the individual references applied in the prior art may teach each individual limitation sufficiently, there does not appear to be sufficient grounds for combining or modifying the prior art of record to adequately arrive at the claimed invention. See MPEP 2143.01.

44. I understand that the '372 patent issued shortly after a Rule 312 amendment (amending claims 15, 16, 18, 31, 37, 38, 40 to recite “hydrocarbon production well, storage, or

processing facility”). EX1002, 20-29.

IX. THE CHALLENGED CLAIMS

45. I understand that for purposes of this proceeding, Petitioner is challenging the validity of claims 1-41 (“the Challenged Claims”) of the ’372 patent.

46. Claim 1 of the ’372 patent is representative of the Challenged Claims and is shown below:

1. A system comprising:

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

a generator connected to the source of combustible gas to receive a continuous flow of combustible gas to power the generator; and

blockchain mining devices connected to the generator;

in which:

the blockchain mining devices each have a mining processor and are connected to a network interface;

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

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 network is a peer-to-peer network;

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

the blockchain database stores transactional information for a digital currency.

X. ANALYSIS OF THE CLAIMS OF THE ’372 PATENT (INDEFINITENESS)

47. Based on my knowledge and experience and my reading of the ’372 patent, I believe that the Challenged Claims are indefinite.

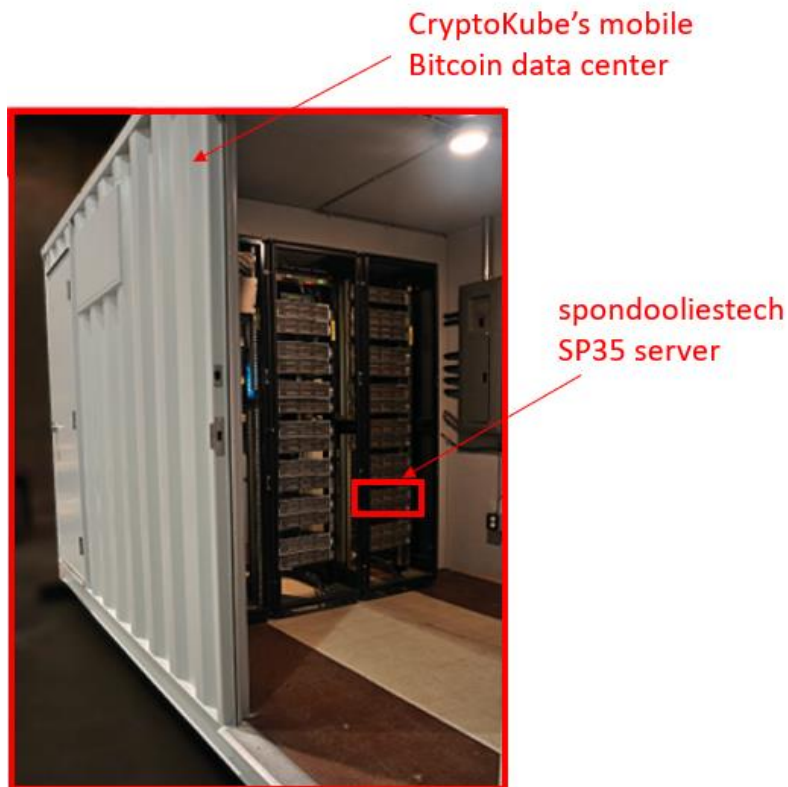
i. “blockchain mining devices”

48. As discussed below, the plural form of the term “blockchain mining devices,” appearing in the ’372 patent claims is indefinite for several reasons.

49. All independent claims of the ’372 patent recites the term “blockchain mining devices.” Independent claim 1 recites “blockchain mining devices connected to the generator.”

Independent claim 24 recites “operating blockchain mining devices located at the facility.” These claims are indefinite because multiple different interpretations of the term “blockchain mining devices” are possible. In my opinion, the term “blockchain mining devices” could refer to either (1) a plurality of mining servers (e.g., spondooliestech SP35 servers) housed together (e.g., in a portable shipping container), or (2) a plurality of mobile data centers (i.e., a plurality of shipping containers, each configured as a mobile data center such as CryptoKube’s mobile Bitcoin data center) each containing a plurality of mining servers housed together.

50. For example, as shown below in EX1006, the grey metal enclosure is a standard shipping container that has been modified to serve as a portable mobile data center housing various components and electronics, including a plurality of mining servers. Thus, a mining server is very different from a mobile data center.



[EX1006, 2 (annotated)].

51. Consistent with the first construction (a plurality of mining servers housed together), claim 17 requires that “the blockchain mining devices **are housed** in a portable enclosure that is structured to one or more of form a skid or be mounted on a trailer.”² [EX1001, claim 17]. Thus, this dependent claim supports the construction that the term “blockchain mining devices” refers to a plurality of mining servers housed together. Similarly, dependent claim 16 requires “a controller is connected to operate **a cooling system** to maintain the blockchain mining devices within a predetermined operating range of temperature.” [EX1001, claim 16]. In my opinion, a POSITA would have understood that for the plurality of blockchain mining devices to share the same cooling system, the term “blockchain mining devices” should mean the plurality of mining servers are housed together, for example, in a modular shipping container. Thus, both dependent claims 16 and 17 require the first construction (a plurality of mining servers housed together).

52. Other claims of the ‘372 patent use the term “blockchain mining devices” in a more ambiguous manner and may be interpreted to support either construction. For example, claim 1 recites “[a] system comprising: ... **blockchain mining devices** connected to the generator; in which: the **blockchain mining devices** each have a mining processor and are connected to a network interface.” Claim 8 recites “the generator and **blockchain mining devices** are located adjacent to the facility.” Claim 10 recites “the system is configured to modulate a power load level exerted by the **blockchain mining devices** on the generator, by increasing or decreasing the mining activity of the mining processor.” Claim 15 recites “a backup source, selected from a group consisting of fuel or electricity, is connected make up a shortfall in fuel or electricity, respectively, required to supply the **blockchain mining devices** with the power load level.” Claim 24 recites “[a] method comprising: ... operating **blockchain mining devices** located at the facility,

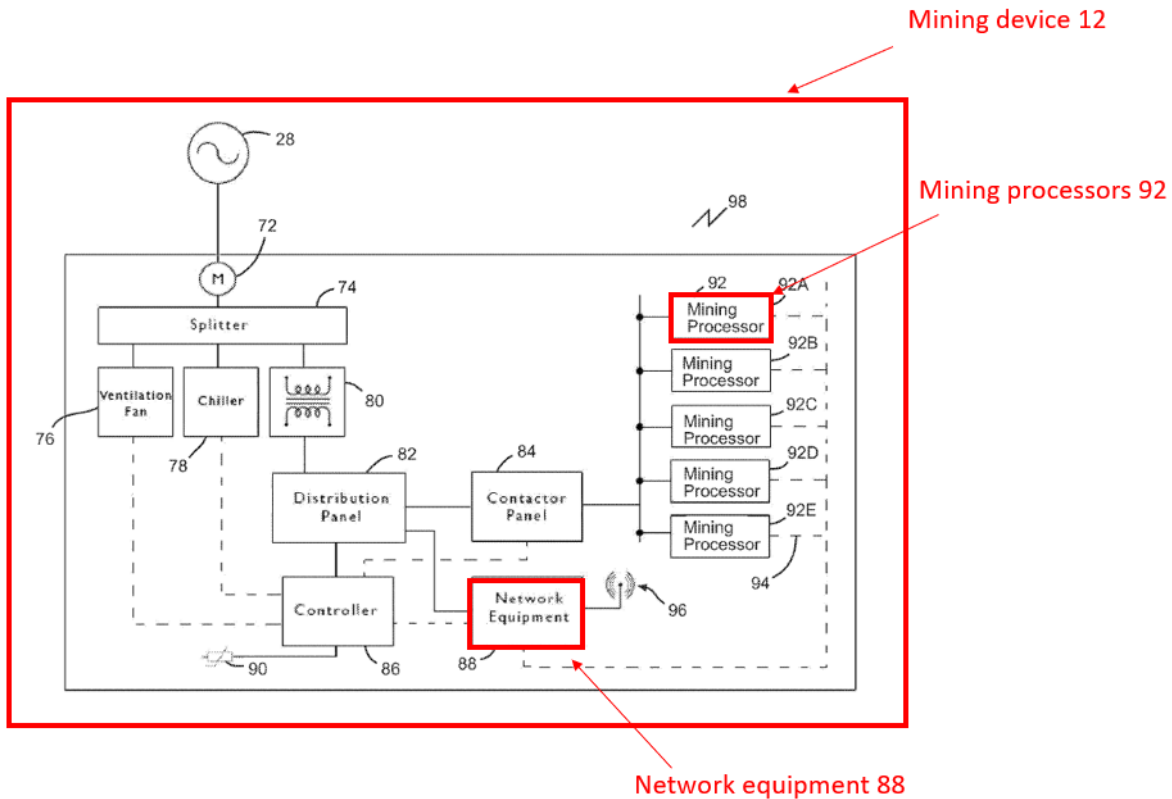
² All emphases added unless otherwise noted

respectively, using the electricity, in which: ... the **blockchain mining devices** each have a mining processor and are connected to a network interface.” Claim 25 recites “connecting the source of combustible gas to operate the **blockchain mining devices**.” Claim 27 recites “connecting the source of combustible gas to operate the **blockchain mining devices**; and diverting gas from a combustible gas disposal device to operate the **blockchain mining devices**.” Claim 34 recites “operating the **blockchain mining devices** to: mine transactions with the blockchain mining devices; and communicate wirelessly through the internet to communicate with a blockchain database.” Claim 35 recites “modulating a power load level exerted by the **blockchain mining devices** on the generator, by selecting an action from a group of actions consisting of increasing or decreasing, a mining activity of the **blockchain mining devices**.” Claim 40 recites “supplying from a backup source, which is selected from a group consisting of a backup fuel or electricity source a shortfall in fuel or electricity, respectively, required to supply the **blockchain mining devices** with the power load level.”

53. Despite the teachings of the dependent claims, both the specification and prosecution history demand the second construction (a plurality of mobile data centers, each containing a plurality of mining servers). First, consistent with the second construction, the specification teaches that “[t]he blockchain mining device **comprises an intermodal transport container**.” [EX1001, 3:51-52]. Thus, according to the specification, the plurality of “blockchain mining devices” refers to multiple mobile data centers, each containing a plurality of mining servers.

54. Further, as shown in FIG. 4 below, the specification teaches that each “blockchain mining device 12 may have a network interface, such as network equipment 88, and **one or a plurality of mining processors** 92 (92A-92E for example).” [EX1001, 15:21-25]. Further, the

specification teaches that “[e]ach mining processor 92 may be positioned on racks or shelving units,” suggesting that “mining processor 92,”³ as opposed to blockchain mining device 12, refers to the mining server (e.g., spondooliestech SP35 server). [EX1001, 17:21-22]. As annotated below, FIG. 4 illustrate a “blockchain mining device 12,” which contains a plurality of mining processors 92, and network equipment 88.



[EX1001, FIG. 4 (annotated)].

³ As discussed in Section IV.A.3 below, to make things worse, the term “mining processor” is also indefinite because it is not clear whether it refers to (1) a mining server (e.g., a spondooliestech SP35 server) containing a plurality of application-specific integrated circuits (ASICs)), or (2) a chip within the mining server (e.g., an ASIC inside of a spondooliestech SP35 server).

55. Further, consistent with the second construction (a plurality of mobile data centers), the specification teaches “[t]he blockchain mining device may be replaced by a suitable mining device or **data center**.” [EX1001, 4:55-56]. Thus, the specification teaches that the term “blockchain mining device” is interchangeable with the term “data center.” Thus, a POSITA would have understood that the claim limitation “blockchain mining devices” requires a plurality of mobile data centers, each of which contains multiple mining servers housed together. Other parts of the specification use the term in a more ambiguous manner and may support either construction. For example, the specification states “the generator 28 and **blockchain mining device** 12 may be positioned at a suitable location relative to the hydrocarbon well, storage site, or processing facility, such as remote oil well 14.” [EX1001, 9:14-17].

56. Further, during prosecution, to overcome prior art rejections, claims 1 and 24 were amended to recite a plurality of “blockchain mining devices” (plural) as opposed to “a blockchain mining device” (singular). [EX1002, 210 and 213]. In the remarks accompanying the amendment, Upstream argued that “Belady teaches a [singular] gas-powered data center.” [EX1002, 223]. Upstream explained that independent claims 1 and 24 were amended to “clarify that there are **plural** blockchain mining devices.” [EX1002, 218]. Thus, Upstream relied on the requirement of multiple “blockchain mining devices” to distinguish over prior art containing a single data center, thereby indicating that the term requires a plurality of data centers.

57. Thus, while the dependent claims support the first construction (plurality of mining servers housed together within a single data center), both the specification and the prosecution history support the second construction (multiple data centers, each housing a plurality of mining servers). Given the resulting ambiguity, a POSITA would have had no guidance on what constitutes a plurality of “blockchain mining devices.”

58. As such, it is my opinion that a POSITA would not understand what is claimed by “blockchain mining devices” in each of independent claims 1 and 24, and, through their dependence thereon, each of dependent claims 2-23 and 25-41.

ii. “mining processor”

59. It is my opinion that the claim term “mining processor” is also indefinite. Both independent claims 1 and 24 require that “the blockchain mining devices each have [sic] a mining processor.” But for essentially the same reasons that “blockchain mining devices” is indefinite, it is equally unclear whether the term “mining processor” refers to (1) a mining server (e.g., a spondooliestech SP35 server) containing a plurality of application-specific integrated circuits (ASICs)), or (2) an individual chip within the mining server (e.g., an ASIC inside of a spondooliestech SP35 server).

60. As discussed above, claim 17 requires that “the blockchain mining devices are housed in a portable enclosure that is structured to one or more of form a skid or be mounted on a trailer,” suggesting that the term “blockchain mining devices” refers to mining servers (e.g., spondooliestech SP35 servers). If the term “blockchain mining devices” refers to the mining servers, then the term “mining processor” cannot also mean mining servers. By inference, the term “mining processor” should refer to a chip inside the mining server. Thus, claim 17 suggests that the term “mining processor” refers to a chip inside the mining server. However, the specification teaches:

The components of **an ASIC mining processor** include the hash boards (each board has numerous chips that is [sic] doing the hashing), a controller (to communicate with the network and optimize the mining processors chip frequency and fans for cooling), and a power supply (typically converts AC input power to DC power for the ASIC). Each **mining processor** 92 may be positioned on racks or shelving units.

[EX1001, 17:15-22]. A POSITA would have understood the foregoing passage as meaning that the mining processor 92 was not a chip (or a circuit or a hash board) within a mining server, but

rather was a device of sufficient size and form that it could be “positioned on racks or shelving units,” which suggests that the mining processor 92 was a standalone object. Thus, the specification requires the term “mining processor” to mean a mining server.

61. Further, claim 10 requires “increasing or decreasing the mining activity of the **mining processor**.” Under the second construction of “mining processor” (an individual chip within the mining server), it is not clear how the mining activity of a chip can be adjusted—a POSITA would not know how to adjust the mining activity of a single ASIC within a mining server.

62. Further, the specification teaches that “[t]he **mining processor** comprises a plurality of **mining processors**,” without any attempt to explain the difference, if any, between a “mining processor” and the multiple “mining processors” of which it is comprised. [EX1001, 3:16-17; EX1001, 17:55-56 (“The mining processor 92 may comprise a plurality of processors....”); EX1002, 545 (original claim 13)].⁴ Without such an explanation, a POSITA would have essentially no idea what was meant by “a mining processor” or how it could comprise a plurality of itself – i.e., “a plurality of mining processors.” Consequently, these specification disclosures result in an unreasonable degree of uncertainty as to the meaning of the claim term “mining processor.”

63. As such, it is my opinion that a POSITA would not have understood what is meant by “mining processor” in each of independent claims 1 and 24, and, through their dependence thereon, each of dependent claims 2-23 and 25-41.

iii. “adapted to mine transactions”

⁴ Original claim 13 also recites “the mining processor comprises a plurality of mining processors.” Likely realizing how confusing this is, Patent Owner removed this language from claim 13 in the July 4, 2022 amendment.

64. Independent claims 1 and 24 both recite that “the mining processors are connected to the network interface and **adapted to mine transactions** associated with the blockchain database.” [EX1001, claims 1 and 24]. However, the claim term “adapted to mine transactions” is also unclear. The specification of the ‘372 Patent does not describe any particular indicia that would demonstrate that a particular computing device was “adapted to mine transactions.” The specification mentions the term “adapted” twice, without any explanation of its meaning. [EX1001, 3:6-9 and 15:30-33]. Consequently, a POSITA would have no idea which adaptations were needed to make a functioning system, much less which adaptations would result in an infringing system and which would not.

65. During prosecution, Upstream amended claim 1 to add the term “adapted to mine transactions” [EX1002, 210 and 213] and argued that “[b]lockchain mining is not synonymous with regular data center processing and cannot be compared as such.” [EX1002, 222]. Thus, Upstream relied on the term “adapted to mine transactions” to distinguish over “regular data center processing” prior art. However, Upstream did not define anywhere in the specification the bounds of the term “adapted to mine transactions.” It is unclear whether the term “adapted to mine transactions” requires any specific hardware change to a generic computer, and exactly what the specific changes would be.

66. In my opinion, it was well-known that any generic computer with a CPU can mine digital currency or other blockchain-related transactions.⁵ [EX1009, 40 (“CPU mining”); EX1025, Table 1 (listing various mining devices)]. For example, the website Brave New Coin reports that, although Bitcoin-brand digital currency can no longer be profitably mined with a standard PC,

⁵ It is noteworthy that the ‘372 patent claims do not require the mining devices to mine Bitcoin. Consequently, the claims encompass mining any blockchain-related, including mining digital currencies other than Bitcoin.

there still exists other brands of “[c]rypto you can mine from a home computer in 2023.” [EX1022, 1]. In the MAGS system described in EX1014, various generic computers (e.g., laptop 1804 and desktop PC 1806) are connected to control various aspect of the system. [EX1014, FIGS. 14 and 18, [0260]-[0263], and [0273]]. By reciting “adapted to mine transactions,” a POSITA would not have known whether such generic computers would infringe or additional hardware changes are required, and thus would not have been able to determine the scope of this term with reasonable certainty.

67. Thus, it is my opinion that a POSITA would not understand what is claimed by “adapted to mine transactions” in each of independent claims 1 and 24, and, through their dependence thereon, each of dependent claims 2-23 and 25-41.

XI. ANALYSIS OF THE CLAIMS OF THE '372 PATENT (WRITTEN DESCRIPTION)

68. Based on my knowledge and experience and my reading of the '372 patent, I believe that the Challenged Claims lack written description.

69. As discussed above, during prosecution, to overcome prior art rejection, independent claims 1 and 24 were amended to recite a plurality of “blockchain mining devices” as opposed to “a blockchain mining device” [EX1002, 210 and 213]. In the remarks of the office action response, Upstream argued that “Belady teaches a [singular] gas-powered data center.” [EX1002, 223]. Upstream explained that independent claims 1 and 24 were amended to “clarify that there are plural blockchain mining devices, as supported by the application as filed, for example, original claim 13.” [EX1002, 218].

70. However, original claim 13 does not contain the term “blockchain mining devices.” Instead, original claim 13 recites “[t]he system of claim 12 in which: the **mining processor** comprises a plurality of mining processors; and the controller is connected to modulate the

maximum power load level by increasing or decreasing a maximum number of mining processors that are engaged in mining transactions.” [EX1002, 545]. In fact, the term “blockchain mining devices” appears nowhere in the specification as filed.⁶ Nor does the specification explain how multiple “blockchain mining devices” can be connected to the same system, or how to modulate the power load level of multiple “blockchain mining devices.”

71. Thus, a POSITA would have concluded that the inventor never envisioned and did not have possession of a system containing a plurality of blockchain mining devices, as of the filing date of the ‘372 patent. Indeed, the singular form of the term “blockchain mining device” appears in the specification 45 times—not once does the specification use the plural form “blockchain mining devices.”

72. Thus, independent claims 1 and 24 are invalid for lacking the required written description for this limitation, and dependent claims 2-23 and 25-41 inherit the same insufficiency and are invalid for the same reasons.

XII. ANALYSIS OF THE CLAIMS OF THE ’372 PATENT (MEANS-PLUS-FUNCTION)

73. Claims 13-16 recite “the controller” to perform these functions, respectively “limit the power load level to at or below a power level producible by the generator when the production rate is at the daily minimum production rate”; “divert to a load bank excess electricity produced by the generator”; “limit the power load level to above a power level producible by the generator”; and “operate a cooling system to maintain the blockchain mining devices within a predetermined operating range of temperature”.

⁶ The Abstract recites “portable mining devices.” This is a different term, and, in any case, the addition of the term “portable” supports the construction that the term “blockchain mining devices” refers to mobile data centers (which are described as being “portable” [EX1001, 2:25-42]), as opposed to mining servers.

74. Claims 10-12, 23, and 35-40 do not explicitly recite the term “controller” but recite functions that are described as functions performed by the “controller” in the specification. For claim 10, the function, “modulate a power load level exerted by the blockchain mining devices on the generator, by increasing or decreasing the mining activity of the mining processor,” is described as being performed by the controller. [EX1001, 3:13-16, 4:22-25, 17:40-42, 17:51-55, 18:6-7]. For claim 11, the function, “modulate the power load level by selecting one or more actions from a group of actions consisting of increasing or decreasing a maximum number of mining processors that are engaged in mining transactions,” is described as being performed by the controller. [EX1001, 3:16-20, 17:6-9, 17:55-60, 17:28-30]. For claim 12, the function, “modulate the power load level in response to variations in a production rate of combustible gas,” is described as being performed by the controller. [EX1001, 3:23-25, 17:46-51, 17:61-64]. For claim 23, the functions, “selectively supply the continuous flow of gas to the generator, the combustible gas disposal device, or both the generator and the combustible gas disposal device, to selectively divert the continuous flow of gas to the combustible gas disposal device, the generator, or both the generator and the combustible gas disposal device, respectively,” is described as being performed by the controller. [EX1001, 18:40-45]. For claim 35, the function is the same as in Claim 10. For claim 36, the function is the same as in Claim 11. For claim 37, the function is the same as in Claim 12. For claim 38, the function is the same as in Claim 13. For claim 39, the function is the same as in Claim 14. For claim 40, the function is the same as in Claim 15.

75. “Controller,” as used in the ’372 Patent, connotes no definite structure and serves as a catch-all black box that can do any of the claimed functions without explanation. Although the recital of “controller” in a vacuum connotes many different structures [EX DICTIONARIES], often when “controller” is recited with a particular function it can connote a specific structure. For

example, Claim 16 recites the function of operating a cooling system, and this would immediately connote, at minimum, some kind of thermostat. However, in view of all the aforementioned claimed functions, no particular structure, known to a POSITA would come to mind capable of performing all of the claimed functions. For example, another of the claimed functions in Claim 23, “selectively supply the flow of gas” would require a radically different kind of electromechanical device from the temperature controller to control the valve supplying the distribution tree. Furthermore, “controller” is not defined anywhere in the specification nor does the specification explain how it performs any of the claimed functions. In fact, the specification teaches that the claimed controller is not “the controller” that actually performs the claimed function of increasing or decreasing the mining activity of the mining processor. In several instances, the Patent says that the controller 86 is responsible for modulating the mining activity of the mining processor. [EX1001, 17:51-55, 18:6-7]. Yet, the specification explains that a mining processor is at least a power supply, controller board, and mining circuitry wherein the mining circuitry includes another controller responsible for regulating processing frequency (mining activity). [EX1001, 17:9-21]. This incongruity indicates that the “controller” 86 is not the right structure for performing the claimed function.

76. “Controller” is not defined anywhere in the specification, and every time it is recited in the specification, it is described in terms of its output—the functions it is claimed to perform. [EX1001, 3:13-16, 3:18-20, 3:23-25, 3:29-34, 3:43-46, 4:22-25, 17:25-29, 17:47-55, 17:56-18:15, 18:21-27, 18:40-43, 18:55-61]. For example, “[t]he controller 86 may be connected to modulate a power load . . . for example by increasing of decreasing the mining activity, or hashrate, of the mining processors 92.” [EX1001, 17:51-55]. Also, “[i]n some cases the controller 86 or another suitable device, may divert gas from reaching engine 24, for example[,] to a suitable

gas disposal or storage device, such as an atmospheric vent, a flare, or other device.” [EX1001, 18:40-43].

77. Considering that “controller” connote no sufficiently definite structure for performing the recited functions, the Patent specification fails to disclose adequate structure for performing most of the recited functions.

78. For claims 10 and 35 and indirectly claims, 12, 13, 15, 37, 38, 40, and 41, “increasing or decreasing the mining activity of the mining activity of the mining processor,” the Patent discloses no algorithm, in any understandable form. Furthermore, there is a lack of physical structure as well. The specification does not explain how the controller 86 interface with the mining processors to control their mining activity. As described above, there is a different controller responsible for the control of the mining activity and the Patent does not disclose how the controller 86 interfaces with that controller or how it manages the plurality of mining processors.

79. For claims 11 and 36 and indirectly claims, 12, 13, 15, 37, 38, 40, and 41, “increasing or decreasing the maximum number of mining processors engaged in mining,” the Patent discloses no algorithm, in any understandable form. Furthermore, there is a lack of physical structure as well. While the Patent discloses a network connection for remote/manual programming and a connection to a contactor panel for disconnecting/connecting processors, there is a lack of disclosed input for modulation in response to production. FIG 4, reproduced below with the relevant connections encircled, shows the interconnection with the “controller” 86. Even with input and output structure, this is a computer-based means-plus-function term. The embodiment describing the use of the contractor panel recites a programmable logic controller (“PLC”), which is a type of generic computer that can be programmed to do many functions. The

disclosure of potential inputs and outputs does not explain how to program the PLC; therefore, not disclosing the requisite algorithm.

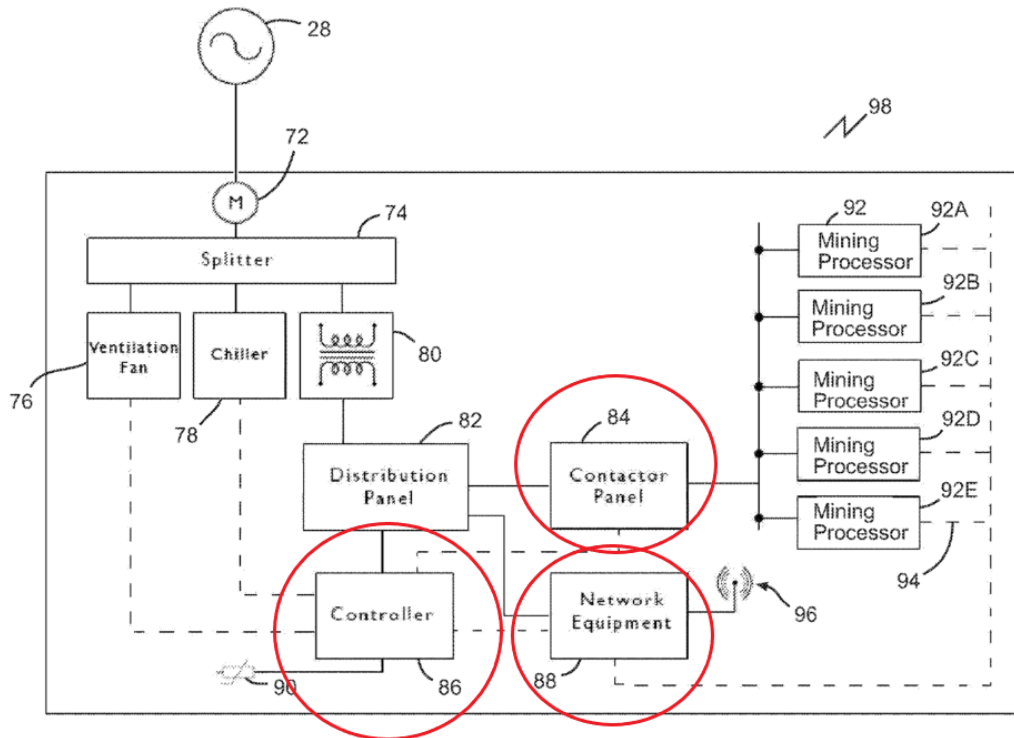


Fig. 4

80. For claims 14 and 39 “diverting to a load bank excess electricity produced,” the Patent discloses no algorithm, in any understandable form. Furthermore, there is a lack of physical structure as well. The specification does not disclose any connections between the generator and the load bank under control of the controller 86. Additionally, there is no disclosure as to any connection that would inform the controller of a surplus of electricity. The most description given

83. I may continue my examinations. I may also receive additional documentation and other factual evidence over the course of this PGR that will allow me to supplement and/or refine my opinions. I reserve the right to add to, alter, or delete my opinions and my declaration upon discovery of any additional information. I reserve the right to make such changes as may be deemed necessary.

84. In signing this declaration, I recognize that the declaration will be filed as evidence in an PGR before the PTAB. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross- examination.

85. 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: September 25, 2023



Vernon Kasdorf

APPENDIX A

Curriculum Vitae

Vern Kasdorf
604-309-4569 Cellular

Employment Overview

KubeData Systems Inc. - February 2020 – present

Position Summary -

KubeData Systems Inc. provides senior, strategic IT consulting services to mining companies, IoT companies and large Enterprise organizations. KubeData provides software and hardware development services to various companies, with a focus on the IoT (Internet of Things) vertical. Another offering is Strategic IT review services for operational effectiveness, merger and acquisition activities or regulatory compliance.

Loop Insights Inc. - March 2019 – January 2020

Position Summary -

As the CIO at Loop Insights, I was responsible for all aspects of technology delivery. Loop Insights is an IoT startup in Vancouver, BC, providing retail analytics to brands, agencies and data partners to build personalized customer experiences and loyalty. The proprietary IoT technology derives real-time, actionable insights based on each individual item purchased. This deeper insight into retail purchasing operates independently of the existing legacy POS systems and can roll up insights across multiple store locations, across a whole brand or across a whole industry by region.

At Loop, I developed a cutting edge cloud analytics service, based on data from our proprietary, cellular-connected IoT devices. I also led the team that developed the hardware and firmware products necessary to collect the retail transactional data.

TELUS – January 2016 – March 2019

Position Summary -

Director, IoT Delivery & Support

The Director, IoT Delivery & Support is responsible to support two teams. The Delivery team is made up of a Solutions Architect and Project Managers that implement any complex IoT solutions that are sold by TELUS. The Delivery team also works closely with the Sales Specialists and technical resources through the solutions architect to ensure the design of the complex solutions are valid, supportable and capable of being implemented by the Delivery team.

The Support team is made up of an Operations Manager that supports a number of virtual teams that include a dedicated IoT level 1 Service Desk called the IoT Center of Excellence. This team of nine provides the first level response to IoT incidents, supports the sales team in presale activities like provisioning trial kits as well as supporting the client with post sales care with items such as billing issues and SIM orders. The Support team also relies on a shared second level network support team as well as a 3rd level support team in Wireless Network Operations. These virtual teams work together to provide end to end care and support for the IoT clients.

Designed and developed (in house development team) an IoT Platform for TELUS to manage all IoT clients, manage the onboarding of all new clients, automate deployment of complex networking products and provide self-serve sales to increase sales and profitability.

KubeData Systems Inc. – July 2013 – December 2015

Company -

KubeData Systems Inc. manufactured custom built, Hi-tech Mobile Structures. These include data centers, control rooms, and communication shelters. While the focus was primarily the mining and petroleum industries, the launch of a new product, the CryptoKube, addressed the demand for an Industrial cryptocurrency mining mobile data center and was also our first 100% free-cooled data center. KubeData designed and built three generations of CryptoKube mining data centers, servicing the Canadian and US market. KubeData has completed projects for petroleum companies, mining companies, a submarine manufacturer and even the US Navy. KubeData also provides IT consulting for several large organizations headquartered in Vancouver.

Position Summary -

Owner and partner in KubeData Systems Inc. with a focus on product development, business development and IT strategic consulting.

Accomplishments:

- Designed three data center models, marketing to the mining, oil and gas and cryptocurrency industries
- Started selling two of the models into both the mining and cryptocurrency verticals
- Extensive experience in not only building industrial cryptocurrency mining data centers, but also mining Bitcoin
- Built other enclosures such as pump enclosures for mining, electrical enclosures for oil and gas and control system enclosures to operate research submarines
- IT Strategic Consulting to Goldcorp (the world's largest gold miner), RECBC (Real Estate Council of British Columbia) and Pavco (BC Place and the Vancouver Convention Center)

Bulldog Containers – October 2012 - June 2013

Company -

Bulldog Containers. manufactured custom built, Hi-tech Mobile Structures. These include data centers, control rooms, and communication shelters. While the focus was primarily the mining and petroleum industries.

Position Summary -

Partner in Bulldog Containers with a focus on mobile data center product development.

Teck Resources Limited – August 2006 – September 2012

Company -

Teck Resources Limited employs over 14,000 staff, with ownership or interest in 13 mines and one smelter in Canada, Chile, USA and Peru. Teck is focused on copper, steelmaking coal, zinc and energy, and is also a significant producer of specialty metals such as germanium and indium. With sales of over 11 billion dollars in 2011, Teck was the largest company in British Columbia.

Position Summary -

Director, Global IS Infrastructure, is primarily responsible for IS Infrastructure Operations and project delivery across approximately 50 mine and office sites. This includes all common infrastructure such as physical access security, computing security, data center facilities and operations, Microsoft SQL, unified communications and global networks. The Director, IS Global Infrastructure was also responsible for Infrastructure Architecture and for a major projects support function to provide IT support for the

major capital projects (almost 20 billion in new and expanded mines). The major projects function provided heavy IT involvement in the pre-feasibility and feasibility stage of these types of projects which had never been done before.

Other responsibilities:

- Responsible for global data center operations
- Started the PMO and ran it for 2 years
- Developed the IT purchasing department and ran it for 4 years, saving \$8 million dollars in the best year
- Worked closely with the VP, Risk and Security while running the IS Security function (physical access security and logical security)
- Spearheaded the major projects support function
- Developed and ran the IT architecture group for 5 years
- Integrated two large acquisitions (Elk Valley Coal Corp. - \$15 Billion, and Aur Resources – 4 billion) into Teck common infrastructure

Accomplishments:

- Complete global standardization of server virtualization, storage systems, backup software, IP telephony (8500 handsets), monitoring systems, server patching systems, DMZs, firewalls, Microsoft SQL, video conferencing
- Primary global data center move from Vancouver to Calgary
- Several major data center consolidations as a result of large mergers
- Global backup and DR data center built and maintained actively
- Successful data center contract negotiations in both Canada and Chile
- All backups centralized to the Toronto DR datacenter (over 2 Pb of backup data)
- Achieved greater than 92% server virtualization globally
- Developed and rolled out a standard Cisco IP telephony system at every location
- Developed a standard MPLS network for all production sites and major offices globally
- Heavy involvement in SOX compliance management. Achieved zero significant deficiencies in 2011
- Completed the Emerging Leader Program, an internal program designed to groom hand selected individuals for senior leadership positions. A total of 64 people completed the course of the over 14,000 people at Teck Resources.

Barrick Gold Corporation (Placer Dome Inc.) – Oct 2005 – August 2006

Company -

Vancouver-based Placer Dome Inc. employed 13,000 people, primarily mining gold and copper at 16 mining operations in seven countries. In January of 2006, Barrick Gold Corp bought a controlling interest in Placer Dome, making Barrick the largest gold mining company in the world. The new company now employs over 20,000 people in 10 countries with 26 operating mines.

Position Summary -

Manager, IT Projects role included responsibility for all IT projects that had a global footprint including Active Directory rollout, SMS rollout, WAN upgrades, Datacentre upgrades, Livelink (document management) rollout, VOIP deployments, SAP rollout infrastructure preparation, and LAN upgrades. These projects spanned all locations on 4 continents. In addition to coordinating these projects, was tasked with building a formal PMO office. Was also responsible for vendor management and held the multi-million dollar central IT budget.

SPI Service Partners Inc. - (Self Employed) – Dec 2002 – Dec 2005

Company -

Service Partners provides IT consulting services to businesses in Vancouver and the Lower Mainland with a focus on IT infrastructure management, process development and project management. SPI also released a commercial software product called Processing Centre. This software is designed for large liquidation company warehouse operations to sort, label, manage and warehouse incoming shipments. This software was sold to clients in British Columbia, California and Washington State.

Enterprise Contracts

Placer Dome – Contracted by Placer Dome (1.8 Billion, 13,000 employees worldwide), a gold and copper mining company, to project manage the integration between handheld barcode scanning computers and SAP. These handheld computers are used in the warehouse to issue goods and perform inventory functions at the mine sites. The software was customized by Psion Teklogix to provide the integration with a four month old implementation of SAP.

Intrawest Corporation – Contracted by Intrawest (1.5 Billion, 22,000 employees worldwide) to project manage a data centre configuration management initiative.

Terasen Gas – Contracted by TELUS (\$7 Billion, 24,000 employees) to assist them with their IT outsourcing client Terasen Gas (\$1.8 Billion, 1400 employees). The contract included process development, contract analysis, increasing profitability, documentation project assistance and service level reporting cleanup.

MTF Discount Warehouse – MTF (8 locations and 2 warehouses) is a freight damaged liquidator with a contract to purchase most of the store returns and shelf pulls from the Costco warehouses in BC. They required a consulting firm to manage and architect their IT infrastructure. We assisted MTF in developing an IT strategy to network their locations, move to POS systems in their retail store locations and streamline their warehouse operations with a combination of custom software and a warehouse management system written and deployed by Service Partners.

Fluent Solutions - (dba Impact Creative Visual Communications) - Feb. 2000 –March 31, 2002

Company -

Impact Creative was a full service visual communications studio providing strategic design, branding and marketing solutions for 13 years. Services include graphic design, video production, commercial photography, multi-media design, website and Internet application development. Impact Creative was acquired on October 19, 2000 by Fluent Solutions of Novato, California.

Position Summary -

Technical Director of the Canadian operations of Fluent Solutions involved managing the IT resources of the company, providing leadership and architectural direction to the web application developers, and managing the rollout, operations and sales of web application solutions.

ISMBC (now TELUS) Aug. 1996 – Nov. 1999

Company -

ISMBC was an IT management and application development outsourcing company operating across Canada and the Pacific Rim. With 1600 employees and \$300 million in revenue, ISMBC was a company that was a major contender in the IT management sector.

Client List -

Below is a list of outsourced clients I managed over three years at ISMBC:

- Scott Paper – New Westminster to Quebec
- Finning – Client Acquisition
- ISMBC (internal client) – 1600 employees, 15+ locations

- Ainsworth Lumber – Data Center move and ongoing management
- BCTel (TELUS) – 7 different divisions of TELUS
- West Coast Energy – 17 million dollar Datacenter
- Versacold – Multi-location cold storage client

Education

Trinity Western University – BA, Business Administration (1992)