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Paper 7
Date: January 5, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DEFI EDUCATION FUND,
Petitioner,

v.

TRUE RETURN SYSTEMS, LLC,
Patent Owner.

IPR2023-01388
Patent 10,025,797 B1

Before KEVIN F. TURNER, JEFFREY S. SMITH, and CHRISTA P. ZADO, *Administrative Patent Judges*.

ZADO, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

DeFi Education Fund ("Petitioner") filed a Petition (Paper 1, "Pet." or "Petition") to institute an *inter partes* review of claims 1–20 ("the challenged claims") of U.S. Patent No. 10,025,797 B1 (Ex. 1001, "the '797 patent"). True Return Systems, LLC ("Patent Owner") timely filed a Preliminary Response. Paper 6 ("Prelim. Resp.").[1]

An *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Upon consideration of the current record, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing the unpatentability of

[1] The sole named inventor of the '797 patent, Jack Fonss, signed and filed the Preliminary Response, despite having designated lead counsel. Prelim. Resp. 48; Certification of Word Count and Certification of Service filed with Preliminary Response; Paper 4, 1. Previous PTAB panels have followed the rule that an inventor may not proceed *pro se* before the PTAB when the challenged patent is assigned to an entity other than the inventor. *Motorola Mobility, LLC v. Arnouse*, IPR2013-00010, Paper 24 at 3 (PTAB Mar. 21, 2013) ("If ADD [corporation] is effectively the patent owner, Mr. Arnouse [named inventor] may not represent himself as a *pro se* patent owner."); *Motorola*, IPR2013-00010, Paper 30 at 6–7 (April 19, 2013) (denying the named inventor's request to appear *pro se* because the real party in interest "is a corporation, a juristic entity that can only appear through counsel."); *Shire Dev. LLC v. LCS Group LLC*, IPR2014-00739, Paper 9 at 2 (PTAB Nov. 21, 2014). Here, the '797 patent is assigned to an entity other than the inventor, per Patent Owner's mandatory notice identifying True Return Systems, LLC as the real party in interest and sole assignee of the '797 patent. Paper 4, 1. This raises the issue of whether Jack Fonss may appear *pro se* before the PTAB in this proceeding, or whether Patent Owner must be represented by legal counsel.

at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

B. Real Party-in-Interest

Petitioner identifies itself as the real party in interest, and "[w]ithout conceding that the following parties are in fact real-parties-in-interest, [further] identifies the DAI foundation, Andreessen Horowitz (a16z), and Paradigm." Pet. 15. Patent Owner identifies itself as the only real party in interest. Paper 4, 1.

C. Related Matters

The parties identify the following as related district court matters:

True Return Systems, LLC v. MakerDAO, No. 22-cv-08478 (S.D.N.Y.) (filed Oct. 5, 2022); and

True Return Systems, LLC v. Compound Protocol, No. 22-cv-08483 (S.D.N.Y.) (filed Oct. 5, 2022).

Pet. 15; Paper 4, 1.

D. Technology Background

The technology relates to distributed computerized ledgers (DCLs). Ex. 1001, 1:41. A DCL is a computerized ledger that is distributed to several connected nodes, wherein each node stores its own official copy of the ledger. *Id.* at 1:41–48. The copies are proofed for accuracy by consensus from all nodes (i.e., all nodes agree that a particular entry is accurate before storing it). *Id.* Because a copy of the ledger is distributed to each node, rather than stored on a single server, and has been consensus proofed, risk of data loss and data corruption is decreased. *Id.* at 1:55–60.

A well-known DCL format is blockchain. *Id.* at 2:24–25. Rather than process each transaction (e.g., ledger entry) individually, for efficiency multiple transactions are grouped and processed together in a block. *Id.* at 2:14–29; Ex. 1008, 5. The processed blocks are ordered by consensus among nodes. Ex. 1008, 5; Ex. 1001, 2:18–23. Each block references its predecessor, which implies a chain data structure, or blockchain. Ex. 1008, 5; Ex. 1001, 2:14–29.

A well-known application of blockchain is cryptocurrency. Ex. 1001, 1:49–52; Ex. 1011. Within the context of cryptocurrency, each transaction is verified through the use of, e.g., cryptographic keys. Ex. 1011, 2. Because each node must verify the transaction though use of the key(s) (by performing, e.g., a computationally intensive hash), significant processing power is required. Ex. 1001, 2:30–45. In addition, the computational burden slows networks. *Id.*

Although storing a copy of ledger data at every node has benefits (e.g., reducing risk of data loss and data corruption), it also has drawbacks, e.g., storing the data to multiple nodes uses network transmission and storage resources. *Id.* In recognition of the benefits and drawbacks, Eberhardt[2] describes having certain data "on-chain" (i.e., distributed) and certain data "off-chain" (i.e., non-distributed), depending on whether the data "has to be on the chain" or whether it "can be off the chain," "while retaining the properties and benefits associated with blockchains." Ex. 1008, 4.

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[2] Eberhardt, Jacob, et al., "On or Off the Blockchain? Insights on Off-Chaining Computation and Data," IFIP International Federation for Information Processing (2017). ("Eberhardt," Ex. 1008).

E. The '797 Patent (Ex. 1001)

The '797 patent is titled "Method and System for Separating Storage and Process of a Computerized Ledger for Improved Function" and relates generally to a distributed computerized ledger (DCL) system. Ex. 1001, code (54), 1:16–25.

The '797 patent explains that "[a] computerized ledger records encrypted or otherwise secured records of transactions." *Id.* at 1:32–33. A distributed computerized ledger (DCL) may be implemented in a system

> where all nodes are independently connected to each other, and the management and modifications to the computerized ledger in a distributed environment are generally performed by separate computers and each computer usually stores its own official copy of the computerized ledger which is proofed for accuracy by a consensus system running on the decentralized network.

Id. at 1:41–48. According to the '797 patent, DCLs have various advantages over other transaction/storage systems, including

> ability to perform simultaneous updates across multiple fully independent nodes, decreased risk of data loss and corruption through widely distributed consensus-proofed copies, and the ability to create peer-to-peer environments where network validated transactions can be executed with or without a central intermediary.

Id. at 1:55–60. However, DCLs also have various disadvantages:

> Developers of DCL technology face a number of competing tradeoffs and challenges in function and practical implementation. For example, some of these competing tradeoffs and challenges include secrecy of data, privacy of transactions, speed of recording transactions, speed in updating records, speed in storage and transmission, and full security of the transactions record trail. Typically DCLs engage in redundant movement of transaction data on a peer-to-peer basis such that there is independent processing at every relevant node

> to facilitate different forms of consensus control and audit, often without the services of a central administrator.

Id. at 2:12–23.

The ’797 patent discloses embodiments that it states are based on storage processes and architecture that are alternative to current DCL processes and architecture. *Id.* at 5:11–12. The disclosed embodiments

> [are] directed at separating the processes and storage of DCL computers, networks and systems, where only those items required for transaction record keeping are maintained in the fully distributed ledger, and all other data, functionality, and processing is stored in a system of decentralized or centralized storage and processing, linked to the distributed ledger through a combination including timestamps, cryptographic strings, cryptographic nonces, or identifying keys.

Id. at 5:13–21.

As will be evident in the discussion below, in disclosing storage processes and architecture, the ’797 patent uses terminology that does not appear to be standard in the art. Figure 2 of the ’797 patent, reproduced below, helps illustrate the disclosed embodiments.

FIG. 2

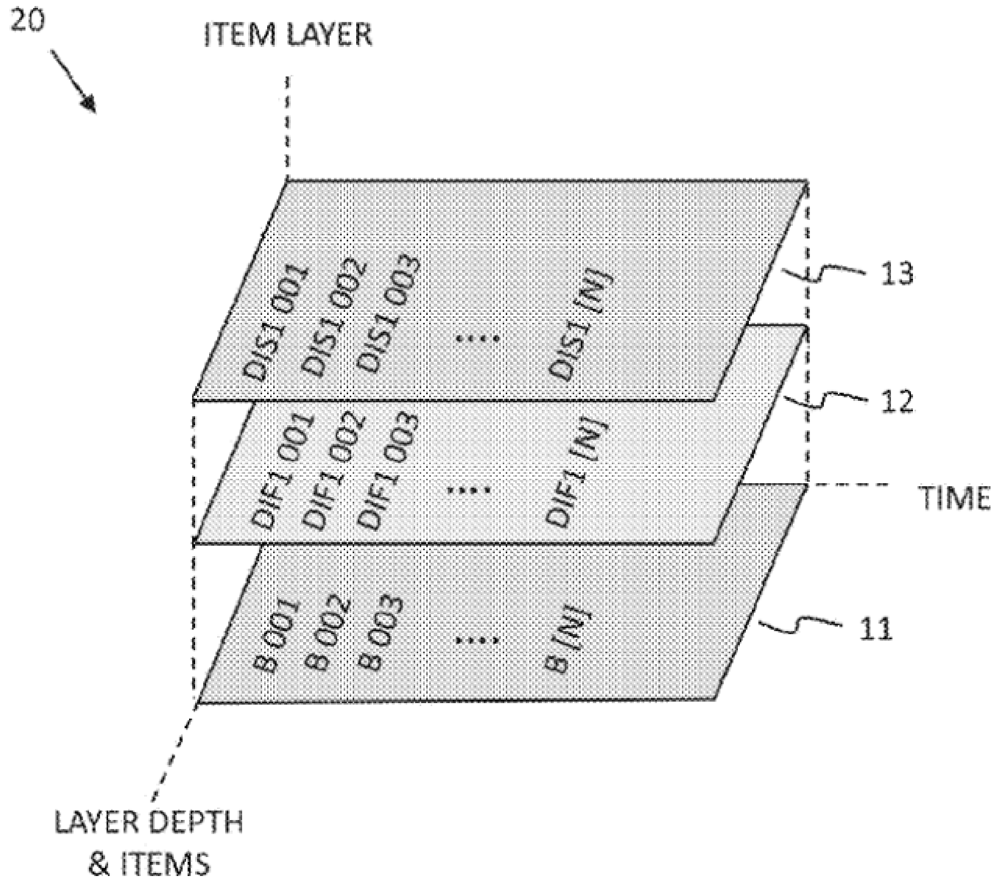

Figure 2 is a diagram illustrating population of data items in a storage array including base DCL layer and parallel storage of differences layers (PSDLs). Figure 2 includes base DCL layer 11, PSDL 12, and PSDL 13.[3] Base DCL layer 11 is a single layer in which

> computerized ledger transaction records are created and modified including the actions of writing, appending, and reading, where the base electronic ledger resides on a distributed or decentralized ledger.

Id. at 9:7–11. Moreover,

[3] Figure 2 is an extension of Figure 1. Ex. 1001, 9:5, 10:9–10. Accordingly, in describing Figure 2, we also refer to descriptions of Figure 1.

> All of the transaction records reside on the base electronic ledger 11, and transaction records may be appended to the ledger grouped within blocks or appended individually. Transaction records will be identifiable by at least one of a system timestamp, a network timestamp, a unique system generated identifier, or a cryptographic identifier.

Id. at 9:11–17.

Each PSDL stores at least one system written and system accessible time sequenced differential or descriptor. *Id.* at 9:28–30. The '797 patent explains that differentials are

> created by the system from exogenous and electronically published data streams, and where at least one differences processing engine running on the system computes and stores time sequenced differences from values in the published data stream. Differentials recorded on a PSDL may also include descriptive differentials which can indicate difference types, grades, timeframes or other discriminatory identifiers; descriptive differentials may be utilized with or without data stream differentials. In certain implementations, a descriptive differential is an indirect reference to electronically published data streams; for example a descriptive differential which indicates a certain type of steel of a certain grade to a DCL unit imparts a delivery obligation or value which aligns with one or more electronically published data streams.
>
> The differences residing on a PDSL are applied to the units (or interests) of a DCL upon a system occurrence of an action or process including a value polling, a distribution, a resolution or settlement, or other processes requiring the supplementary data in the PSDL. Cryptographic encoding, transaction validation, and consensus proofing process operations on the DCL may or may not access PSDLs. The system may apply each PDSL to the related units in sequence (i.e. PSDL1, then PSDL2) or simultaneously (i.e. PSDL1 and PSDL2 at the same time). Examples of the time sequenced exogenous and electronically published data include: (i) the prices of computer memory storage devices, (ii) prices of crude oil of differing grades, at

> different delivery points, denominated in different currencies, (iii) voter counts in statewide election by demographic, party affiliation, and geographic location.

Id. at 9:30–61.

In pertinent part, a copy of base DCL layer 11 resides on each of multiple network nodes, whereas PSDL 12 data and related processes and PSDL 13 data and related processes are not distributed to every node within the network, and in some implementations, all PSDL items are maintained on centralized devices (or if maintained on a decentralized device, the device is limited). *Id.* at 9:63–10:4.

Figure 2 further shows sequenced blocks stored in base DCL layer 11, namely blocks B 001 through B 00N. *Id.* at 10:26–30. Figure 2 also shows differential items stored in PSDL 12 and PSDL 13. *Id.* PSDL 12 stores differential items DIF1 through DIFN, and PSDL 13 stores differential items DIS1 through DIS12. *Id.* at 10:30–34. Values 001 through N indicate time alignment of base DCL layer 11 transaction records and PSDL 12 and PSDL 13 items. *Id.*

F. Challenged Claims

Petitioner challenges claims 1–20 of the '797 patent. Pet. 16. Claim 1 is reproduced below with annotations in brackets as set forth in the Petition.

> 1. A computer based method comprising:
>
> [1a] creating at least one electronic parallel storage of a differences layer linked to a distributed computer ledger (DCL); the DCL contains an electronic transaction record by a time-sequenced value or a time-sequenced string;
>
> [1b] accessing and storing a value through the at least one electronic parallel storage of the differences layer, the value from a group comprising of at least one time-sequenced electronically

> published data stream and at least one descriptive differential, wherein at least one differences processing engine running or a specialized computer system creates and stores parameters from a group comprised of a measurement differences and a descriptive differences;
>
> [1c] storing the DCL containing an electronic transactions record on at least one of a distributed network of connected independent computers or a decentralized network of computers wherein the electronic transaction record is time sequenced, and a writing or an appending of the electronic transaction records is performed on the distributed network of connected independent computers or the decentralized network of computers;
>
> [1d] storing the at least one electronic parallel storage of the differences layer on at least one of a centralized storage device controlled by the specialized computer system or a decentralized storage device controlled by the specialized computer system for increasing functionality and utility of the DCL, reducing data storage requirements, eliminating transmission of redundant data, and improving data security;
>
> [1e] linking the electronic transaction record in the DCL to records of the at least one electronic parallel storage of the differences layer utilizing at least one time sequenced value, string, code, or key; and
>
> [1f] imputing at least one measured differential with a descriptive identifier or at least one descriptive identifier to the electronic transaction record of the DCL through data storage and processing on the at least one electronic parallel storage of the differences layer.

Ex. 1001, 18:5–45.

G. Asserted Prior Art References and Declarations

Reference or Declaration	Date	Exhibit No.
U.S. Pub. 2017/0005804 A1 ("Zinder")	Jan. 5, 2017	Ex. 1004
U.S. Pub. 2017/0230189 A1 ("Toll")	Aug. 10, 2017	Ex. 1005
U.S. Pub. 2017/0352027 A1 ("Zhang")	Dec. 7, 2017	Ex. 1006
Declaration of Hudson Jameson ("Jameson Dec.")		Ex. 1003

H. Asserted Grounds of Unpatentability

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–20	103	Zinder
1–20	103	Zinder, Toll, and Zhang

II. ANALYSIS

A. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom*

Accessories, Inc. v. Jeffrey-Allan Indus. Inc., 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends "[t]he person of ordinary skill in the art would have a computer science undergraduate degree and 2-4 years of experience with distributed system design or blockchain protocol design." Pet. 28 (citing Ex. 1003 ¶ 37).

Patent Owner contends, with regard to Petitioner's assessment of the level or ordinary skill, "'[A] computer science degree,' even when supplemented with unspecified experience in 'distributed system design or blockchain protocol design' does not necessarily convey skill or expertise, partially because many of the largest blockchain entities have demonstrated major technical flaws in their programming and technical operations; these entities include FTX, Celsius, BlockFi, MakerDAO, and Compound Protocol." Prelim. Resp. 19–20 (alteration in original). Patent Owner submits that its proposed level "more clearly characterizes a POSITA, by replacing or supplementing the Petitioner's characterization with a person with an undergraduate or advanced degree, formal training in mathematics of markets and instruments, at least 4 years of programming experience at a leading international institution or leading public company, experience with real-time data systems in public or private markets, and a detailed and working knowledge of blockchains with at least 2-4 years of related experience." *Id.* at 20.

Based on the record presented, including our review of the '177 patent and the types of problems and solutions described in the patent and the cited prior art, we adopt Petitioner's assessment of the level of ordinary skill in the art. Patent Owner's argument that unspecified industry experience does not necessarily convey skill or expertise because "many of the largest blockchain entities have demonstrated major technical flaws in their programming and technical operations," is not supported by evidence. Patent Owner has not submitted any evidence that blockchain entities have major technical flaws in their programming and operations. Moreover, a person having ordinary skill in the art is a legal construct of a hypothetical person who is presumed to have known the relevant art at the relevant time, rather than actual person who worked at a specific company. *See* MPEP § 2141.03 (9th ed. Rev. 07.2022, February 2023).

In addition, the "statutory emphasis is on a person of *ordinary* skill." *Standard Oil Co. v. America Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985); *see also Graham*, 383 U.S. at 17. "The 'hypothetical "person having ordinary skill in the art" to which the claimed subject matter pertains would, of necessity have the capability of understanding the scientific and engineering principles applicable to the pertinent art.'" MPEP § 2141.03 (citing *Ex parte Hiyamizu*, 10 USPQ2d 1393, 1394 (BPAI 1988)). At this stage, it appears Patent Owner's proposed level is directed toward a level of skill that is higher than ordinary.[4]

To the extent the parties disagree as to the level of ordinary skill in the art, the parties may address the issue in their papers during trial and explain,

[4] It bears mention that had we adopted Patent Owner's higher level of skill in the art, it would not have altered the outcome of this Decision. *See Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1366 (Fed. Cir. 2012) ("[I]t is generally easier to establish obviousness under a higher level of ordinary skill in the art.")."

for example, how a different definition would impact the obviousness analysis of the challenged claims.

B. Claim Construction

Pursuant to 37 C.F.R. § 42.100(b), we apply the claim construction standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under *Phillips*, claim terms generally are given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17.

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (in the context of an *inter partes* review, applying *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

At this stage of the proceeding, we determine only one claim recitation requires our interpretation.

Claim limitation 1b recites, in pertinent part, "accessing and storing a value through the at least one electronic parallel storage of the differences layer, the value *<u>from a group comprising of</u>* at least one time-sequenced electronically published data stream and at least one descriptive differential." Ex. 1001, 18:11–15 (emphasis added).

Petitioner's arguments raise the issue of whether claim 1 recites a Markush group. Pet. 26–27, 35–36. In particular, Petitioner argues, with regard to the pertinent recitation of limitation 1b, that the language is "alternative claim language." *Id.* at 35. Petitioner also argues, with regard to claims 5 and 19, that their respective recitations of "from a group consisting of" define Markush groups. *Id.* at 26–27.

A Markush claim "recites a list of alternatively useable members." MPEP § 2117 (citing *In re Harnisch*, 631 F.2d 716, 719–20 (CCPA 1980)). "Claim language defined by a Markush grouping requires selection from a closed group 'consisting of' the alternative members." *Id.* (citing *Abbot Labs v. Baxter Pharmaceutical Products, Inc.*, 334 F.3d 1274, 1280 (Fed. Cir. 2003).

Claim 1 recites "from a group comprising of" rather than the typical Markush phrase "from a group consisting of." The phrase "consisting of" is well understood in patent usage as "close-ended and conveys limitation and exclusion." *CIAS, Inc. v. All. Gaming Corp.*, 504 F.3d 1356, 1361 (Fed. Cir. 2007); *see also* MPEP § 2111.03 ("The transitional phrase 'consisting essentially of' limits the scope of a claim to the specified materials or steps 'and those that do not materially affect the basic and novel characteristic(s)' of the claimed invention."). The phrase "comprising," "which is synonymous with 'including,' 'containing,' or 'characterized by,' is inclusive or open-ended and does not exclude additional, unrecited elements or method steps." MPEP § 2111.03.

Claim 1 uses neither the phrase "comprising" nor "consisting of," but rather uses the phrase "comprising of." At this stage, the parties have not briefed how the phrase "from a group *comprising* of" impacts the analysis of whether claim 1 recites alternatively usable members. However, the language "from a group comprising of," in the context of the claim as a whole, appears to convey two alternatively useable members, and we apply this interpretation in this Decision. Our interpretation at this stage is preliminary.

C. Patentability Challenges

1. Principles of Law: Obviousness

A claim is unpatentable as obvious under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.[5] *See Graham*, 383 U.S. at 17–18.

2. Relevant Prior Art

a) Zinder (Ex. 1004)

Zinder is a U.S. Patent Application Publication, published on January 5, 2017, titled "Systems and Methods of Secure Provenance for Distributed Transaction Databases." Ex. 1004, code (12), (43), (54).

[5] The current record does not present or address any objective evidence of nonobviousness.

Zinder relates generally to distributed transaction database computer systems. *Id.* ¶ 2. Zinder provides embodiments relating to trading shares of stocks (*see, e.g.*, *id.* at Figs. 7A–7H), but Zinder's systems are not limited to these types of transactions. Zinder discloses storing a blockchain transaction in a blockchain and storing "other information that is not part of the blockchain transaction into a database or the like." *Id.* ¶ 8. More specifically,

> secure digital provenance is provided for information that is contained in the blockchain transaction because of the cryptographic immutability of the records contained in the blockchain. Other information (e.g., that may be confidential in nature) is stored outside of the blockchain thus securing information that is related to the blockchain transaction that is on the blockchain. Third-parties may be allowed to validate (e.g., audit) the transaction information by reviewing the blockchain transactions. This can be accomplished without reviewing the supplementary information that is not stored as part of the blockchain.

Id. ¶ 9. Figure 1 of Zinder, reproduced below, illustrates storage in the blockchain and in supplementary storage.

Fig. 1

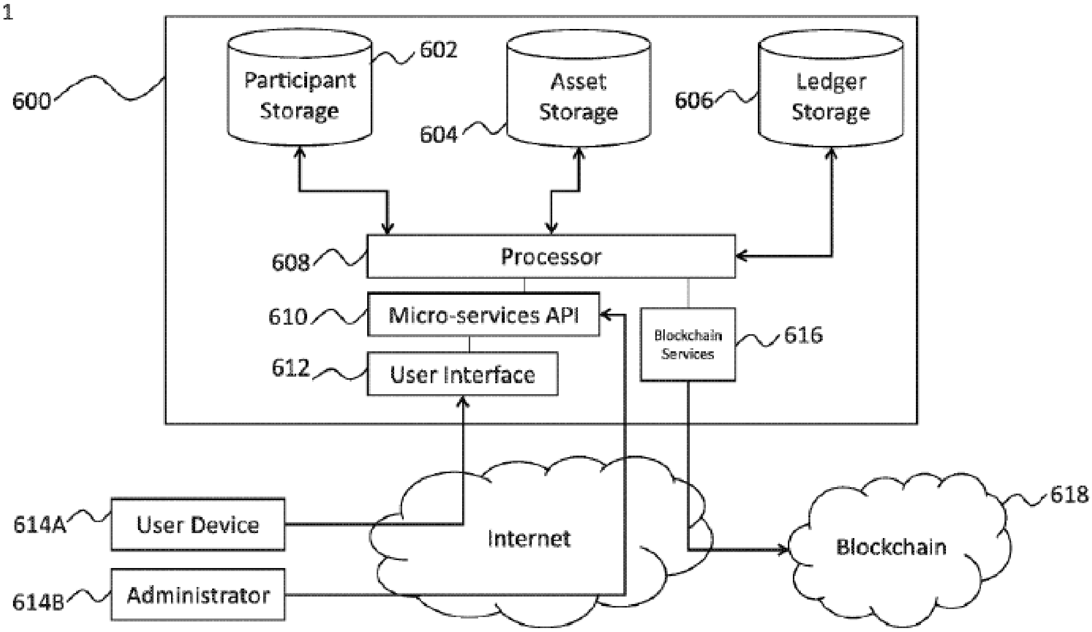

Figure 1 is a block diagram of an exemplary digital asset repository interfacing with a blockchain. *Id.* at Fig. 1, ¶ 36. In pertinent part, Figure 1 includes blockchain 618, and digital asset repository computer system 600 comprising asset storage 604 and ledger storage 606. *Id.* at Fig. 1.

Blockchain 618 may be, e.g., a public, distributed ledger. *Id.* ¶ 42. Blockchain 618 "is maintained, stored, and updated, by multiple different computer nodes that each operate to 'mine' and thereby validate transactions submitted to the blockchain 618." *Id.* ¶ 43.

Asset storage 604 (also referred to as resource storage) includes records of all the assets or resources tracked by digital asset repository computer system 600. *Id.* ¶ 57. Exemplary resources include class of stock share, participant identifier (e.g., name of company issuing the share), unique identifier that identifies the asset on the blockchain, public and private keys, attributes defining the type of asset, number of shares issued for the asset type, when the asset was created, etc. *Id.*

Ledger storage 604 interfaces with blockchain 618 to store records of validated (or to-be-validated) blockchain transactions. *Id.* ¶ 58. Exemplary records include destination identifiers, unique asset identifiers, asset transaction quantities, asset transaction dates, validation dates, price per share, price of asset transaction, etc. *Id.*

b) Toll (Ex. 1005)

Toll is a U.S. Patent Application Publication, published on August 10, 2017, titled "Systems and Methods for Storing and Sharing Transactional Data Using a Distributed Computing Systems." Ex. 1005, code (12), (43), (54).

Toll relates generally to a distributed computerized ledger system (e.g., a blockchain) to store transactional data that can be accessed by a clearing house or other computer system. *Id.* ¶ 2. Toll discloses "[t]he blockchain is a data structure that stores a list of transactions and can be though of as a distributed electronic ledger that records transactions between source identifier(s) and destination identifier(s)." *Id.* ¶ 16. Toll describes using blockchain technology in the context of clearing and settlement processes relating to trades cleared through a clearing house system. *Id.* ¶¶ 17, 22 ("The settlement and/or clearing processes may be implemented in conjunction with blockchain technology)." "The clearing housing computer system interfaces with a blockchain . . . and stored trade and/or position information regarding trades on the blockchain." *Id.* ¶ 23.

Toll incorporates Zinder by reference, stating that certain embodiments described in Toll may incorporate blockchain techniques described in Zinder. *Id.* ¶ 25.

One feature described in Toll that is pertinent to Petitioner's unpatentability arguments is use of a trusted oracle. Toll states that one way to trust that an event (e.g., information relating to a transaction) is true is to receive the event from a trusted source. *Id.* ¶ 39. One way to accomplish this is to have a system (i.e., a trusted oracle) validate events submitted to it, for example by validating an event only if it has been signed by a private key. Exemplary events may include current margin fee, current weather, current price of an instrument traded on an external system, closing price of an index or other instrument, or the like. *Id.*

c) Zhang (Ex. 1006)

Zhang is a U.S. Patent Application Publication, published on December 7, 2017, titled "Authenticated Data Feed for Blockchains." Ex. 1006, code (12), (43), (54).

Zhang relates generally to techniques for providing security for data utilized by blockchains or other types of data consumers. *Id.* ¶ 3. Zhang explains that certain blockchain applications, such as smart contracts, require data input from external data sources such as websites. *Id.* ¶ 4; *see also id.* ¶¶ 29, 60, 62 (disclosing that data sources include HTTPS-enabled websites). According to Zhang, it may be challenging to adequately authenticate data from these external data sources. *Id.* Zhang discloses techniques for authenticating data feeds from external data sources. *Id.* ¶ 5.

D. Claim 1: Obviousness over Zinder

Petitioner presents evidence and arguments that claim 1 of the '797 patent is unpatentable under 35 U.S.C. § 103 as obvious over Zinder. Pet. 28–46.

Patent Owner asserts that Zinder teaches away from each limitation of claim 1. Prelim. Resp. 20–32. Patent Owner organizes its arguments into three sections, wherein each section cross references elements of the previous section.

Specifically, Section 1 labels five disclosures from Zinder as Zinder1 through Zinder5. *Id.* at 21–22.

Section 2 includes five sub-sections labeled 2a through 2e, wherein each sub-section argues that Zinder teaches away from certain features of the ‘797 patent. However, Section 2 makes several arguments and statements that are not commensurate with the actual language of the claims (discussed further below). *Id.* at 24–29. To the extent arguments are directed to features that are not claimed, such arguments do not undermine Petitioner’s showing of unpatentability. Section 2 includes cross references to Zinder1 through Zinder5 to support various arguments.

Section 3 identifies a specific portion of each of limitations 1a through 1f, and for each specified portion, argues that Zinder teaches away from the identified claim language. For support for each identified portion of each limitation, Patent Owner cross references one or more of sub-sections 2a through 2e, which in turn references one or more of Zinder1 through Zinder5. *Id.* at 29–32.

E. Claim 1

1. Limitation 1a

As to limitation 1a, Petitioner shows sufficiently that Zinder’s blockchain 618, which is “maintained, stored, and updated, by multiple different nodes,” teaches a distributed computerized ledger (DCL) (*see*, e.g., Ex. 1004 ¶¶ 42–43, Fig. 2), and Zinder's asset storage 604 and ledger storage 606, which stores "[o]ther information" "outside of the blockchain" (*see id.* ¶ 9), teaches at least one electronic parallel storage of a differences layer (*see, e.g.*, *id.* ¶¶ 57–58, Fig. 2). Pet. 29–34. Petitioner shows sufficiently that Zinder teaches linking the blockchain (asserted DCL) to asset storage 604 (asserted PSDL), because asset storage includes, e.g., a unique identifier used to uniquely identify an asset in the blockchain. *Id.* at 32 (citing Ex. 1004 ¶ 57).

Patent Owner contends that Zinder teaches away from limitation 1a, arguing that Zinder "requires duplication of storage at every node" and "collocation of all data items at nodes." Prelim. Resp. 29–30 (referencing subsections 2a and 2b at Prelim. Resp. 24–26, which in turn references Zinder1 through Zinder3 (quoting portions of Ex. 1004 ¶ 43, claim 1, and claim 10, respectively) at Prelim. Resp. 21–22). These arguments do not undermine Petitioner's showing.

First, Patent Owner's arguments are not commensurate with claim scope. Patent Owner does not identify, nor do we discern, claim language that prohibits either duplication of PSDL storage at every node or collocation of all values stored in the PSDL at every node.

Second, we disagree that the asserted PSDL (i.e., Zinder's asset storage and ledger storage) duplicates or collocates all stored values at every node. On the contrary, Zinder teaches storing certain information on the blockchain and "[o]ther information (e.g., that may be confidential in nature) is stored outside of the blockchain." Ex. 1004 ¶ 9. Zinder therefore teaches storing information outside the blockchain. We discern no teaching in Zinder that the information stored outside the blockchain would have been duplicated or collocated at every node. The evidence upon which Patent Owner relies describing storing information at multiple nodes relates to Zinder's blockchain, and not to information stored outside the blockchain. Prelim. Resp. 29–30 (referencing subsections 2a and 2b at Prelim. Resp. 24–26, which in turn references Zinder1, Zinder2, Zinder3 (quoting portions of Ex. 1004 ¶ 43, claim 1, and claim 10, respectively) at Prelim. Resp. 21–22).

2. Limitation 1b

As to limitation 1b, Petitioner argues that the language reciting "accessing and storing a value" through the PSDL requires storing only one of (1) "*time-sequenced electronically published data stream*", or (2) "*descriptive differential*." Pet. 35–36 (emphasis added). As discussed above with regard to claim construction, *supra* Sec. II.B, based upon the preliminary record we treat limitation 1b as reciting a Markush group, and, therefore, storing of only one of the values need be shown to meet the claim.

Although only one of the two claimed values must be accessed and stored through the PSDL, we briefly address the terms "time-sequenced electronically published data stream" and "descriptive differential."

The Specification provides that each PSDL stores at least one "time-sequenced *differential*," wherein "*differentials* are created from . . . electronically published data streams." Ex. 1001, 9:28–32 (emphasis added). Therefore, a "time-sequenced differential" is a time-sequenced value created from an electronically published data stream. It is unclear what distinction, if any, there is between the specification's description of a time-sequenced value that is created from an electronically published data stream and claim 1b's recitation of storing a value of a time-sequenced electronically published data stream (which is nothing more than a time-sequenced differential).

In other words, claim limitation 1b requires accessing and storing one of (1) what essentially is a *time-sequenced* differential, or (2) a *descriptive* differential. This raises the question of the significance of the terms "time-sequenced" and "descriptive," as these terms distinguish the two recited values. At this stage, neither party has provided argument or evidence directed specifically to this issue, and it is not readily apparent from the '797 specification what the term "time-sequenced" means. The '797 patent specification provides examples of "time sequenced exogenous and electronically published data," but the examples appear more directed to assisting the understanding of what is meant by "exogenous and electronically published data," rather than what is meant by "time sequenced." Ex. 1001, 9:55–61. With regard to Figure 3, the '797 patent states diagram 30 "illustrates an example where multiple modular layers of stored (and operative) differences (the PSDLs) are time sequenced." *Id.* at 10:44–46. However, how the term "time sequenced" is being used is not readily assailable. At this stage we need not (as a result of Markush claiming), and therefore we do not, attempt to ascertain, what is meant by "time sequenced" without input from the parties.

As discussed above, it is sufficient for Petitioner to show Zinder teaches that the value accessed and stored through the PSDL is a descriptive differential. Petitioner shows this sufficiently. Specifically, Petitioner shows Zinder teaches ledger 606 storing a descriptive differential, because the ledger stores, e.g., a transaction date, a validation date, etc. Pet. 33–34; Ex. 1004 ¶¶ 58, 87. These values are similar to the values described in the

’797 patent as descriptive differentials: “descriptive differentials . . . can indicate different types, grades, timeframes, or other discriminatory identifiers.” Ex. 1001, 9:35–45 (cited by Pet. 35).

Patent Owner argues Petitioner has not shown Zinder teaches limitation 1b. Prelim. Resp. 30 (referencing subsections 2c and 2d at Prelim. Resp. 26–28, which in turn references Zinder3 through Zinder5 (quoting portions of Ex. 1004, claim 10, Abstract, and ¶ 87, respectively) at Prelim. Resp. 22). Patent Owner’s arguments appear directed toward the “time-sequenced electronically published data stream” recited in limitation 1b. Patent Owner’s arguments relate to the sequence of operations in Zinder for altering blockchain records in response to PSDL differentials. *Id.* at 26–28.

For reasons discussed above, Petitioner need not show Zinder teaches a “time-sequenced electronically published data stream” if Petitioner shows Zinder teaches a “descriptive differential,” which, for reasons discussed above, Petitioner has shown sufficiently.

3. Limitation 1c

For this limitation, Petitioner shows sufficiently that Zinder’s blockchain teaches a DCL as recited, based on Petitioner’s arguments and evidence that limitation 1c essentially recites a conventional DCL (of which blockchain is an example). Pet. 38–40.

Patent Owner contends that Zinder teaches away from limitation 1c, arguing that Zinder “requires duplication of storage at every node” and “collocation of all data items at nodes.” Prelim. Resp. 30 (referencing subsections 2a and 2b at Prelim. Resp. 24–26, which in turn reference Zinder1 through Zinder3 at Prelim. Resp. 21–22). For reasons discussed above regarding limitation 1a, these arguments do not undermine Petitioner's showing.

4. Limitation 1d

For this limitation, Petitioner shows sufficiently that Zinder teaches a PSDL as recited, based on Zinder's teachings relating to asset storage and ledger storage. Pet. 40–43.

Patent Owner contends that Zinder teaches away from limitation 1d, arguing that Zinder requires duplication of storage at every node and collocation of all data items at nodes. Prelim. Resp. 30 (referencing subsections 2a and 2b at Prelim. Resp. 24–26, which in turn reference Zinder1 through Zinder3 (quoting portions of Ex. 1004 ¶ 43, claim 1, and claim 10, respectively) at Prelim. Resp. 21–22). For reasons discussed above regarding limitation 1a, these arguments do not undermine Petitioner's showing.

5. Limitation 1e

For this limitation, Petitioner shows sufficiently that Zinder teaches linking an electronic transaction record in a DCL to at least one electronic PSDL using at least one time sequenced value, string, code, or key, based, e.g., on Zinder's teaching of using, e.g., a blockchain transaction ID for linking, and "other data that corresponds to the transaction." Pet. 43–44 (citing Ex. 1004 ¶¶ 58, 87) (emphasis omitted).

Patent Owner contends that Zinder teaches away from limitation 1e, arguing that Zinder "requires collocating storage of historical data," "collocation of all data items at nodes, "reverses the direction of operations for unrelated purposes," and "Zinder3 time sequencing Z2–Z4 is for recordkeeping only." Prelim. Resp. 31 (referencing subsections 2b, 2d, and 2e at Prelim. Resp. 26–29, which in turn reference Zinder1 through Zinder3 (quoting portions of Ex. 1004 ¶ 43, claim 1, and claim 10, respectively) at Prelim. Resp. 21–22). Arguments relating to subsection 2b are not persuasive for reasons discussed regarding limitation 1a. Arguments relating to subsection 2d and 2e are not commensurate with the scope of claim 1 and are not supported with sufficient evidence. In subsection 2d Patent Owner suggests claim 1 requires "transactional records on the DCL-blockchain are altered in response to processing and storage of differentials," but does not explain, nor do we discern, language in limitation 1d imposing this requirement. *Id.* at 28. Patent Owner further argues that "[i]n the '797 Patent, a change in PSDL differentials changes the DCL, but in Zinder, a change in its additional items necessary is merely recorded because the blockchain transaction has already been submitted." *Id.* (citing Zinder2 through Zinder4 (quoting portions of Ex. 1004, claim 1, claim 10, and Abstract, respectively) at Prelim. Resp. 21–22). Patent Owner does not cite to, or identify, any support in the '797 patent or explain how limitation 1d requires that changes in the PSDL differentials changes the DCL. In addition, Petitioner does not adequately explain how, nor do we discern how, Zinder2 through Zinder4, supports its arguments. Zinder2 and Zinder3 each describe each computing node storing a copy of the blockchain. *Id.* at 21–22 (citing Ex. 1004, claim 1, claim 10). Zinder4 states the disclosed storage system includes a resource and a transaction repository that stores submitted blockchain transactions. *Id.* at 22 (citing Ex. 1004, Abstract). It is not clear how the cited portions of Zinder support Patent Owner's assertions as to how Zinder operates, and Patent Owner does not provide an explanation.

6. *Limitation 1f*

For this limitation, Petitioner shows sufficiently that Zinder teaches imputing a measured differential with a descriptive identifier to the electronic transaction record of the DCL through data storage and processing on a PSDL, based, e.g., on Zinder's teaching of linking asset storage and/or ledger storage to the blockchain. Pet. 45 (citing Ex. 1004 ¶¶ 57, 87).

Patent Owner contends that Zinder "teaches everything in an opposing rationale and solution as detailed in" 2c, 2d, and 2e. Prelim. Resp. 31. For reasons discussed above regarding limitations 1a and 1e, Patent Owner's arguments relating to 2c, 2d, and 2e do not undermine Petitioner's showing.

7. *Conclusion*

Having reviewed and considered the evidence and arguments presented by the parties, based on the present record we determine Petitioner has demonstrated sufficiently, for purposes of institution, that claim 1 would have been unpatentable under § 103. Based on this conclusion, we need not reach the second ground of unpatentability over Zinder, Toll, and Zhang. *See* Pet. 65–76.

III. CONCLUSION

For the reasons expressed above, we determine that Petitioner has demonstrated a reasonable likelihood of showing that at least one claim of the '797 patent is unpatentable. As set forth in the Order below, we institute a trial on all challenged claims and all asserted grounds of unpatentability.

See 37 C.F.R. § 42.108(a) ("When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.").

Our factual findings and determinations at this stage of the proceeding are preliminary, and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Our final decision will be based on the record as fully developed during trial.

IV. ORDER

Accordingly, it is

ORDERED that an *inter partes* review is instituted as to all challenged claims on all the grounds raised in the Petition; and

FURTHER ORDERED that *inter partes* review is instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

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