

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

JENAM TECH, LLC,
Patent Owner

Patent No. 11,050,856

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,050,856**

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	MANDATORY NOTICES UNDER 37 C.F.R. § 42.8.....	1
A.	Real Parties-in-Interest.....	1
B.	Related Matters.....	1
1.	Related Lawsuit.....	1
2.	Related Applications	2
3.	Related IPRs.....	5
C.	Counsel and Service Information.....	7
III.	PAYMENT OF FEES UNDER 37 C.F.R. § 42.15(a)	7
IV.	GROUND FOR STANDING.....	7
V.	PRECISE RELIEF REQUESTED AND GROUNDS RAISED.....	7
A.	Claim for Which Review Is Requested.....	7
B.	Statutory Grounds of Challenge.....	8
VI.	OVERVIEW OF THE '856 PATENT	9
VII.	LEVEL OF ORDINARY SKILL IN THE ART.....	10
VIII.	CLAIM CONSTRUCTION	10
IX.	DETAILED EXPLANATION OF GROUNDS.....	11
A.	Ground 1: The Combination of Morris and SIP Render Obvious Claims 40, 41, 42, 48, 49, and 54.....	11
1.	Claim 40	11
2.	Claim 41	52
3.	Claim 42	52

4.	Claim 48	54
5.	Claim 49	56
6.	Claim 54	60
X.	EARLIEST EFFECTIVE FILING DATE OF '856 PATENT	60
A.	The '856 Patent and Its Priority Applications Do Not Provide Written Description Support For the “First Packet . . . for Use in a Protocol: That Is Not TCP, and That Is Not a TCP Extension”	62
1.	The '554 Application and Its Priority Applications Are Limited to TCP-Based Embodiments	63
2.	Materials Incorporated by Reference in the Priority Applications Do Not Support the Non-TCP Features	69
3.	Mere Introduction of Non-TCP Type Terms In Summaries and Claims of Some Priority Applications Does Not Support the Non-TCP Features.....	70
4.	Dependent Claims 41, 42, 48, 49, and 54 Are Not Supported	76
B.	The '856 Patent and Its Priority Applications Do Not Provide Written Description Support For Detecting a Time Period During At Least A Portion of the First Connection Setup (All Challenged Claims)	76
1.	The '554 and '824 Applications Do Not Support the Time Period Detection During Connection Setup Features of Claim 40	78
2.	The Priority Applications Do Not Support the Time Period Detection During Connection Setup Features of Claim 40	82
3.	Dependent Claims 41, 42, 48, 49, and 54 Are Not Supported	82

C.	Both The Non-TCP Features and The Detecting a Time Period During At Least A Portion of the Connection Setup Features Must Be Supported For Priority	82
XI.	SIP IS A PRINTED PUBLICATION	83
XII.	THE RELATED LITIGATION PROVIDES NO BASIS FOR DISCRETIONARY DENIAL	84
XIII.	CONCLUSION.....	87

LIST OF EXHIBITS

EX1001	U.S. Patent No. 11,050,856
EX1002	Declaration of Bill Lin, Ph.D.
EX1003	Curriculum Vitae of Bill Lin, Ph.D.
EX1004	File History of U.S. Patent Application No. 17/184,554 (U.S. Patent No. 11,050,856)
EX1005	U.S. Publication No. 2011/0213820 to Morris
EX1006	IETF RFC 3261 “SIP: Session Initial Protocol”
EX1007	U.S. Patent No. 6,981,048 to Abdolbaghian
EX1008	DARPA RFC 793 “Transmission Control Protocol”
EX1009	IETF RFC 1122 “Requirements for Internet Hosts -- Communication Layers”
EX1010	U.S. Patent No. 9,923,995
EX1011	IETF RFC 1001 “Protocol Standard for a NetBIOS Service On A TCP/UDP Transport: Concepts and Methods”
EX1012	U.S. Patent No. 6,212,175 to Harsch
EX1013	U.S. Patent No. 6,665,727 to Hayden
EX1014	U.S. Patent No. 7,636,805 to Rosenberg
EX1015	IETF RFC 5440 “Path Computation Element (PCE) Communication Protocol (PCEP)”
EX1016	The Xpress Transfer Protocol (XTP): A tutorial (short version), Sanders et al. (January, 1990)
EX1017	<i>Jenam Tech, LLC’s Infringement Contentions</i> regarding U.S. Patent No. 10,951,742 (July 2, 2021)

Petition for *Inter Partes* Review
Patent No. 11,050,856

EX1018	L. Eggert, TCP Abort Timeout Option, draft-eggert-tcm-tcp-abort-timeout-option-00, Network Working Group, Internet-Draft (April 14, 2004) (“ <i>Eggert</i> ”)
EX1019	U.S. Publication No. 2007/0110046 to Farrell <i>et al.</i>
EX1020	U.S. Pre-Grant Publication No. 2004/0093376 to De Boor <i>et al.</i>
EX1021	U.S. Patent 7,535,913 to Minami <i>et al.</i>
EX1022	U.S. Pre-Grant Publication No. 2005/0204013 to Raghunath <i>et al.</i>
EX1023	U.S. Pre-Grant Publication No. 2007/0005804 to Rideout
EX1024	U.S. Pre-Grant Publication No. 2004/0098748 to Bo <i>et al.</i>
EX1025	IETF RFC 2616 “Hypertext Transfer Protocol -- HTTP/1.1”
EX1026	U.S. Patent No. 8,259,716 to Diab
EX1027	Bova <i>et al.</i> , RELIABLE UDP PROTOCOL <draft-ietf-sigtran-reliable-udp-00.txt> 25 February 1999
EX1028	U.S. Patent No. 6,674,713 to Berg <i>et al.</i>
EX1029	Deposition Transcript of Patent Owner’s Declarant, Dr. Michael Smith, in IPR2020-00845 (April 30, 2021)
EX1030	<i>Jenam Tech, LLC v. Google LLC</i> , Case No. 4:21-cv-07994-JST, Order Granting Motion to Stay (March 28, 2022)
EX1031	<i>Jenam Tech, LLC v. Google LLC</i> , Case Nos. 4:22-cv-02836-JST, 4:22-cv-02837-JST, 4:22-cv-02838-JST, 4:22-cv-02839-JST, Stipulation and Order regarding Claim Narrowing and Stay (October 12, 2022)

Petition for *Inter Partes* Review
Patent No. 11,050,856

EX1032	Exhibit B to Complaint in in <i>Jenam Tech, LLC v. Google LLC</i> , Case No. 4:22-cv-02839 (May 13, 2022), <i>Jenam Tech, LLC’s</i> Infringement Claim Chart for U.S. Patent No. 11,050,856
EX1033	<i>Jenam Tech, LLC v. Google LLC</i> , Case Nos. 4:22-cv-02836-JST, 4:22-cv-02837-JST, 4:22-cv-02838-JST, 4:22-cv-02839-JST, Order Denying Motion to Stay (September 26, 2022)
EX1034	U.S. Publication No. 2010/0202366 to Tseng
EX1035	IETF RFC 2119 “Key words for use in RFCs to Indicate Requirement Levels”
EX1036	U.S. Patent No. 10,306,026
EX1037	U.S. Patent No. 10,742,774
EX1038	File History of U.S. Patent Application No. 12/714,454 (U.S. Patent No. 8,219,606)
EX1039	File History of U.S. Patent Application No. 13/477,402
EX1040	Computer-generated Redline Between U.S. Patent Application No. 12/714,454 and U.S. Patent Application No. 13/477,402
EX1041	File History of U.S. Patent Application No. 12/714,063
EX1042	Computer-generated Redline Between U.S. Patent Application No. 12/714,454 and U.S. Patent Application No. 12/714,063
EX1043	File History of U.S. Patent Application No. 14/667,642
EX1044	File History of U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995)
EX1045	File History of U.S. Patent Application No. 15/915,047 (U.S. Patent No. 10,075,564)

Petition for *Inter Partes* Review
Patent No. 11,050,856

EX1046	File History of U.S. Patent Application No. 16/040,522 (U.S. Patent No. 10,375,215)
EX1047	File History of U.S. Patent Application No. 16/368,811 (U.S. Patent No. 10,742,774)
EX1048	File History of U.S. Patent Application No. 16/914,267
EX1049	Computer-generated Redline Between U.S. Patent Application No. 13/477,402 and U.S. Patent Application No. 14/667,642
EX1050	Computer-generated Redline Between U.S. Patent Application No. 12/714,454 and U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995)
EX1051	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 15/915,047 (U.S. Patent No. 10,075,564)
EX1052	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 16/040,522 (U.S. Patent No. 10,375,215)
EX1053	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 16/368,811 (U.S. Patent No. 10,742,774)
EX1054	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 16/914,267
EX1055	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 17/079,397 (U.S. Patent No. 10,951,742)

EX1056	IETF RFC 3168 “The Addition of Explicit Congestion Notification (ECN) to IP”
EX1057	IETF RFC 6093 “On the Implementation of the TCP Urgent Mechanism”
EX1058	IETF RFC 6528 “Defending against Sequence Number Attacks”
EX1059	Excerpt of IETF webpage hosting RFC 793, retrieved May 2, 2021
EX1060	RFC 768 USER DATAGRAM PROTOCOL
EX1061	DARPA RFC 792 INTERNET CONTROL MESSAGE PROTOCOL
EX1062	File History of U.S. Provisional Patent Application No. 62/137,173
EX1063	File History of U.S. Patent Application No. 14/294,059
EX1064	File History of U.S. Patent Application No. 12/857,851
EX1065	File History of U.S. Patent Application No. 13/941,502
EX1066	File History of U.S. Patent Application No. 12/789,550
EX1067	File History of U.S. Patent Application No. 12/857,847
EX1068	File History of U.S. Patent Application No. 12/857,857
EX1069	File History of U.S. Patent Application No. 12/857,836
EX1070	File History of U.S. Patent Application No. 12/788,364 (U.S. Patent No. 8,346,853)
EX1071	File History of U.S. Patent Application No. 12/788,373
EX1072	File History of U.S. Patent Application No. 12/789,538
EX1073	File History of U.S. Patent Application No. 12/788,381

Petition for *Inter Partes* Review
Patent No. 11,050,856

EX1074	File History of U.S. Patent Application No. 12/789,568
EX1075	File History of U.S. Patent Application No. 17/148,824 (U.S. Patent No. 10,986,217)
EX1076	File History of U.S. Patent Application No. 17/079,397 (U.S. Patent No. 10,751,742)
EX1077	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 17/148,824 (U.S. Patent No. 10,986,217)
EX1078	Computer-generated Redline Between U.S. Patent Application No. 15/694,802 (U.S. Patent No. 9,923,995) and U.S. Patent Application No. 17/184,554 (U.S. Patent No. 11,050,856)
EX1079	<i>Google LLC v. Jenam Tech, LLC</i> , PGR202-00013, Paper 9 (Decision on Institution regarding U.S. Patent No. 10,951,742) (March 23, 2022)
EX1080	<i>Google LLC v. Jenam Tech, LLC</i> , PGR202-00013, Paper 1 (Petition for Post Grant Review of U.S. Patent No. 10,951,742) (December 15, 2021)
EX1081	Declaration of Sandy Ginoza for IETF regarding RFC 3261: SIP (Session Initiation Protocol)
EX1082	Introduction to the IETF (https://www.ietf.org/about/introduction/) (retrieved April 19, 2023)
EX1083	U.S. Pre-Grant Publication No. 2005/0255870 to Chang et al.
EX1084	International Publication No. WO 2019/125260 to Stille et al.
EX1085	U.S. Patent No. 6,810,263 to Cheng et al.

Petition for *Inter Partes* Review
Patent No. 11,050,856

EX1086	U.S. Pre-Grant Publication No. 2006/0191003 to Bahk et al.
EX1087	U.S. Patent No. 10,951,742
EX1088	<i>Jenam Tech, LLC's Second Amended Set of Infringement Contentions</i> regarding U.S. Patent No. 10,742,774 (March 17, 2021)
EX1089	<i>Jenam Tech, LLC's Second Amended Set of Infringement Contentions</i> regarding U.S. Patent No. 10,306,026 (March 17, 2021)
EX1090	IETF RFC 1323 "TCP Extensions for High Performance"
EX1091	IETF RFC 2001 "TCP Slow Start, Congestion Avoidance, Fast Retransmit, and Fast Recovery Algorithms"
EX1092	Jacobson, "Congestion Avoidance and Control," Communications Architectures & Protocols, Computer Communications Review, Volume 18, Number 4 (August 1988)

I. INTRODUCTION

Google LLC (“Petitioner”) requests *inter partes* review (“IPR”) of claims 40, 41, 42, 48, 49, and 54 (“the challenged claims”) of U.S. Patent No. 11,050,856 (“the ’856 patent”) (EX1001) assigned to Jenam Tech, LLC (“Patent Owner” or “PO”). For the reasons below, the challenged claims should be found unpatentable and canceled.

II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

A. Real Parties-in-Interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner identifies the following as the real parties-in-interest: Google LLC.¹

B. Related Matters

1. Related Lawsuit

The ’856 patent is asserted in the following civil action: *Jenam Tech, LLC v. Google, LLC*, Case No. 4:22-cv-02839-JST (N.D. Cal.) (“839 action”). The 839 action has been related to another district court action captioned *Jenam Tech, LLC*

¹ Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

v. Google, LLC, Case No. 4:21-cv-07994-JST (N.D. Cal.) (“994 action”) involving related patents. *See* Related Case Order (Dkt. No. 10) in 839 action.

The following additional civil actions, involving additional related patents, have also been related to the 994 action: *Jenam Tech, LLC v. Google, LLC*, Case Nos. 4:22-cv-02836, -02837, -02838 (N.D. Cal.). *See* Related Case Order (Dkt. No. 10) in 839 action.

2. Related Applications

The ’856 patent relates to several patents and/or patent applications, as shown in the purported priority chain below:

Petition for *Inter Partes* Review
Patent No. 11,050,856



**Subject to this
IPR Petition**



As shown above, U.S. patent application no. 17/184,554 (“the ’554 application”) issued as the ’856 patent. (*See also* EX1001, cover (Related U.S. application data section), 1:8-57.) The ’554 application is a continuation of U.S. patent application no. 17/148,824, which issued as U.S. Patent No. 10,986,217 (“the ’217 patent”). The ’824 application is a continuation of U.S. patent application no. 16/914,267 (“the ’267 application”). The ’267 application is a continuation of U.S. patent application no. 16/368,811 (“the ’811 application”), which issued as U.S. Patent No. 10,742,774 (“the ’774 patent”). The ’811 application is a continuation of U.S. patent application no. 16/040,522 (“the ’522 application”), which issued as U.S. Patent No. 10,375,215 (“the ’215 patent”). The ’522 application is a continuation of U.S. patent application no. 15/915,047 (“the ’047 application”), which issued as U.S. Pat. No. 10,075,564 (“the ’564 patent”). The ’047 application is a continuation of U.S. patent application no. 15/694,802 (“the ’802 application”), which issued as U.S. Pat. No. 9,923,995 (“the ’995 patent”). The ’802 application is a continuation-in-part of U.S. patent application no. 14/667,642 (“the ’642 application”). The ’642 application is a continuation-in-part of U.S. patent application no. 13/477,402 (“the ’402 application”). The ’402 application is a continuation of U.S. patent application no. 12/714,454 (“the ’454 application”), which issued as U.S. Patent No. 8,219,606 (“the ’606 patent”).

The '554 application is related to U.S. application no. 12/714,063 (“the '063 application”), filed February 26, 2010. (EX1001, 1:64-2:2.)

3. Related IPRs

The following IPR and PGR petitions have been filed challenging patents related to the '856 patent (these additional patents are also at issue in the related 994 action):

- IPR2020-00845 (challenging claims of the '995 patent) (Final Written Decision issued with all challenged claims canceled; Final Written Decision affirmed on appeal); *see Jenam Tech, LLC v. Google LLC*, No. 2022-1085, slip op. at 2 (Fed. Cir. Apr. 11, 2023);
- IPR2020-00742 (challenging claims of the '995 patent) (“Unified -742 IPR”) (Terminated);
- IPR2021-00627 (challenging claims of the '215 patent) (Final Written Decision issued with all challenged claims canceled; Final Written Decision on appeal);
- IPR2021-00628 (challenging claims of the '564 patent) (Final Written Decision issued with all challenged claims canceled or disclaimed pre-institution; Final Written Decision on appeal);

- IPR2021-00629 (challenging claims of the '564 patent) (Judgment Granting Request for Adverse Judgment issued after all challenged claims disclaimed post-institution);
- IPR2021-00630 (challenging claims of U.S. Patent No. 10,075,565, “the '565 patent”) (Final Written Decision issued with all challenged claims canceled or disclaimed pre-institution; Final Written Decision on appeal);
- IPR2021-00867 (challenging claims of U.S. Patent No. 10,306,026, “the '026 patent”) (Final Written Decision issued with all challenged claims canceled; Final Written Decision on appeal);
- IPR2021-00868 (challenging claims of the '026 patent) (Final Written Decision issued with all challenged claims canceled or disclaimed pre-institution; Final Written Decision on appeal);
- IPR2021-00869 (challenging claims of U.S. Patent No. 10,069,945, “the '945 patent”) (Final Written Decision issued with all challenged claims canceled; Final Written Decision on appeal);
- IPR2021-00870 (challenging claims of the '945 patent) (Final Written Decision issued with all challenged claims canceled; Final Written Decision on appeal);
- PGR2021-00082 (challenging claims of the '774 patent) (challenged claim disclaimed by PO and institution denied in view of disclaimer);

- PGR2022-00013 (challenging claims of U.S. Patent No. 10,951,742, “the ’742 patent”) (challenged claims disclaimed by PO and institution denied in view of disclaimer); and
- Petitioner is concurrently filing an IPR petition challenging other claims of the ’856 patent.

C. Counsel and Service Information

Lead counsel: Naveen Modi (Reg. No. 46,224). Backup counsel: (1) Joseph E. Palys (Reg. No. 46,508), (2) Quadeer Ahmed (Reg. No. 60,835), Alexa J. Lowman (*pro hac vice* to be filed).

Service information is Paul Hastings LLP, 2050 M Street NW, Washington, DC 20036, Tel.: 202.551.1700, Fax: 202.551.1705, email: PH-Google-Jenam-IPR@paulhastings.com. Petitioner consents to electronic service.

III. PAYMENT OF FEES UNDER 37 C.F.R. § 42.15(a)

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. 50-2613.

IV. GROUNDS FOR STANDING

Petitioner certifies that the ’856 patent is available for review, and Petitioner is not barred/estopped from requesting review on the grounds herein.

V. PRECISE RELIEF REQUESTED AND GROUNDS RAISED

A. Claim for Which Review Is Requested

Petitioner respectfully requests review of claims 40, 41, 42, 48, 49, and 54 (“the challenged claims”) of the ’856 patent, and cancellation of these claims as unpatentable.

B. Statutory Grounds of Challenge

The challenged claims should be canceled as unpatentable on the following grounds:

Ground 1: Claims 40, 41, 42, 48, 49, and 54 are unpatentable under AIA 35 U.S.C. § 103 over U.S. Publication No. 2011/0213820 to Morris (“Morris”) (EX1005) in view of IETF RFC 3261 “SIP: Session Initial Protocol” (“SIP”) (EX1006).²

The ’856 patent issued from an application filed February 24, 2021, which claims priority through a number of applications back to an application filed February 27, 2010. (EX1001, 1:8-57.) The challenged claims of the ’856 patent are not entitled to an effective filing date prior to February 24, 2021. (*See infra* Section X.)

² Other references discussed herein are provided to show the state of the art at the time of the alleged invention of the ’856 patent.

Morris published on September 1, 2011 and was filed February 27, 2010. SIP was published and publically available as early as July 2002. (*See infra* Section XI.) Thus, both Morris and SIP qualify as prior art at least under 35 U.S.C. § 102(a)(1).

VI. OVERVIEW OF THE '856 PATENT

The '856 patent is directed to networking and the sharing of information for detecting an idle TCP connection. (EX1001, 2:57-59, 5:60-6:2.) Figure 7 illustrates such a process.

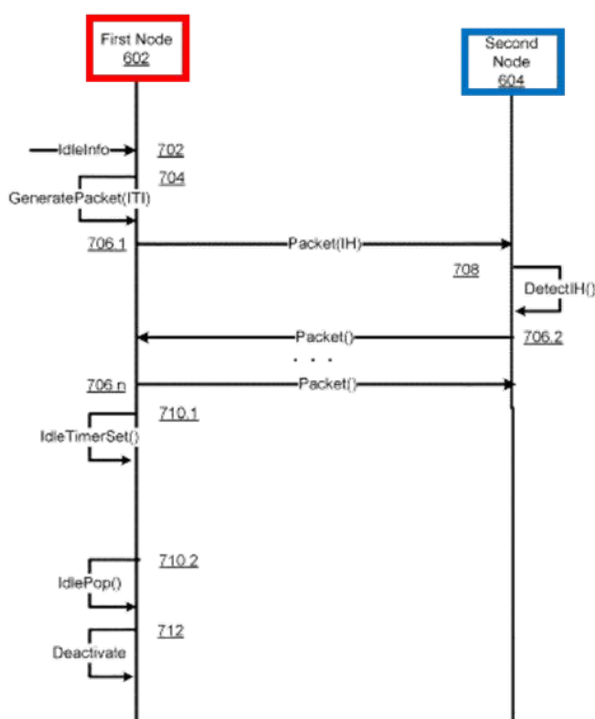


Fig. 7

(*Id.*, FIG. 7 (annotated); EX1002 ¶66.)

As discussed below, the challenged claims are not entitled to priority and are obvious over the prior art. (*See infra* Sections IX-X; EX1002 ¶¶76-201; *see also id.* ¶¶20-64 (discussing technology background), citing, e.g., EXS. 1007-1009, 1011-1015, 1020-1028.)

VII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art at the time of the alleged invention of the '856 patent ("POSITA") would have had an undergraduate degree in electrical engineering, computer engineering, computer science or a related field along with at least two years of work experience in the field of networking. (EX1002 ¶¶16-17.)³ More education can supplement practical experience and vice versa. (*Id.*)

VIII. CLAIM CONSTRUCTION

Under the applicable standard in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), claim terms are typically given their ordinary and customary meanings as understood by a POSITA at the time of the invention based on the claim language, specification, and the prosecution history of record. *Phillips*, 415 F.3d at 1313; *see also id.* at 1312–16. The Board, however, only construes the claims when

³ Petitioner submits the declaration of Dr. Bill Lin (EX1002), an expert in the field of the '856 patent. (EX1002 ¶¶3-11; EX1003.)

necessary to resolve the controversy. *Toyota Motor Corp. v. Cellport Sys., Inc.*, IPR2015-00633, Paper No. 11 at 16 (Aug. 14, 2015) (citation omitted). Petitioner submits that, for purposes of this proceeding, no term requires construction.⁴

IX. DETAILED EXPLANATION OF GROUNDS

A. Ground 1: The Combination of Morris and SIP Render Obvious Claims 40, 41, 42, 48, 49, and 54

1. Claim 40

To assist the Board in navigating the mapping of the prior art to the arguably confusing claim language of claim 40, Petitioner initially notes that Morris discloses and/or suggests the features recited elements 40.a-b, 40.e(1), 40.f(1), 40.f(3)-(4), and 40.h, which, *inter alia*, include features relating to a “second duration” for detecting a second time period (of a first type) in a first connection between an apparatus and a node, after the first connection is set up. The “second duration” is specified by metadata included in a first packet that is sent from the apparatus to the node to set up the first connection, as recited in element 40.f. As explained below with respect

⁴ Petitioner reserves all rights to raise claim construction and other arguments in district court as relevant to those proceedings. A comparison of the claims to any accused products in litigation may raise controversies that are not presented here given the similarities between the references and the patent.

to claim elements 40.a-b, 40.e(1), 40.f(1), 40.f(3)-(4), and 40.h, these elements relate to features that largely track the processes (and components to perform them) discussed by Morris (which is a pre-grant publication of the '454 application, from which the '856 patent claims priority). (See *e.g.*, Ex. 1005, FIGS. 2, 7 (below), ¶¶[0035], [0052], [0073], [0083], [0088], [0106]; see also Sections II.B.2, X.)

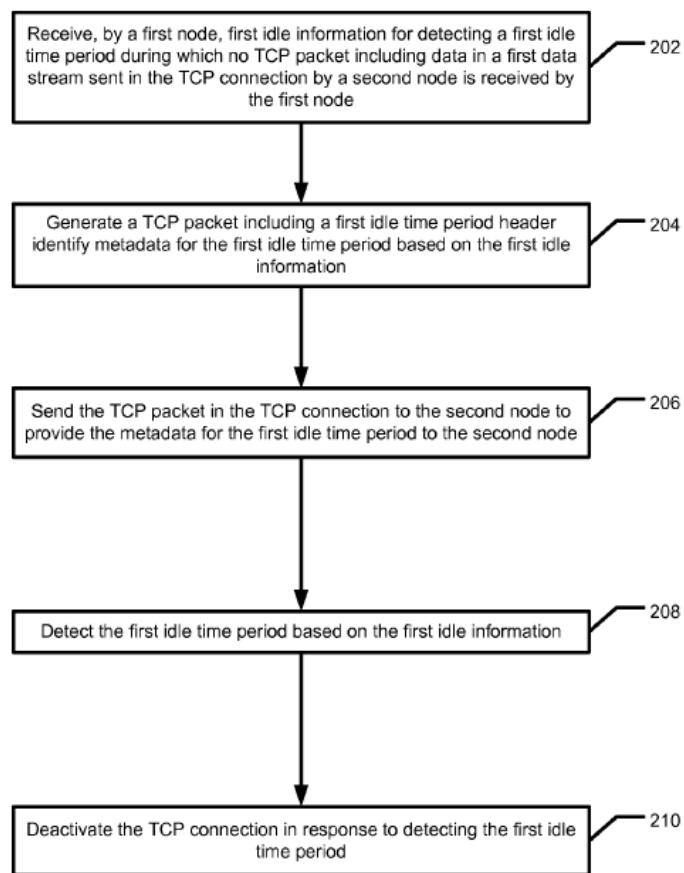


Fig. 2

(EX1005, FIG. 2.)

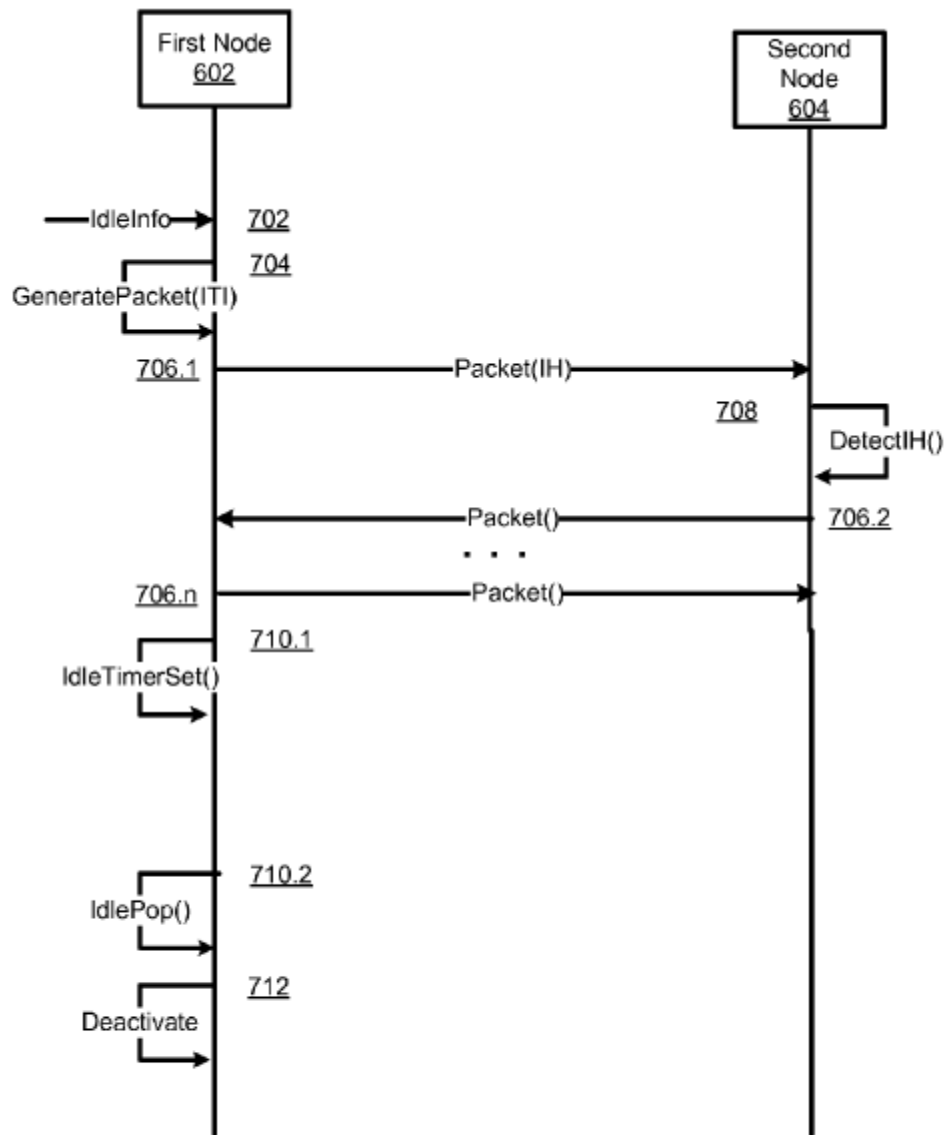


Fig. 7

(EX1005, FIG. 7.)

Morris, however, does not expressly disclose every feature recited in claim elements 40.d, 40.e(2)-(3), 40.f(2), and 40.g, which relate, *inter alia*, to a “first

duration” for detecting a first time period (also of the first type) **during** at least a **portion of the first connection setup** and require that a first packet used to setup the first connection is for use in a **protocol that is not a transmission control protocol (TCP)**. (See *infra* §§IX.A.1.d, IX.A.1.e(2)-(3), IX.A.1.f(2), IX.A.1.g.) But, as demonstrated below, a POSITA would have found it obvious to modify the processes/system of Morris to provide features consistent with those recited in elements 40.d, 40.e(2)-(3), 40.f(2), and 40.g in light of the teachings/suggestions of SIP, in context of a POSITA’s knowledge at the time.

a) A method, comprising:

Morris discloses this limitation. (EX1002 ¶84.) For example, Morris is directed to “[m]ethods and systems ... for sharing information for detecting an idle TCP [transmission control protocol] connection.” (EX1005, ¶[0008]; *see also id.*, ¶¶[0005], [0006], [0009]-[0011].)

b) at an apparatus:

Morris discloses this limitation. (EX1002 ¶¶85-86.) Morris discloses a hardware device 100 (“apparatus”) in Figure 1, exemplified by first node 602 or second node 604 in Figures 6-7, for carrying out its disclosed method(s). (EX1005,

¶¶[0021]-[0023], [0040], [0126]-[0127], claims 11, 22; FIGS. 1, 6-7; *see also* EX1002 ¶¶76-78 (Morris overview).⁵

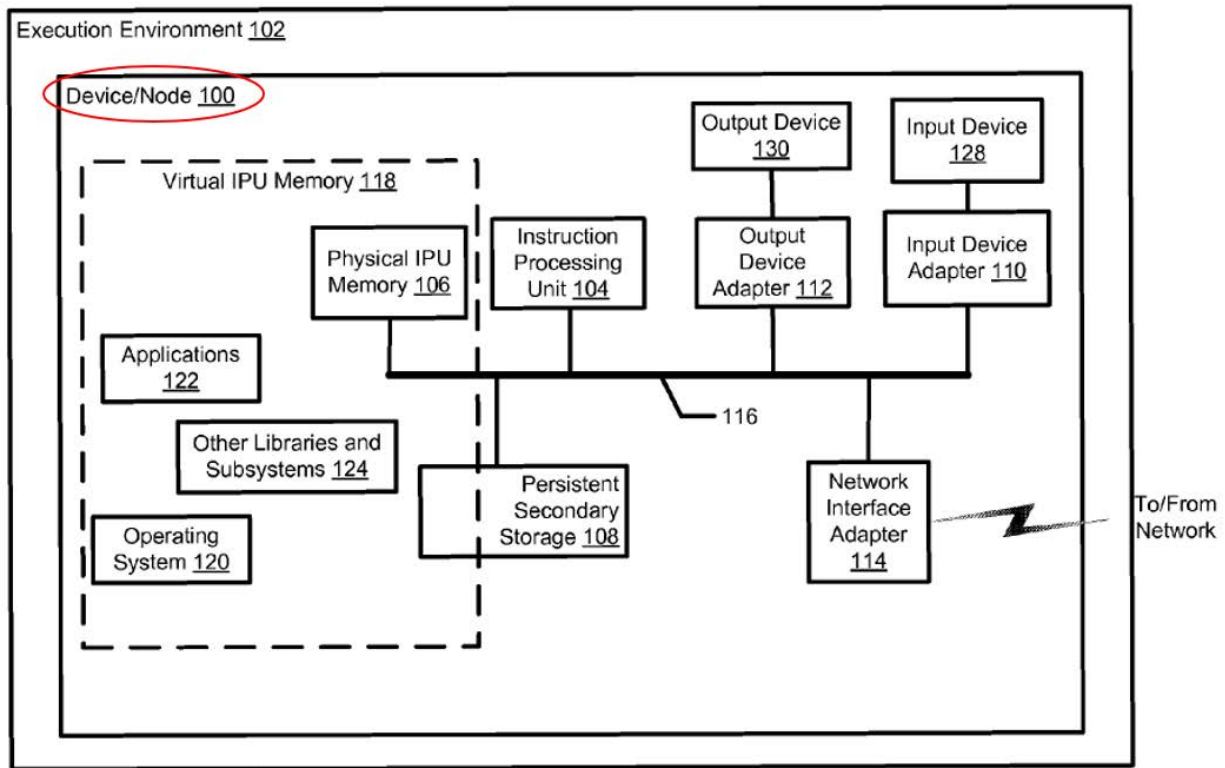


Fig. 1

(EX1005, FIG. 1 (annotated).)⁶

⁵ For purposes of its analysis, Petitioner maps the first node 602 in Morris to the ‘apparatus’ and the second node 604 to the ‘node’ recited in claim element 40.f. (See also EX1005, FIGS. 2-3 (referencing ‘first node’ and ‘second node’ to similarly refer to first node 602 and second node 604, respectively).)

⁶ Morris also refers to the device 100 as node 100, as shown in Figure 1.

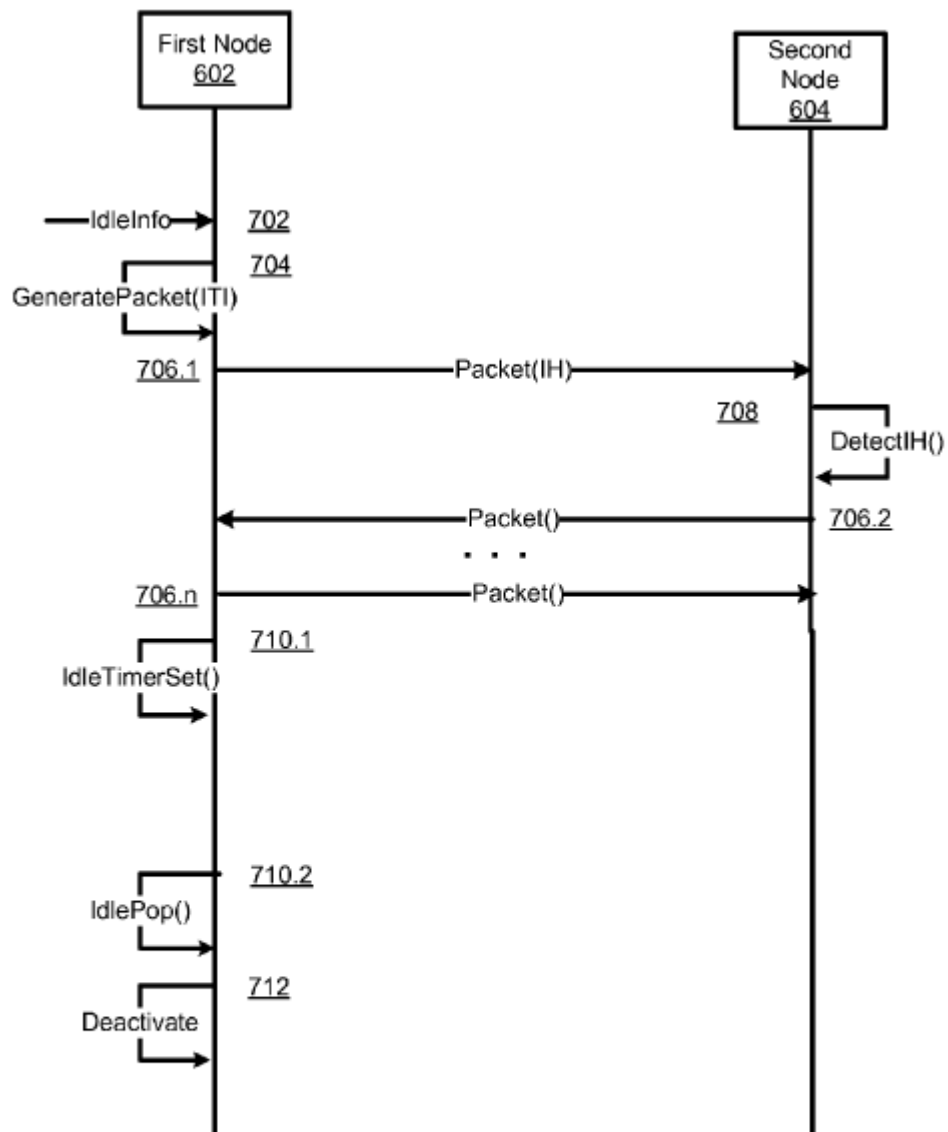


Fig. 7

(EX1005, FIG. 7.)

- c) ⁷
- d) **receiving first information on which at least a first duration for detecting a first type of time period is based, where the first type of time period does not include a user timeout period of transmission control protocol (TCP);**

Morris in combination with SIP discloses or suggests this limitation. (EX1002, ¶¶87-113.) As noted at the outset of §IX, during connection setup when the metadata for the “second duration” is being sent by the apparatus to the node, the “first duration” recited in claim elements 40.d and 40.g is used to detect a first time period (of a first type). (See claim elements 40.d and 40.g.) After the connection setup, the second duration is used to detect a second time period (also of the first type). (See claim elements 40.e, 40.f, and 40.h.)

Morris is directed to sharing metadata regarding idle time information (e.g., for the second duration) during connection setup and then, after the connection is set up, using the idle time information to detect a time period (e.g., a timeout) that subjects the connection to deactivation. (See *infra* Sections IX.A.1.e-f, IX.A.1.h.) Morris does not disclose detecting such a time period based on the claimed first duration during the connection setup itself. (EX1002, ¶89; see *infra* Section X.A.2.)

⁷ In the interest of aligning the cross-cites between the instant petition and a concurrently filed petition for the '856 patent, Petitioner leaves IX.A.1.c blank.

However, it would have been obvious to a POSITA to consider and implement detection of a time period using the first duration during the connection setup, based on the teachings of SIP (EX1006) and the knowledge of a POSITA.

SIP, like Morris, is directed to a protocol in the networking field for enabling communication between two nodes. For example, SIP discloses the Session Initiation Protocol, which is an application-layer protocol for creating, modifying, and terminating sessions (between nodes) such as telephone calls, multimedia distribution, or multimedia conferences. (EX1006, Abstract, 8; *see also* EX1002 ¶¶90-91 (SIP overview).) Like Morris, SIP discloses that it enables Internet endpoints to agree on a characterization of a session (EX1006, 8-9) including “negotiation of session parameters to establish the session” (EX1006, 10-11; *see also* EX1005, ¶¶[0005], [0008]-[0011].)

Both SIP and Morris also disclose respective three-way handshake procedures to establish communication between nodes. (EX1006, 16 (describing “the INVITE/200/ACK three-way handshake used to establish SIP sessions”), 125; EX1005 ¶[0076].) Thus, SIP discloses networking features in the same technical field as Morris including negotiation of communication parameters and so a POSITA would have had reason to consider the teachings of SIP when implementing Morris. (EX1002, ¶¶92-97.)

As part of its protocol, SIP discloses an INVITE Client Transaction (ICT). (EX1006, 125-129 (section 17.1.1).) SIP discloses that this ICT involves setting up the session using a three-way handshake where the client transaction sends an INVITE, the server transaction sends responses, and the client transaction sends an acknowledgment (ACK). (EX1006, 125; *see also id.*, 10-16.) Figure 5 shows the state machine for the ICT. (EX1006, 125.)

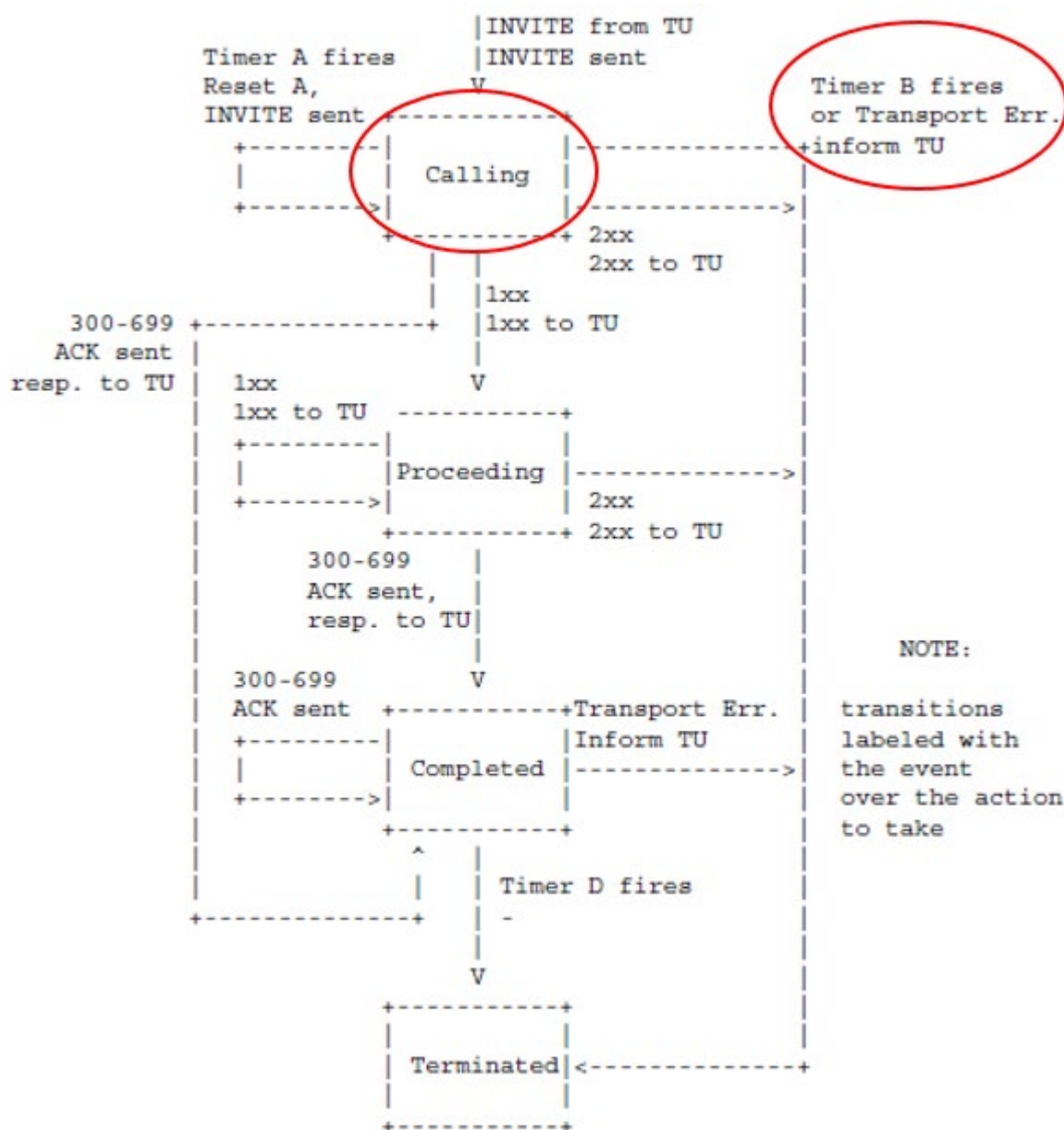


Figure 5: INVITE client transaction

(EX1006, 128 (FIG. 5 (annotated)).)

As shown, the ICT includes an initial “calling” state that a transaction user (TU) enters when the TU initiates a new transaction by sending an INVITE request (i.e., begin the handshake procedure). (EX1006, 125.) Upon the sending of the

INVITE request, the client transaction instance for the TU starts timer B which controls transaction timeouts and optional timer A (which controls retransmissions). (*Id.*)⁸ Timer A is set to a value of T1, and timer B is set to a value of “64*T1 seconds,” where “T1 is an estimate of the round-trip time (RTT)” between the client and server. (*Id.*, 125-126) The value of timer B allows for a certain number of retransmissions (e.g., seven) in case an unreliable transport protocol like UDP is used. (*Id.*, 126.)

When no response message to the INVITE request is received by the requesting TU for the duration of timer B such that the response message would have caused the calling state to advance to a subsequent state like a “proceeding” state or a “completion” state, timer B expires. (EX1006, 126, FIG. 5.) Upon expiration of timer B, the client transaction informs the TU that a timeout has occurred and

⁸ Depending upon the implementation of the transport layer, timer A (which controls retransmissions of the INVITE message) is also started. (EX1006, 125-126.) For example, when the transport layer is implemented using an unreliable transport protocol like UDP, timer A must be started. (*Id.*) Timer A is not required for a transport layer implemented using a reliable transport protocol like TCP. (*Id.*; see also *id.*, 10; EX1035, 1.)

proceeds to the “terminated” state. (*Id.*) The client transaction is destroyed “the instant it enters the ‘Terminated’ state.” (*Id.*, 128.)

As such, SIP discloses a mechanism to detect a timeout during the setup of a communication between two nodes using timer B, and closing the communication upon the timeout detection. A POSITA would have been motivated to consider and draw from such teachings of SIP when implementing Morris. (EX1002, ¶95.)

For example, Morris discloses negotiating the value of an idle time period (ITP) during connection setup and modifying timeout attributes for the established connection based on the negotiated ITP to detect timeouts. (*See, e.g.*, EX1005, FIGS. 1-7, ¶¶[0035]-[0040], [0069], [0082]-[0083].) Morris does not disclose detecting any timeouts during connection setup. However, Morris is concerned with wasting network bandwidth and resources by unnecessarily keeping communication between two nodes open due to idleness or underactivity or a connectivity problem (e.g., dead connection). (EX1005, ¶¶[0003]-[0005].) Thus, a POSITA would have been motivated to draw from the teachings of SIP, which discloses detecting a timeout when no response to an initial setup message is received and terminating the communication between the nodes. (EX1002, ¶96.)

In light of SIP’s teachings a POSITA would have been motivated to configure Morris’ apparatus, such that it receives a value (“first information”) on which at least preliminary ITP information (“first duration for detecting a first type of time period”)

is based. (EX1002, ¶97.) As Morris explains, the ITP information may be received from various sources including an IPU memory and/or secondary storage where such information is stored or via an application protocol layer, sockets component and/or directly from a network application. (EX1005, [0055]-[0059]; *see also id.*, [0050]-[0054], claims 11, 20, 22.) Like SIP, a POSITA would have considered configuring Morris' apparatus such that the received value for the preliminary ITP information is based on a round-trip time between the communicating nodes (e.g., first/second nodes 602/604 in Figure 7) like the value $64 \cdot T1$ on which the timer B is based in SIP. (*Id.*; EX1006, 125-126.) Alternatively, a POSITA would have considered configuring Morris' apparatus such that the received value for the first duration is based on a timeout parameter from a prior connection or connection attempt between the nodes. (EX1002, ¶97; EX1083, Abstract, [0013], [0026], [0034], [0039]; EX1084, 7:5-17, 6:33-7:3; EX1085, 2:1-17, 2:33-44, 5:15-29, 6:37-57, claims 1, 22).)

In either case, a POSITA would have considered a value for the preliminary ITP information which would have allowed for a certain number of retransmissions of the initial setup packet in case the initial transmission was not successful. (EX1002, ¶99; EX1006, 126; EX1008, 45 (describing retransmission timeout in the context of an established TCP connection); EX1086, [0064] (describing a TCP implementation with a connection setup timer that allows for three retransmissions

of the initial setup packet before the timer expires).) Each of these would further motivate a POSITA to add the ability of detecting a timeout based on the preliminary ITP information when no response to an initial setup message is received and terminating the communication between the nodes to the disclosures of Morris. (EX1002, ¶100.)

For example, with respect to the alternate approach related to using a parameter from a prior connection, Morris teaches that ITP information negotiated during the connection setup and used, e.g., to set a timeout for the established connection may be based on information in an ITP header in a previously received packet in the same connection. (EX1005, [0058], [0094], claims 7, 12; *see also id.*, [0095] (disclosing the ITP may be dynamic).) Based on these teachings, it would have been obvious to further configure Morris such that an ITP from a previous connection between the nodes would have been saved and used during a new connection setup between the nodes until a new ITP value is negotiated during the new connection setup, as this was a known concept at the time of the alleged invention. (EX1002, ¶101.)

Like SIP, the proposed modification to Morris would have involved starting the preliminary ITP in response to detecting at least one of a received packet or a sent packet such as in response to detecting a packet sent to initiate connection setup in Morris. (EX1005 ¶[0076].) And once a value for the ITP is negotiated during

connection setup and the connection is established, the Morris-SIP system would have updated the preliminary ITP information to the negotiated ITP information such that the negotiated ITP information would have been used to detect a similar timeout in the established connection, as discussed below. (*Id.*); (EX1002, ¶¶102-103.)

For example, in the proposed modification, the preliminary ITP information (set, e.g., based on the round-trip time or a saved parameter from a previous connection) would have been used to configure a user-timeout type of timeout similar to Morris, i.e., SIP's Timer B ("first type of time period") such that it would have been initiated upon sending of the initial connection setup packet in Morris' TCP-based connection establishment procedure. (EX1005 ¶¶[0069], [0076], [0120].); (EX1002, ¶104.)

Such a user timeout type of timeout would have been initiated at the sending node upon the sending of a non-empty packet and would run at least until an acknowledgment (ACK) associated with the sent packet is successfully received at the sending node. (EX1002, ¶105; EX1005 ¶[0069]; EX1018, 3.)⁹ This type of user

⁹ While RFC 793, which describes TCP and upon which the Morris disclosure is based, does not describe initiating a timeout similar to a user timeout during

timeout operates similar to the Timer B in SIP, as detection of both of them leads to the closing of the connection. (EX1002, ¶105.)

Thus, while SIP's Timer B runs during connection setup and Morris's TCP user timeout runs after the connection is set up, a POSITA would have considered both SIP's Timer B and Morris' user timeout to be similar types of timeouts as they function similarly (e.g., they are both initiated upon the sending of a packet and if no response to the packet is received for the timeout duration, the connection is deactivated, as recited in claim elements 40.g-h). (EX1002, ¶106.) As such, when implementing SIP's teachings regarding Timer B used for timeout detection during connection setup in Morris' system/method, as discussed herein, a POSITA would have also drawn from Morris's teachings regarding implementation of the similar TCP user timeout in Morris. (*Id.*) And a POSITA would have understood that the "first type of time period" (claim elements 40.d, 40.g-h) in the Morris-SIP combination is a type of time period characterized by, e.g., starting upon the sending of a response-eliciting packet (like Morris's ACK-eliciting packets or SIP's Invite message) and if no response to the sent packet is received for the duration of the time

connection setup, it would have been obvious to modify Morris to include such a mechanism in the Morris-SIP system, as discussed below. (EX1002, 105 n.15.)

period, leading to deactivation of the connection. (*Id.*; *see also infra* Sections IX.A.1.g-h.)

A POSITA would have found it obvious and would have known how to modify Morris to incorporate SIP's teachings as proposed above, for the reasons discussed above and below. (*See, e.g.*, EX1006, 125-127, FIG. 5; EX1002, ¶107.) For example, the use of detecting a timeout during setup or establishment of communication between two nodes and closing down the communication upon timeout detection was well-known at the time of the alleged invention. (*See, e.g.*, EX1019, ¶¶[0182]-[0183], [0189], [0410], FIGS. 8G, 21; EX1034, ¶¶[0010], [0019]-[0026]; EX1086, [0064].)

A POSITA would have recognized that networking concepts implemented on one layer of the network stack (such as the timeout detection mechanism during session establishment setup in the application layer in SIP) could have been implemented on another layer of the network stack. (EX1019, ¶¶[0182]-[0183], [0189], [0410], FIGS. 8G, 21; EX1002, ¶106.) Indeed, the timeout detection mechanisms (like those discussed below in claim elements 40.g-40.h) could have been implemented on an application layer (or another layer other than a transport layer). (EX1002, ¶¶106-111; *see also infra* Section IX.A.1.e.)

In this regard, a connection or session between two communicating nodes is not limited to the transport layer, but can exist on other layers as well, and the

problems associated with such connections like wasted bandwidth apply regardless of the layer. (EX1002, ¶108.) In the networking field, protocols often mix and match concepts from other protocols including the use of timeout mechanisms. (*Id.*; EX1009, 101-102 ; EX1007, 1:14-28, 1:49-50, 1:63-2:7, 4:8-11, 4:25-37, 5:21-28; EX1028, 16:66-7:2, 20:36-41. 23:45-59.). Thus, a POSITA would have understood that certain problems and mechanisms regarding the establishment and management of connections between two nodes may be common regardless of whether the connection is at the transport layer or the application layer, and therefore a POSITA would have considered solutions to such problems regardless of the layer. (EX1002, ¶108.)

In view of the foregoing, a POSITA would have had the capability and knowledge to implement, and found it obvious to try, the above modification to include a timeout detection mechanism during connection setup in Morris (as taught by SIP) while ensuring that Morris' apparatus performed properly. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007). Therefore, a POSITA would have had a reasonable expectation of success that the combined Morris-SIP system would have been operated as expected (e.g., establish connection between nodes including negotiation of communication parameters during connection setup along with the ability to detect a lack of activity during the connection setup, and applying the negotiated communication parameter(s) to detect a lack of activity in the connection

after connection establishment). (EX1002, 109.)¹⁰ *See also Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1379-81 (Fed. Cir. 2023) (holding that Petitioner need not show that the proposed substitution was necessarily an improvement but rather would have been a suitable option).

The above modification would have been a mere combination of known technologies (e.g., SIP's disclosed concept of detecting a timeout during communication establishment between nodes incorporated into Morris' disclosed systems and methods for establishing connections while allowing for negotiation of connection parameters), according to known methods (e.g., timeout detection mechanisms during connection setup as widely known in the networking field), to achieve predictable results (e.g., the ability to detect and shut down idle, underactive, or dead link during connection setup). *See KSR*, 550 U.S. at 416–18; (EX1002, ¶110).

¹⁰ The proposed modification would have resulted in the Morris-SIP system implementing a protocol that is not TCP and is not a TCP extension. (*See infra* Section IX.A.1.e.(3).)

Therefore, the Morris-SIP system discloses or suggests receiving, at the apparatus, a value (“first information”) on which at least a preliminary ITP information (“first duration”) for detecting a user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”) is based. (EX1002, ¶111.)¹¹

Further, a POSITA would have understood that the Morris-SIP system’s user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”) “does not include a user timeout period of transmission control protocol (TCP),” to the extent this claim language can be understood. (EX1002, ¶112.) As discussed below, the ’856 patent is limited to TCP-based embodiments. (*See infra* Section X.A.1.) Thus, the ’856 patent and its priority applications do not describe any timeouts that are not TCP timeouts. (*Id.*)

To the extent this claim can be understood, the Morris-SIP system’s user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time

¹¹ A POSITA would have had the same motivation, skills, capabilities, and expectation of success, as described above for element 40.d in configuring the apparatus in the combined Morris-SIP system/process to execute the instructions for perform the features recited in the remaining claim elements. (*See, e.g., infra* Sections IX.A.1.e-h, IX.A.2-4.)

period”) “does not include a user timeout period of transmission control protocol (TCP)” because TCP (as defined in RFC 793) does not include a user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B. (*See infra* Section IX.A.1.e.3.). Specifically, the user timeout period of TCP is a timeout that is implemented after the TCP three-way handshake, i.e., after the TCP connection is set up. (EX1018, 3, 5-7.) On the other hand, the Morris-SIP system’s user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”) is a timeout period used to detect inactivity during connection setup, as discussed above, which is not how TCP implements its user timeout. (EX1002, ¶113.)

e)

- (1) **generating a first packet including a first parameter field identifying first metadata for use in determining a second duration for detecting the first type of time period,**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶114.) For example, the Morris-SIP combination discloses generating a packet (“first packet”) including an ITP header identifying first metadata (e.g., a value) for use in determining negotiable ITP information (“second duration”) for detecting the user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”). (EX1005, [0073]-[0081] (describing this feature with respect to block 204 in Figure 2 and exemplary packet with ITP header 820 in Figure 8), [0082]

(similarly describing this feature with reference to message 704 in Figure 7), claims 11, 22.)¹²

¹² Petitioner references the ITP information included in the first packet in Morris being mapped to the “second duration” as “negotiable” ITP information to distinguish it from the “preliminary” ITP information being mapped to the “first duration” in element 40.d. (EX1005, [0005], [0094], [0105], [0124].)

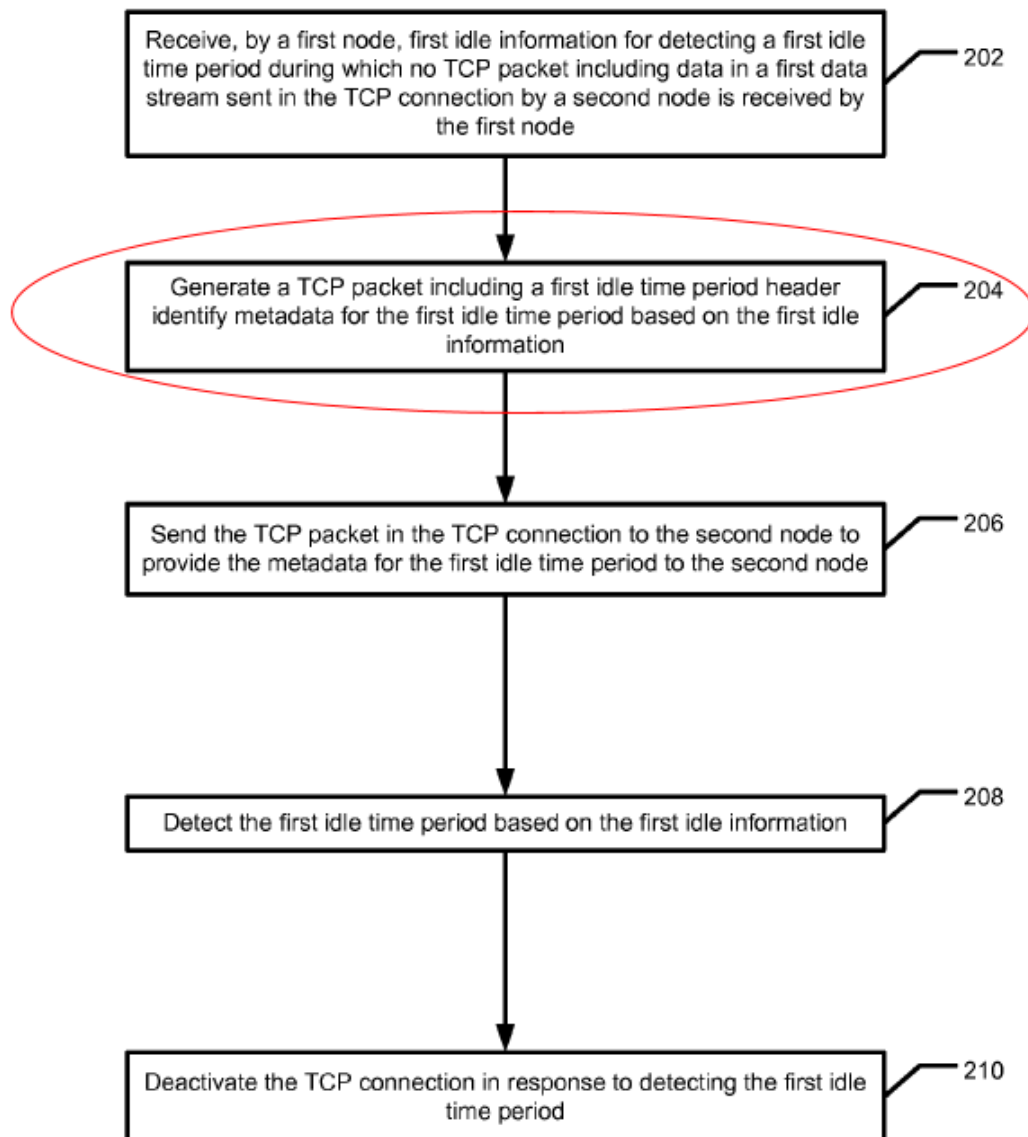


Fig. 2

(EX1005, FIG. 2 (annotated).)

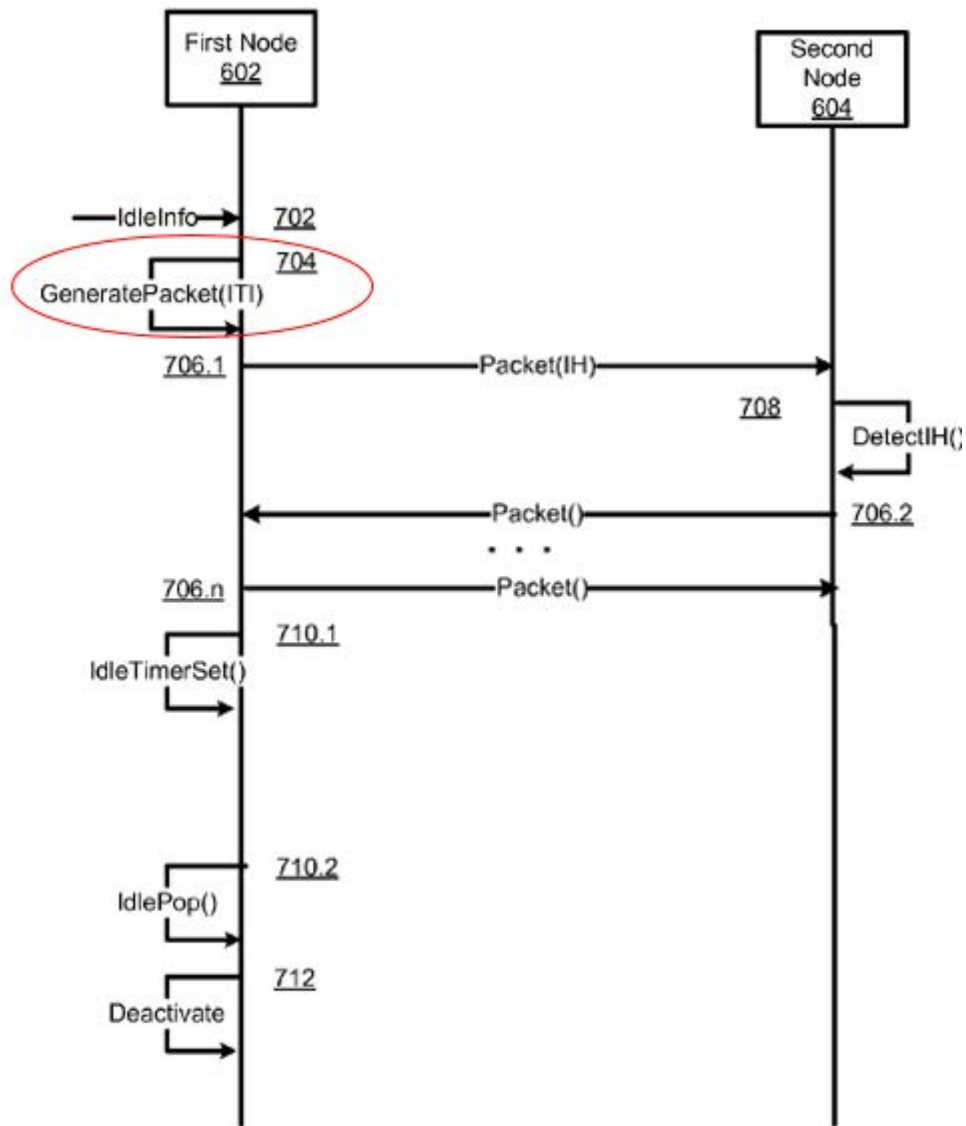


Fig. 7

(EX1005, FIG. 7 (annotated).)

(2) where the first packet is not a synchronize (SYN) packet, and

The Morris-SIP combination discloses or suggests this limitation, to the extent this claim can be understood. (EX1002, ¶¶115-121.)

As an initial matter, the '856 patent is limited to TCP-based embodiments. (*See infra* Section X.A.1.) Thus, the '856 patent and its priority applications do not describe any packet that is not a SYN packet outside of a TCP-based environment. (*Id.*). Indeed, the only mention of an initial connection setup packet (like the claimed “first packet”) in the '856 patent is that of a TCP SYN packet to setup a TCP connection using a TCP three-way handshake. (EX1001, 12:12-26.) To the extent this claim is understood as requiring the “first packet” to not be a TCP SYN packet (which is unsupported by the '856 patent and its priority applications), the Morris-SIP combination discloses or suggests this limitation for at least two reasons.

First, as discussed immediately below with respect to claim element 40.e.3, the Morris-SIP system implements a protocol that is not TCP or a TCP extension. (*See infra* Section IX.A.1.e.3.) Thus, the first packet generated by the Morris-SIP system is not a TCP SYN packet because it is a packet for use in a protocol different from TCP. (*Id.*; EX1002, ¶117.)

Second, it would have been obvious to configure the first packet generated by the Morris-SIP system such that it is not a SYN packet on the teachings of SIP and

the knowledge of a POSITA. (EX1002, ¶118.) For example, as discussed above with respect to claim element 40.d, SIP discloses a three-way handshake where the client transaction sends an INVITE request (“a first packet”), the server transaction sends responses, and the client transaction sends an acknowledgement (ACK). (See *supra* Section IX.A.1.d; see also EX1006, 125.) SIP’s INVITE packet is not a SYN packet (e.g., a TCP SYN packet) because SIP is an application layer protocol that establishes the session based on its three-way handshake (and not the TCP-three-way handshake), and can be run with both TCP and UDP. (See *supra* Section IX.A.1.d.; EX1006, 142, 125 (sections 17.1.1.1-2); see also *id.*, 34 (Section 7.5), 52, 146 (section 18.2.2).).

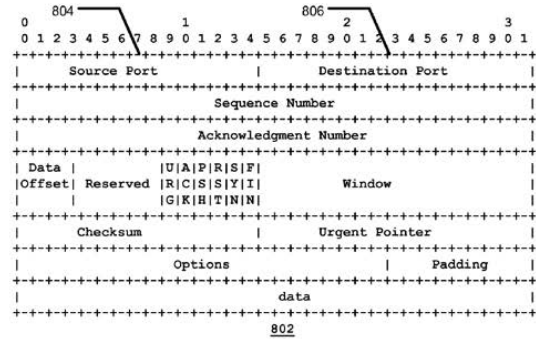
Moreover, as shown below in a side-by-side comparison of an SIP Invite packet (which is a text-encoded message) and a TCP SYN packet, the SIP Invite packet is not a SYN packet as they are formatted differently and include different fields. (EX1006, 11-13 (describing and illustrating a sample INVITE packet); EX1005, FIG. 8 along with corresponding description in [0008], [0078]-[0081], [0115].)

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP pc33.atlanta.com;branch=z9hG4bK776asdhds
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710@pc33.atlanta.com
CSeq: 314159 INVITE
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

(Alice's SDP not shown)

```



(EX1006, 12 (showing exemplary SIP INVITE packet); EX1005, FIG. 8 (showing TCP SYN packet).)

Indeed, in addition to the fields shown above in the SIP Invite packet like the “Via” field and the “Max-Forwards” field, SIP discloses that its INVITE packet may include many other header fields defined in Section 20. (EX1006, 13, 159-182 (section 20 describing various header fields of an SIP INVITE packet).) Accordingly, SIP’s INVITE packet is not a SYN packet (e.g., a TCP SYN packet). (EX1002, ¶120.)

A POSITA would have recognized the flexibility provided by configuring Morris such that it would implement a three-way handshake similar to SIP (i.e., on the application layer using packets like those described by SIP), as it would have allowed the Morris-SIP system to run with both UDP and TCP protocols. (EX1002, ¶121.) A POSITA would have had the capability and knowledge to implement the above modification to Morris for at least the reasons given above with respect to

claim element 40.d, and thus a POSITA would have had a reasonable expectation of success that the combined Morris-SIP system would have operated as expected. (*Id.*)

**(3) [where the first packet] is for use in a protocol:
that is not TCP, and that is not a TCP
extension;**

The Morris-SIP combination discloses or suggests this limitation for at least two reasons. (EX1002, ¶¶122-125.)

First, the combined Morris-SIP system implements a protocol that is not TCP or a TCP extension by inclusion of a mechanism to detect inactivity during connection setup in the Morris system based on SIP's teachings, as explained above with respect to claim element 40.d. (EX1002, ¶123; *supra* Section IX.A.1.d.) This is because TCP (as defined by RFC 793) does not disclose the option (e.g., by using the options field in a TCP header) to introduce the mechanism taught by the Morris-SIP system. (EX1005, [0002], [0051], [0078], [0109]; *see generally* EX1008; *see also infra* Section X.A.1.) Further, a POSITA would have understood that a TCP extension typically refers to the use of TCP options in a TCP header. (EX1005, ¶[0080] (describing a TCP extension in the context of TCP options in a TCP packet); EX1090, 7.) Thus, the Morris-SIP system implements a protocol that is not TCP or a TCP extension for establishing a connection. (*See generally* EX1005; EX1008; *see also infra* Section X.)

Second, the combined Morris-SIP system implements a protocol that is not TCP or a TCP extension based on PO's understanding of the claims. (EX1002, ¶124.) According to PO, the "protocol: that is not TCP, and that is not a TCP extension" in claim 40 encompasses a TCP-variant protocol. For example, claim 39 of the '856 patent, which depends from claim 1, recites that "the protocol [that is not TCP and not a TCP extension] includes a TCP-variant protocol." (EX1001, 29:8-9.) In patents related to Morris which share substantially the same specification as Morris, PO has characterized and claimed Morris' above-noted TCP-based disclosures in the context of a TCP-variant protocol using TCP-variant packets in a TCP-variant connection. (See, e.g., EX1037, claim 1; EX1036, claim 1; EX1087, claim 78.)¹³ In addition, PO has further asserted that its TCP-variant protocol encompasses a UDP-based protocol, which is not a TCP-based protocol. (See, e.g., EX1088, 2, 5; EX1089, 2, 5; EX1017, 252-259.)¹⁴ Thus, in light of claim 39 stating

¹³ Petitioner does not agree that the claims reciting the TCP-variant features in PO's asserted patents are compliant with 35 U.S.C. § 112. (See, e.g., EX1080, 68-74.)

¹⁴ Petitioner's references to PO's infringement allegations are not indicative of any concession that any accused instrumentality infringes any asserted claim of PO's patent(s).

that the protocol that is not TCP and not a TCP extension further includes a TCP-variant protocol and PO's understanding that Morris teaches TCP-variant protocols, to the extent that the Board finds that the Morris-SIP combination encompasses a TCP-variant protocol, it still teaches that the first packet is for use in a protocol that is not TCP and not a TCP extension, to the extent this feature can be understood.

Therefore, the Morris-SIP combination discloses or suggests claim element 40.e.3. (EX1002, ¶125.)

f)

- (1) setting up a first connection, by sending, from the apparatus to a node, the first packet to provide the first metadata to the node, for use by the node in determining the second duration for detecting the first type of time period,**

The Morris-SIP combination discloses or suggests these limitation. (EX1002, ¶126.) For example, regarding limitation 40.f.(1), the Morris-SIP combination discloses setting up the first connection, by sending, from the first node 602 (“apparatus”) to a second node 604 (“node”), the first packet to provide the first metadata to the second node 604, for use by the second node 604, in determining the negotiable ITP information (“second duration”) for detecting the user-timeout type of timeout similar to Morris, i.e., SIP's Timer B (“first type of time period”). (EX1005, [0083]-[0084] (describing this feature with respect to block 206 in Figure 2 and message 706.1 in Figure 7), claims 11, 22.)

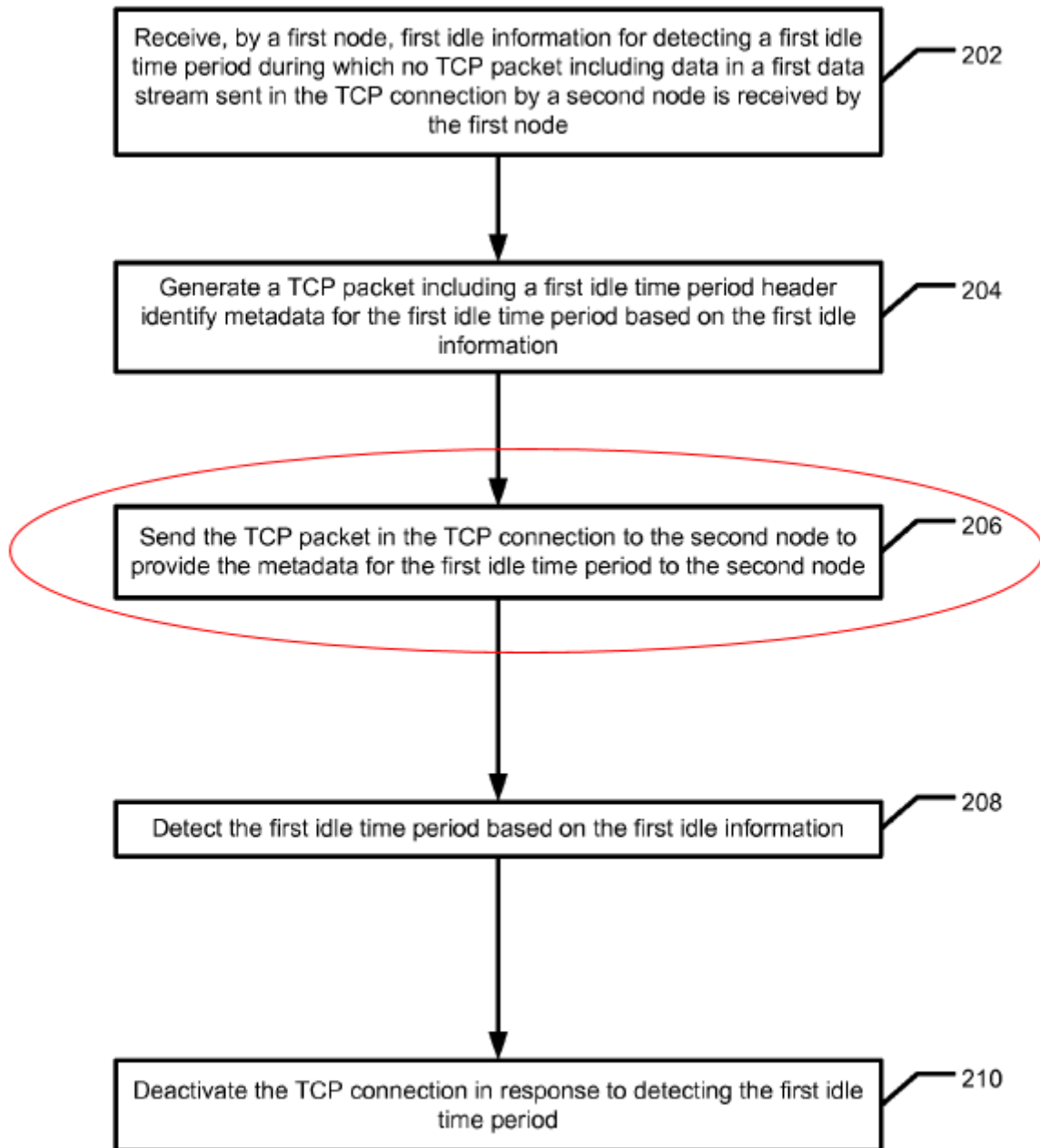


Fig. 2

(EX1005, FIG. 2 (annotated).)

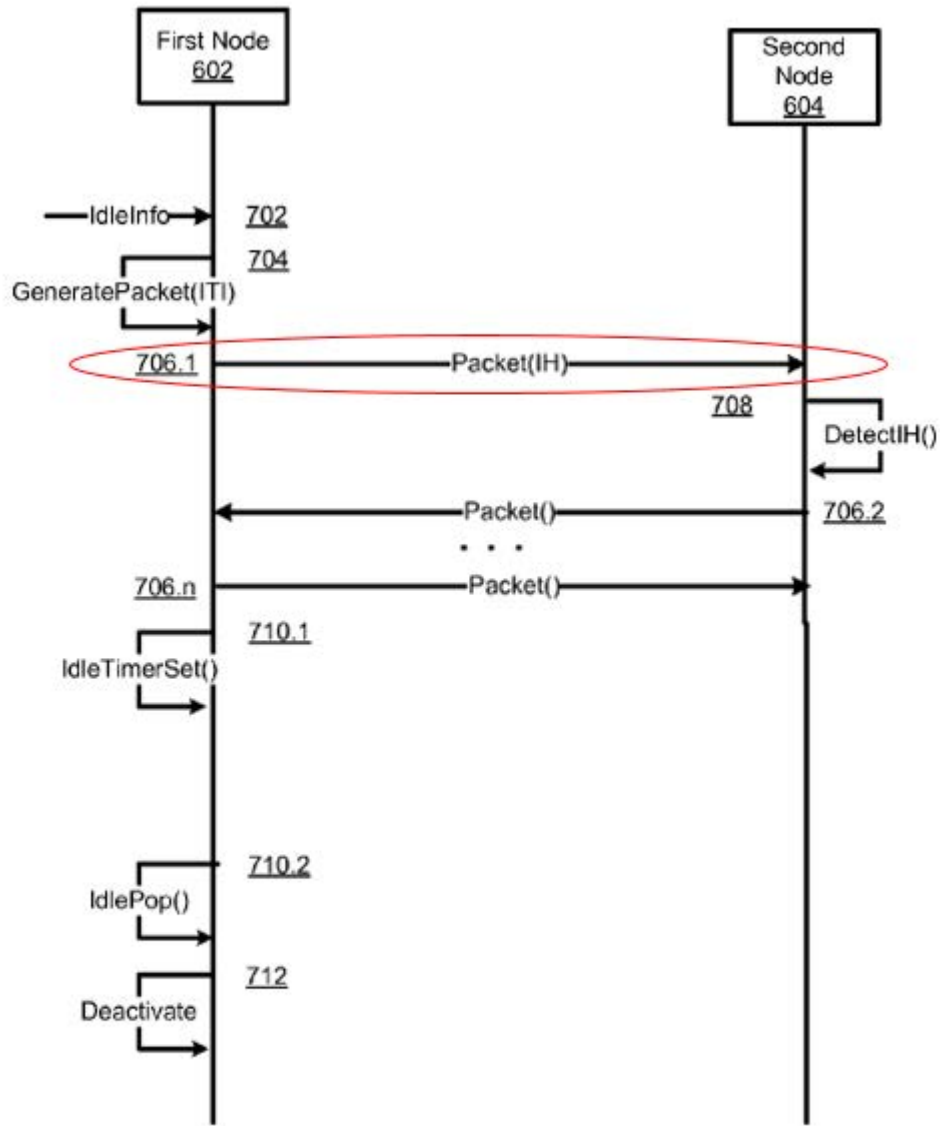


Fig. 7

(EX1005, FIG. 7 (annotated).)

- (2) where the first duration is not negotiated during the first connection set up between the

**apparatus and the node for the first connection,
and**

Regarding limitation 40.f.(2), as discussed above with respect to claim element 40.d, the Morris-SIP combination's preliminary ITP information ("first duration") would have been set based on the round-trip time or a saved parameter from a previous connection, prior to setting up the first connection. (*See supra* Section IX.A.1.d.) Thus, the preliminary ITP information ("first duration") "is not negotiated during the first connection set up between the apparatus and the node for the first connection," as claimed. (EX1002, ¶127.)

**(3) the second duration is negotiated during the
first connection set up between the apparatus
and the node for the first connection, and**

Regarding limitation 40.f.(3), the Morris-SIP combination discloses that the negotiable ITP information ("second duration") is negotiated as part of setting up the first connection ("is negotiated during the first connection set up between the apparatus and the node for the first connection"). (EX1005, [0094] ("The exchange of ITP headers may include a negotiation between first node 602 and second node 604."), [0105] (similar), [0124]; EX1002, ¶128.)

**(4) where the first connection set up further
includes, in addition to sending the first packet:**

**(a) based on sending the first packet,
receiving, at the apparatus from the node,
a second packet, and**

**(b) based on receiving the second packet,
sending, from the apparatus to the node,
a third packet;**

Regarding limitations 40.f.(4).(a)-(b), the Morris-SIP combination discloses performing a three-way handshake to set up the connection between the apparatus and the node, as discussed above for limitation 40.f.(1) (discussing the apparatus sending the “first packet” as part of the three-way handshake). (*See supra* Section IX.A.1.f.(1); *see also supra* Section IX.A.1.e (discussing the generation of the first packet for use in the three-way handshake).) Both Morris and SIP describe that such a three-way handshake includes, after sending the first packet, receiving at the apparatus from the node, a responsive packet (“second packet”) to the first packet as required by limitation 40.f.(4).(a). (EX1005, [0076] (describing the ITP header being exchanged in the RFC 793 three-way handshake); EX1008, 27-28 (RFC 793 describing its three-way handshake involving a second packet including an ACK and a SYN in steps 2-3), 44 (RFC 793 disclosing that data cannot be exchanged between nodes until after connection establishment); EX1006, 16 (describing “the INVITE/**200**/ACK three-way handshake used to establish SIP sessions”), 125 (describing a second packet in the form of one or more responses to the INVITE message).) And after receiving the second packet, both Morris and SIP disclose sending, from the apparatus to the node, an acknowledgment packet (“third packet”). (EX1005, [0076]; EX1008, 27-28 (RFC 793 describing its three-way handshake

involving a third packet including an ACK in step 4), 44; EX1006, 16 (describing “the INVITE/200/ACK three-way handshake used to establish SIP sessions”), 125 (describing a third packet in the form of an ACK message); EX1002, ¶129.)¹⁵

- g) based on detecting, as a function of the first duration and by the apparatus during at least a portion of the first connection set up, a first time period of the first type of time period, at least partially closing the first connection; and**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶130.) For example, this feature is taught for at least the reasons explained in claim element 40.d. (*See supra* Section IX.A.1.d.) For example, the Morris-SIP system discloses that in response to detecting, based on the preliminary ITP information (“first duration”) and an absence of an ACK packet acknowledging the sent first packet and by the first node 602 (“apparatus”) during at least a portion of the first connection setup, a preliminary ITP (“first time period”) of the user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”), at least

¹⁵ While it is unclear whether limitations 40.f.(4).(a)-(b) require the three-way handshake to be carried out in a non-TCP environment, even if these limitations are interpreted that way, it would have been obvious to implement the three-way handshake on the application layer, as discussed above. (*See supra* Section IX.A.1.e.2.)

partially close the first connection. (EX1005, [0088]-[0089] (describing block 208 in Figure 2 relating to detection of the ITP at first node), [0092]-[0093] (similar), [0096]-[0097], [0106]-[0109].) While the cited Morris disclosures concern at least partially closing a connection in response to the detection of an ITP during an established connection, these teachings would equally apply to the detection of a preliminary ITP during connection setup disclosed in the Morris-SIP combination discussed above. (*See supra* Section IX.A.1.d.)

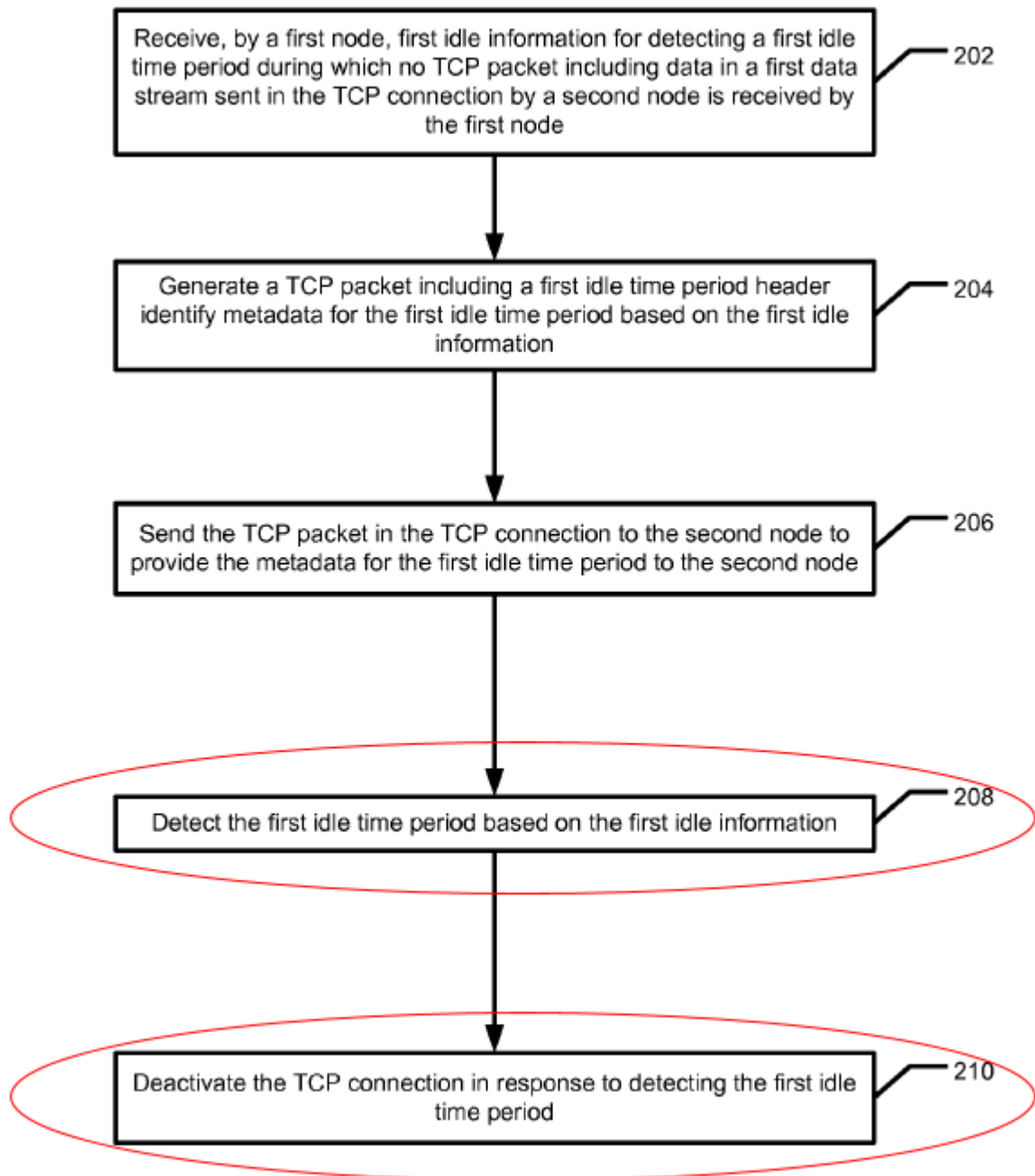


Fig. 2

(EX1005, FIG. 2 (annotated).)

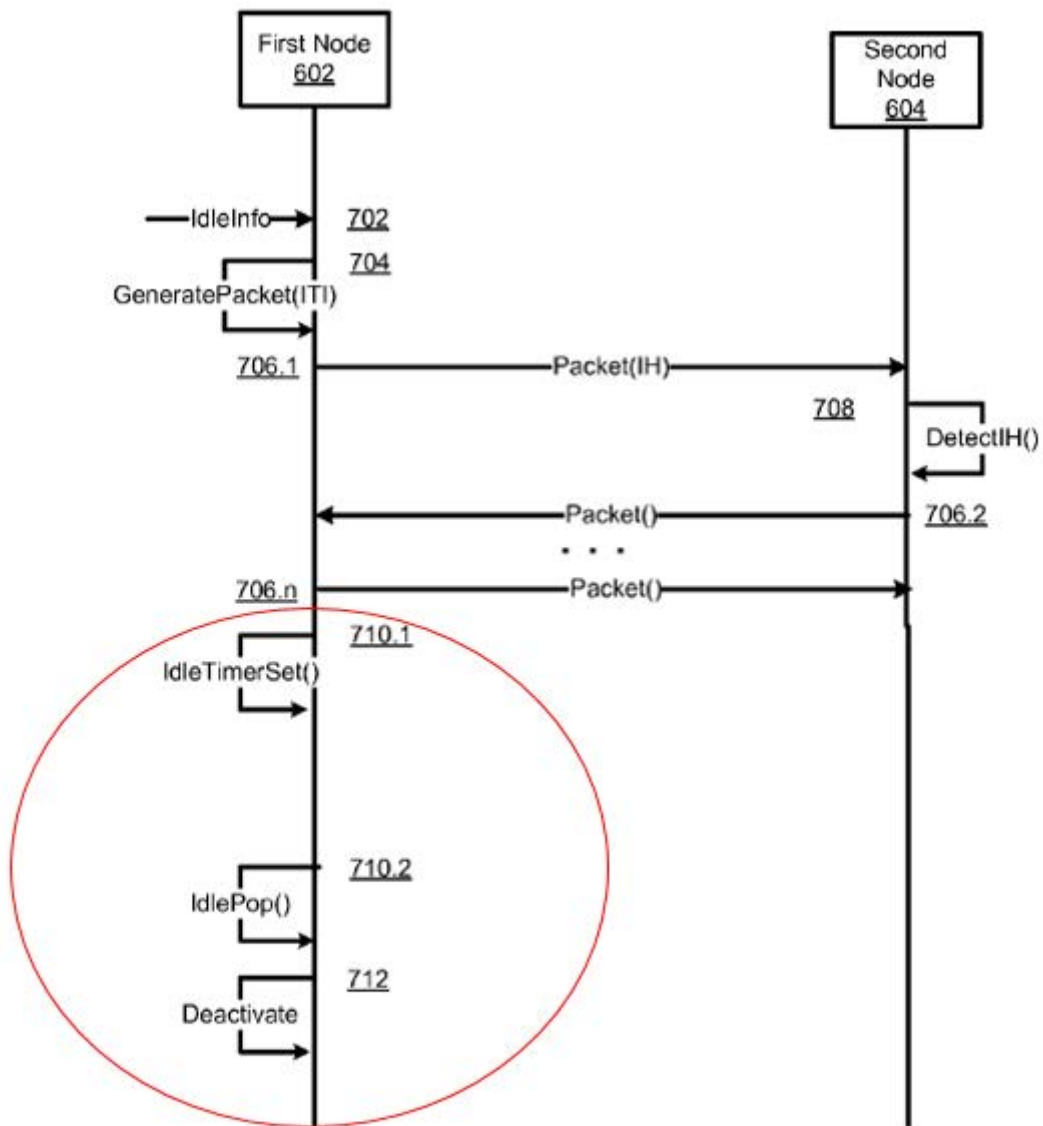


Fig. 7

(EX1005, FIG. 7 (annotated).)

- h) based on detecting, as a function of the second duration and by the apparatus during the first connection, a second time period of the first type of time period, at least partially closing the first connection.**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶131.) For example, the Morris-SIP system discloses that in response to detecting, based on the negotiable ITP information (“second duration”) and an absence of at least one ACK packet acknowledging a previously sent ACK-eliciting packet and by the first node 602 (“apparatus”) after the first connection setup (e.g., after the three-way handshake) and a use of the preliminary ITP information (“first duration”) is changed to a use of the negotiable ITP information (“second duration”), a negotiated ITP (“second time period”) of the user-timeout type of timeout similar to Morris, i.e., SIP’s Timer B (“first type of time period”), at least partially close the first connection. (EX1005, [0088]-[0089] (describing block 208 in Figure 2 relating to detection of the ITP at first node), [0092]-[0093] (similar), [0095] (describing negotiated ITP), [0096]-[0097] (describing detection of ITP at first node 602 by way of messages 710.1 and 710.2 in Figure 7), [0106]-[0109] (describing block 210 in Figure 2 and message 712 in Figure 7 which relate to first node 602 at least partially closing the connection by releasing resources allocated for the connection), [0105] (negotiated ITP), [0124] (similar), claims 11, 22.)

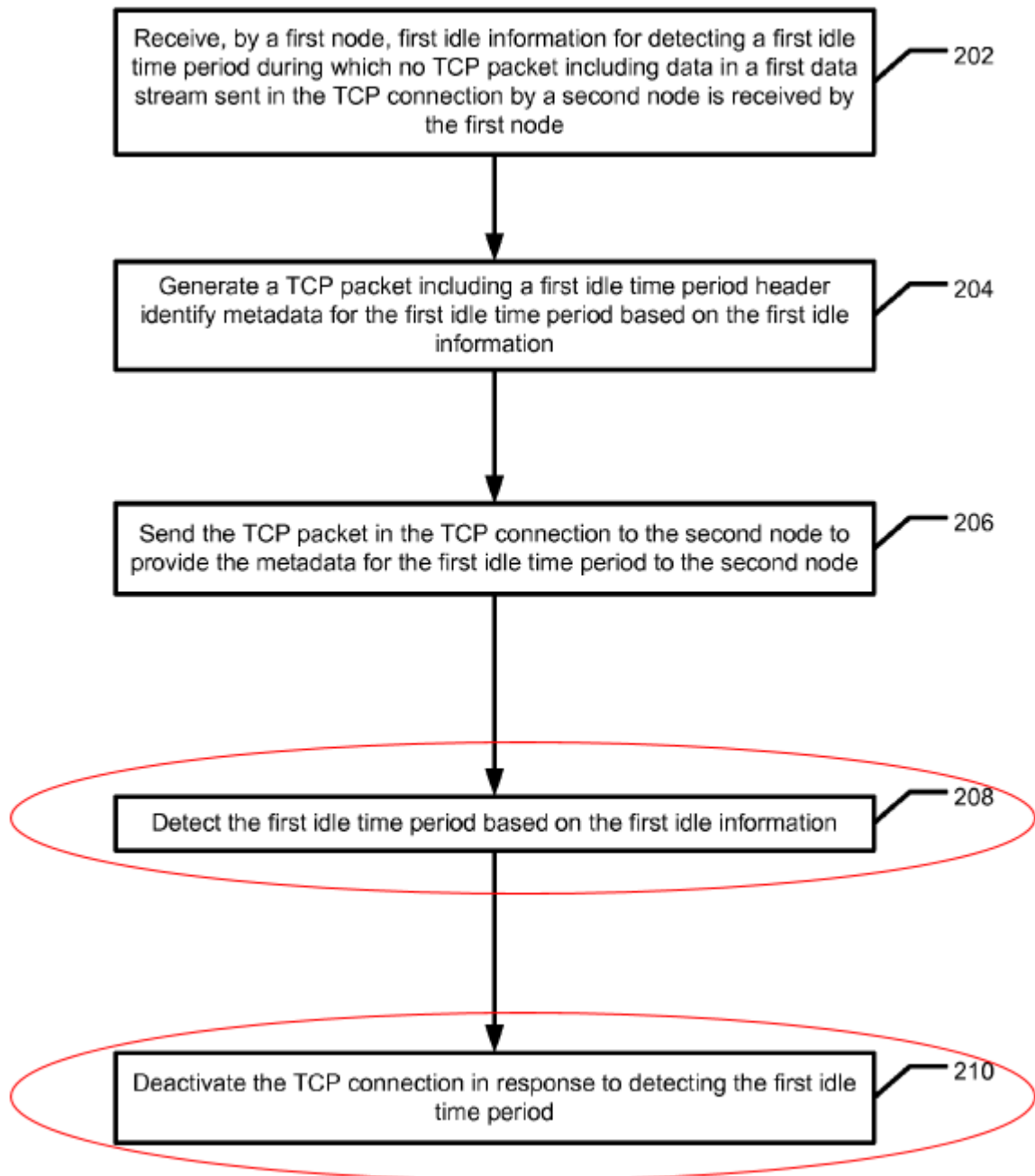


Fig. 2

(EX1005, FIG. 2 (annotated).)

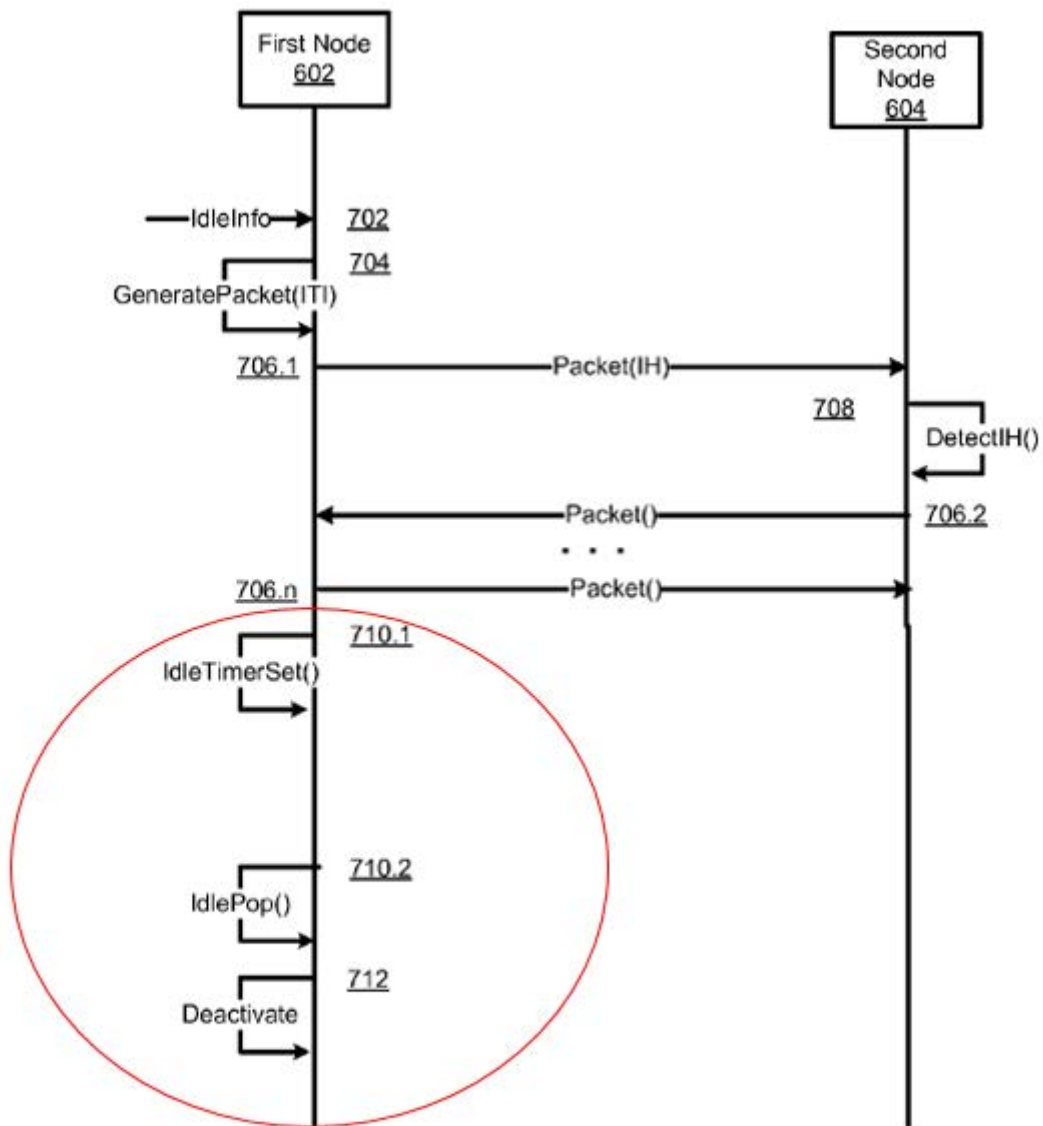


Fig. 7

(EX1005, FIG. 7 (annotated).)

2. Claim 41

- a) The method of claim 40, wherein the apparatus is configured to: based on detecting, as a function of a third duration, a third time period of a second type of time period, perform at least one action.**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶132.) For example, the Morris-SIP system discloses that based on detecting, as a function of a duration of a keep-alive period (“third duration”), a keep-alive period (“third time period”) of a keep-alive type of time period (“second type of time period”), at least one keep-alive packet is sent (“perform at least one action”). (EX1005, [0086]; *see also id.*, [0069]-[0071], [0085], [0099], claim 14.)

3. Claim 42

- a) The method of claim 41, wherein: the at least one action includes setting or resetting a timer;**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶133.) As discussed above, in response to detecting the keep-alive period (“third time period”), performing the at least one action includes first node 602 sending at least one keep-alive packet. (*See supra* Section IX.A.2.) Morris teaches that the keep-alive packet is sent to determine whether the connection is active. (EX1005, [0086], [0099]; *see also* EX1009, 101-102 (describing keep-alive mechanism with keep-alive packets eliciting acknowledgments to confirm active connection).) An obvious way to implement such a system would have been to set or reset a timer

(e.g., the keep-alive timer mentioned above) to retransmit the keep-alive packet a certain number of times in an attempt to elicit an acknowledgment to the keep-alive packet and confirm that the connection is active. (EX1002, __; EX1021, 67:1-68:25 (describing, e.g., a “Keep Alive Interval” which indicates an interval in which the keep-alive packets are periodically sent); EX1012, 2:45-3:25.) Given the well-known concept of retransmitting packets in the networking field at the time of the alleged invention, a POSITA would have known how to program such a timer to periodically send keep-alive messages in the Morris-SIP system and would have had a reasonable expectation of success in the system properly executing this functionality. (EX1002, ¶133; EX1008, 14, 45 (describing retransmission timeout); EX1009, 90-91 (section 4.2.2.15).)

b) the at least one action does not include connection closure; and

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶134.) The at least one action includes sending a keep-alive packet and setting or resetting a timer, neither of which is a “connection closure,” as claimed. (*See supra* Sections IX.A.2-3; EX1005, [0086], [0099].)

c) the at least one action includes sending a signal.

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶135.) As discussed above, in response to detecting the keep-alive period (“third

time period”), performing the at least one action includes first node 602 sending at least one keep-alive packet, which is a “signal.” (*See supra* Section IX.A.2.)

4. Claim 48

- a) **The method of claim 42, wherein the third time period is detected as a function of the third duration, by being detected when no acknowledgement packet is detected, by the apparatus during the third duration, as being received and processed as an acknowledgement in the first connection to acknowledge a sent packet of a plurality of sent packets sent by the apparatus,**

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶¶136-137.) For example, as discussed above for claim 41, the keep-alive period (“third time period”) is detected as a function of the duration of the keep-alive period (“third duration”), by monitoring for any non-empty packets sent or received in the connection. (*See supra* Section IX.A.2.) The keep-alive mechanism is designed to detect periods of idleness in a connection. (EX1009, 101 (section 4.2.3.6).) Thus, a keep-alive period (administered, e.g., by a keep-alive timer) would have been configured to be started at the time a packet such as an ACK-eliciting packet is sent because that marks the start time of a period of idleness in the connection (e.g., a time where no packets are sent or received in the connection). (EX1002, ¶136; EX1005, [0086].) And in a scenario where no packet including a received acknowledgement packet is detected by first node 602 (“apparatus”) for the duration of the keep-alive period (“when no acknowledgement packet is detected”), the keep-

alive period would have been detected (e.g., with the keep-alive timer expiring). (EX1005, [0086], [0099].)

No acknowledgement packet would have been detected “as being received and processed as an acknowledgement in the first connection to acknowledge a sent packet of a plurality of sent packets sent by the apparatus,” as claimed. (EX1002, ¶137.) This is because for a previously sent data packet (from amongst a plurality of packets sent by the apparatus) to be successfully acknowledged, the apparatus must receive the acknowledgement to the previously sent data packet and then process the acknowledgment to ensure that it covers the sequence number associated with the sent data packet. (EX1005, [0086], [0088]-[0089], [0092]-[0093], [0095]-[0097], [0106]-[0109]; EX1008, 28-29, 45; EX1002, ¶137.) If the acknowledgment packet was detected, i.e., the acknowledgment packet was received and processed successfully, the keep-alive period (e.g., implemented by the keep-alive timer) would have been reset since the system would have detected activity in the connection (indicating that the connection is alive). (EX1002, ¶137.)

b) where the third duration starts for each of the plurality of sent packets when at least one of the plurality of sent packets is sent.

The Morris-SIP combination discloses or suggests this limitation. (EX1002, ¶138.) For example, the keep-alive period duration (“third duration”) of the keep-alive period would have started for each of the plurality of sent data packets because

as discussed above, the keep-alive mechanism is designed to detect periods of idleness in a connection. Thus, a keep-alive period (administered, e.g., by a keep-alive timer) would have been configured to be started for each of the plural sent packets when at least one of the plural sent data packets is sent. (EX1005, [0086].) In other words, every time the system detected activity (by detecting that a packet is sent), it would determine that the connection is alive and thus restart the keep-alive mechanism (as opposed to letting it run and expire). (*Id.*; EX1002, ¶138.)

5. **Claim 49**

- a) **The method of claim 48, wherein: during the at least portion of the first connection set up, the detection of the first time period of the first type of time period is a function of the first duration, by being a function of whether, for the first duration, no packet is received and processed to keep the first connection active; and**

The Morris-SIP combination discloses or suggests this limitation in at least two ways. (EX1002, ¶¶139-141.)

First, as explained, in the Morris-SIP system, during at least the portion of the first connection setup, the detection of the preliminary ITP (“first time period”) is a function of the preliminary ITP information (“first duration”). (*See supra* Sections IX.A.1.g.) Such detection of the preliminary ITP (“first time period”) would have been a function of whether, for the duration indicated by the preliminary ITP information, no ACK packet acknowledging a previously sent data packet is received and processed to keep the connection active (e.g., after being received, the

sequence number indicated in the ACK packet is processed by checking to see if it covers the sequence number included in the previously sent data segment). (EX1005, [0088]-[0089], [0092]-[0093], [0095]-[0097], [0106]-[0109]; EX1008, 28-29, 45; EX1002, ¶140; *see also* Section IX.A.4.)

Second, this limitation is taught by the Morris-SIP system during a disconnection scenario. During a disconnection (e.g., when first node 602 is detected from the network such that it can no longer communicate with second node 604), no packet of any kind (e.g., a data packet, a keep-alive packet, a retransmission packet, or an acknowledgment packet), would have been received by first node 602 since none of these packets could have been received by the first node 602 if it was disconnected from the network. (*Id.*) If such a disconnection scenario occurred during a portion of the first connection setup, then detection of the preliminary ITP (“first time period”) would have been a function of whether, for the duration indicated by the preliminary ITP information, no packet of any kind is received and processed to keep the connection active. (*Id.*; EX1002, ¶141.)

- b) **during the first connection, the detection of the second time period of the first type of time period is a function of the second duration, by being a function of whether, for the second duration, no packet is received in the first connection and processed to keep the first connection active.**

The Morris-SIP combination discloses or suggests this limitation in at least two ways. (EX1002, ¶¶142-143.)

First, as explained, in the Morris-SIP system, during the first connection (e.g., after the first connection setup), the detection of the negotiated ITP (“second time period”) is based on the negotiable ITP information (“second duration”). (*See supra* Section IX.A.1.h.) Morris teaches that such detection of the negotiated ITP (“second time period”) would have been based on whether, for the duration indicated by the negotiable ITP information, no ACK packet acknowledging a previously sent data packet is received and processed to keep the connection active (e.g., after being received, the sequence number indicated in the ACK packet is processed by checking to see if it covers the sequence number included in the previously sent data segment). (EX1005, [0088]-[0089], [0092]-[0093], [0095]-[0097], [0106]-[0109]; EX1008, 28-29, 45.) No other packet (e.g., a sent packet) would serve as the basis for the detection of the negotiated ITP because the basis for detecting the negotiated ITP would have been a packet responsive to a previously sent packet. (*Id.*; EX1002, ¶143.)

Second, this limitation is taught by the Morris-SIP system during a disconnection scenario such as the one discussed above for claim 48 (second theory). The Morris-SIP system would have been configured such that the first node 602 would have detected the second time period based on the second duration, along with an absence of any received packet type (e.g., a data packet, a keep-alive packet, a retransmission packet, or an acknowledgment packet), since none of these packets could have been received by the first node 602 if it was disconnected from the network. (EX1005, [0004]-[0005], [0010], [0062], [0106], [0108]-[0109] (discussing deactivation of connection upon ITP detection).) Thus, during a disconnection (e.g., when first node 602 is detected from the network such that it can no longer communicate with second node 604), no packet of any kind would have been received by first node 602. (*Id.*) If such a disconnection scenario occurred during the first connection, then detection of the negotiated ITP (“second time period”) would have been based on whether, for the duration indicated by the negotiable ITP information, no packet of any kind is received and processed to keep the connection active. (*Id.*; EX1002, ¶144.)

6. Claim 54

- a) The method of claim 49, wherein the first information is received for another connection other than the first connection.**

The Morris-SIP combination discloses or suggests this limitation for at least the reasons given above for element 40.d. (EX1002, ¶145; *supra* Section IX.A.1.d.) As explained, the value (“first information”) for the preliminary ITP information (“first duration”) may be saved (“received”) from connection parameters associated with a prior connection (“another connection other than the first connection”), e.g., a prior connection between the two nodes. (*Id.*)

X. EARLIEST EFFECTIVE FILING DATE OF ’856 PATENT

To comply with the written description requirement, the specification or earlier-filed application “must describe the invention sufficiently to convey to a person of skill in the art that the patentee had possession of the claimed invention at the time of the application, i.e., that the patentee invented what is claimed.” *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed Cir. 2005).

The ’856 patent relates to several patents and/or patent applications, as shown in the purported priority chain below:



**Subject to this
IPR Petition**



(See also *supra* Section II.B.2.)

However, as discussed below, the priority applications do not provide written description support for at least two features required by each of the challenged claims, as required by Section 112. (EX1002, ¶¶146-201.) Thus, the earliest possible effective filing date of the challenged claims is no earlier than February 24, 2021, the filing date of U.S. Application No. 17/184,554 (“the ’554 application”), from which the ’856 patent issued.

A. The ’856 Patent and Its Priority Applications Do Not Provide Written Description Support For the “First Packet . . . for Use in a Protocol: That Is Not TCP, and That Is Not a TCP Extension”

Independent claim 40 recites:

generating a first packet including a first parameter field identifying first metadata for use in determining a second duration for detecting the first type of time period, where **the first packet** is not a synchronize (SYN) packet, and **is for use in a protocol: that is not TCP, and that is not a TCP extension.**

(EX1001, 31:11-16.)

Claim 40 recites features relating to the use of a first packet in a protocol that is not TCP and not a TCP extension (generally referred to herein as the “non-TCP” features). The claims recite using the first packet to, e.g., set up a connection between an apparatus and a node, i.e., the claims encompass scenarios where the first packet is used in a protocol that does not utilize TCP at all and establishes non-TCP connections. (EX1002, ¶150.) This is consistent with PO’s infringement claim

chart, which maps the non-TCP features to a UDP-based protocol, which does not use TCP at all. (EX1032, 14-17.)

A POSITA would not have understood that the named inventor of the '856 patent had possession of the claimed invention, including the non-TCP features set forth in claim 40 at the time the '554 application was filed because the as-filed specification of the '554 application and the specifications of the '856 patent's priority applications do not support these features. (EX1002 ¶151.)

1. The '554 Application and Its Priority Applications Are Limited to TCP-Based Embodiments

The '554 application and its priority applications (except for the '642 application) share substantially the same as-filed specifications.¹⁶ (EX1002, ¶152.) Exhibits 1040, 1050-1054, and 1077-1078 are computer-generated redlines comparing the as-filed specifications of these priority applications including the '554 application (EX1004, EXS1038-1039, EXS1044-1048, EX1075). As shown in

¹⁶ The '642 application is directed to different subject matter and has little, if anything, in common with the subject matter of the '856 patent family. (EX1002, 152, n.20; EX1043, 108-111 (¶¶[0001]-[0006]); EX1049, 1, 3; *see also* EXS1038-1039, 1041, 1062-1074.) In any event, the '642 application does not describe any non-TCP features at-issue here. (EX1002, 152, n.20.)

exhibits 1040, 1050-1054, and 1077-1078, other than the changes to the summary sections in each of the priority applications (which were updated to reflect the claims being presented for examination), the specifications of the applications are substantially similar.¹⁷

The disclosures of these priority applications (including the '554 application), however, do not describe any non-TCP-based features (e.g., the use of a non-TCP-based protocol to set up a non-TCP connection using non-TCP packets)—the disclosures are limited to using the options field in a TCP header defined by RFC 793. Instead, as discussed below, these disclosures only describe embodiments based on TCP. (EX1002 ¶153.) The discussion below primarily focuses on how the '454 application does not provide adequate written description support for the non-TCP features as it is the earliest application in the priority chain. The remaining

¹⁷ The only change to the detailed description portion of the '802 application specification, relative to the originally filed '454 application, is the addition of a brief explanation of the well-known TCP three-way handshake already described in RFC 793 decades earlier. (EX1050, 15 (¶¶[0082]-[0087]); EX1008 (RFC 793), 31-32; EX1002 ¶152, n.21.)

applications in the priority chain are similarly defective given their specifications are substantially similar.¹⁸

Coming to the '454 application, it uses the term “TCP” nearly 400 times, including, for instance, in the specification (310 times), claims (72 times), abstract (3 times), and figures (14 times). (*See generally* EX1038 ('454 application), 99-106, 111-118, 120-165.) Not once does the '454 application refer to a protocol that is not TCP or a TCP extension (e.g., non-TCP) or a non-TCP connection/packet. (*Id.*; EX1002 ¶¶154-157.) In particular, the '454 application only discloses setting up a **TCP connection** (i) using the three-way handshake described in RFC 793 or (ii) in other unspecified ways. (EX1038, 147 (¶[0076]); EX1002 ¶157.)

Nowhere does the '454 application describe setting up a connection using a packet that is for use in a protocol that is not TCP or a TCP extension (e.g., a UDP-

¹⁸ Starting from the '802 application filed September 3, 2017, some of the priority applications began introducing terms such as “non-TCP” or “different from TCP” in their summary sections and claims. However, as discussed below in Section X.A.3, the introduction of such terms in the summary and claims sections, without more, is not sufficient for written description support in this case.

based protocol which does not utilize TCP at all). (*See generally* EX1038; EX1002 ¶158.)

A POSITA would not have understood that the disclosures in the '454 application limited to TCP embodiments would have been interchangeable with non-TCP embodiments.¹⁹ (EX1002 ¶159.) For example, a POSITA would have understood that a protocol that does not utilize TCP at all (like the UDP-based protocol noted in PO's infringement chart) would operate in a different environment with its own set of rules regarding at least (i) the setup of a connection between two nodes in a network, (ii) how the devices would communicate with each other, (iii) the packet structure used for communication, and (iv) detection of timeouts that would cause the connection to close. (EX1002 ¶159; EX1060, 1, EX1027, 1, EX1061, 1.) However, the '454 application does not provide any explanation regarding how its disclosed techniques for sharing idle time information in a TCP

¹⁹ Whether it would have been obvious to configure a TCP-based system such that it would operate in a non-TCP environment, as discussed above with respect to claim elements 1.d and 1.e, is irrelevant as a matter of law. *See Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997); *see also TurboCare Div. of Demag Delaval Turbomachinery Corp. v. GE*, 264 F.3d 1111, 1119 (Fed. Cir. 2001).

options field of a TCP packet during setup of a TCP connection would have extended to an altogether different environment with its own rules regarding connection setup, connection operation, packet structure, and timeout detection. (EX1002 ¶158.)

For example, nowhere does the '454 application describe (or inform a POSITA) how its disclosures limited to TCP embodiments may be extended to the non-TCP features like generating a packet for use in a protocol that is not TCP or a TCP extension (e.g., protocols for establishing UDP connections), as encompassed by the claim features set forth in some variation in claim 40. (EX1002 ¶160.) Thus, the '454 application does not provide written description support for the non-TCP features set forth in claim 40. (*Id.*)

Indeed, even the discussion in the reproduced portion above regarding “[o]ther message exchanges may be used in setting up a TCP connection as those skilled in the art will understand” and “[s]uch other exchanges are not currently supported by the TCP as described in RFC 793” (EX1038, 147 (¶[0076])) would have been understood to only disclose a TCP embodiment as this portion states that such exchanges would still “be used in setting up a TCP connection” (*id.*). Moreover, this portion also fails to disclose the other requirements with regards to the set up packet. (EX1002, ¶161.)

While the '454 application discusses that “[a]n equivalent or analog of an ITP header may be included in a footer of a protocol packet in **an extension**

and/or variant of the current TCP” (EX1038, 147 (¶[0080]), such extensions or variants are mentioned solely within the context of a TCP packet:

Those skilled in the art will recognize given this disclosure that an **ITP header** may have other suitable formats and **may be included in a TCP packet in structures and locations other than those specified for TCP options in RFC 793.** An equivalent or analog of an ITP header may be included in a footer of a **protocol packet in an extension and/or variant of the current TCP.**

(*Id.*, 147 (¶[0080]); EX1002 ¶89.)

Even if a TCP extension or variant as vaguely described here is encompassed by the non-TCP features, the scope of the non-TCP features encompasses protocols that do not utilize TCP at all (e.g., a UDP-based protocol), as discussed above. Thus, the scant description of a TCP extension or variant in the priority applications, even if considered to be within the scope of non-TCP, is not sufficient to satisfy the written description requirement because the full scope of the non-TCP features is not supported.²⁰

²⁰ Indeed, under PO’s interpretation, non-TCP features would encompass various other protocols (e.g., protocols based on XTP or IPX/SPX along with UDP-based protocols), none of which are described in the ’856 patent family disclosures, much

Thus, for the reasons above, the '454 application and the other applications in the priority chain sharing substantially similar specifications do not provide any support for the non-TCP features recited in claim 40 of the '856 patent. (EX1002 ¶167.)

2. Materials Incorporated by Reference in the Priority Applications Do Not Support the Non-TCP Features

The priority applications purport to incorporate U.S. Application No. 12/714,063 (“the '063 application”) (EX1041) and RFC 793 (EX1008). (*See, e.g.*, EX1038 ('454 application), 120 (¶¶[0001]-[0002]), 90 (IDS citing RFC 793); EX1002 ¶¶168-171.) However, the '063 application does not disclose the claimed

less in the context of the features set forth in the '856 patent claims. (EX1002 ¶163 n.22; EX1016, 1, 7-8.) In a proceeding involving the related '995 patent (EX1010), that issued from the '802 application, PO's declarant also confirmed that ‘non-TCP’ encompasses protocols “other than TCP” or protocols that are “not TCP.” (EX1029, 81:6-25 (“ . . . [I]n general, a person of ordinary skill in the art reading the specification would see that a non-TCP packet or a non-TCP connection was **something other than TCP**. It might be, for example, be a TCP-variant protocol **but it would be something that's not TCP**.”), 87:2-88:2 (“ . . . if it isn't TCP, it's non-TCP”).)

non-TCP features recited in claim 40 of the '856 patent. (*See generally* EX1041, 137-201; *see also* EX1042 (computer-generated redline comparing the '063 and '454 applications)) RFC 793 likewise does not describe the non-TCP features. (EX1002 ¶170; EX1008, 4; *see also* EX1002 170 n.23 (discussing EXS1056-1059).)

3. Mere Introduction of Non-TCP Type Terms In Summaries and Claims of Some Priority Applications Does Not Support the Non-TCP Features

Terms such as “non-TCP,” “different from TCP,” or “separate from TCP” started appearing in the summaries and claims of some of the priority applications, starting from the '802 application filed September 3, 2017. As discussed below, the introduction of such terms this way, without more, is insufficient for written description support here. The discussion below focuses on how the '802 application does not provide adequate written description support for the non-TCP features, as it is the earliest application in the priority chain where non-TCP terms were introduced (the other later filed applications in the priority chain are defective for similar reasons).²¹

²¹ Even if the '856 patent is entitled to a 2017 priority date based on the introduction of non-TCP type terms at that time (it is not), the references relied upon for Ground 1 (Morris and SIP) would still qualify as prior art with respect to the '856 patent. (*See supra* Section V.B.)

The '802 application introduced the non-TCP connection and non-TCP packet terms only (i) in its summary section of the specification and (ii) in the claims. (EX1044, 17-18 (¶¶[0012]-[0013]), 70-77; *see also id.*, 100 (substitute specification contains no new matter), 105-106 (¶¶[0012]-[0013]); EX1002 ¶173.) Indeed, other than the changes to the summary of the '802 application, the specifications of the '802 application and the earliest priority application, i.e., the '454 application, are substantially similar. (*See generally* EX1050 (computer-generated comparing the '454 and '802 applications)); *see also id.*, 2-5 (¶¶[0009]-[0017]).) (EX1002 ¶173.)

Notably, the introduction of the “non-TCP” terms in the summary section and claims of the as-filed '802 application simply replaces the term “TCP” with “non-TCP” but otherwise generally discloses and claims systems and methods similar to those disclosed in the earlier TCP-based applications. (*Compare, e.g.*, EX1044, 17-18 (¶¶[0012]-[0013]) (the new “non-TCP” embodiments in summary section) *with* EX1038, 122-123 (¶¶[0008]-[0009]) (the TCP embodiments disclosed in the pre-AIA '454 application); *compare* EX1044, 70-77 (the “non-TCP” claims) *with* EX1038, 100-106 (the TCP-based claims in the '454 application).) In other words, other than inserting the term “non-TCP” in the summary and claims of the '802 application, the '802 application includes **no explanation** regarding what is meant by “non-TCP” and how the disclosed techniques for sharing of information for

detecting an idle TCP connection could be applied to non-TCP protocols for establishing non-TCP connections using non-TCP packets. (EX1002 ¶174.)

Therefore, a POSITA would not have understood based on the disclosure of the '802 application that the named inventor of the '856 patent would have had possession of the subject matter set forth in claim 40 because the detailed description of the specification of the '802 application (which is substantially similar to the other priority applications as noted earlier) is exclusively focused on TCP-based connections and packets, as explained above in Section X.A.1. (EX1002 ¶175); *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1349-50 (Fed. Cir. 2010) (en banc) (“[A]n adequate written description of a claimed genus requires more than a generic statement of an invention’s boundaries.”) (citation omitted); *see also Fiers v. Revel*, 984 F.2d 1164, 1170 (Fed. Cir. 1993) (rejecting the argument that “only similar language in the specification or original claims is necessary to satisfy the written description requirement”); *LizardTech*, 424 F.3d at 1346 (explaining that a specification cannot always support expansive claim language and satisfy the

requirements of 35 U.S.C. § 112 “merely by clearly describing one embodiment of the thing claimed.”).²²

The only mention of the word “non-TCP” in the ’802 application specification is in the summary section, which spans two paragraphs. (EX1044, 16-18 (¶¶[0011]-[0012]).) The summary section, however, explicitly states that any disclosure in this section is a “simplified summary of the disclosure in order to provide a basic understanding to the reader” and that “it **does not** identify key/critical elements of the invention or delineate the scope of the invention.” (EX1044, 16 (¶[0009]).) It further states that “[i]ts **sole purpose** is to present some concepts disclosed herein in a simplified form as a prelude to the more detailed description that is presented later.” (*Id.*) Accordingly, the mere fact that two paragraphs in the summary section of the specification for the ’802 application refer to a “non-TCP connection” does not show that the named inventor had possession of the “non-TCP connection”

²² As noted above in Section X.A.1, whether the “non-TCP” terms encompass TCP extensions or variants is irrelevant because the ’856 patent disclosure must provide written description support for the full scope of these terms, which includes protocols that do not utilize TCP at all.

elements of the claimed invention at the time of the '802 application as 35 U.S.C. § 112(1) requires. (EX1002 ¶178.)

As these disclosures would be insufficient to disclose even verbatim claim language, they cannot support the claims in the '856 patent. *See also Driessen v. Sony Music Ent't*, 640 Fed. App'x 892, 896 (Fed. Cir. 2016) (“The mere presence of these words in isolation does not suffice to show that the ‘patentee had possession of’ . . . the claimed invention at the time of the application”) (citing *LizardTech*, 424 F.3d at 1345). As discussed above and further discussed below, far from describing the non-TCP features set forth in claim 40 in any detail, none of the disclosures of the '856 patent family even include language mirroring the language of claim 40 (which, in any case, would be insufficient for written description support). (EX1002 ¶180.)

The originally-filed claims of the '802 application reciting “non-TCP” features do not provide written description support for claim 40 of the '856 patent for similar reasons. (EX1002 ¶182.) In particular, they recite “non-TCP” features in the context of nodes connected via a “non-TCP” connection and exchanging information in “non-TCP” packets. (EX1044, 70-77.) However, the claims fail to provide any detail regarding any connections that do not use TCP. (EX1002 ¶182); *LizardTech*, 424 F.3d at 1345-47 (rejecting argument that an originally filed, and subsequently issued, claim reciting creation of a seamless discrete wavelet transform

(DWT) supported itself, noting that “[w]hile it is true that an originally filed claim can provide the requisite written description to satisfy section 112, . . . , nothing in [the original claim] or specification constitutes an adequate and enabling description of all seamless DWTs” because the patent specification “provide[d] only one method for creating a seamless DWT”). And as discussed above, other than generally mentioning the term “non-TCP” in the summary section, the ’802 application does not provide any explanation regarding how its disclosed techniques for sharing idle time information in a TCP options field of a TCP packet during setup of a TCP connection would have extended to an altogether different environment with its own rules regarding connection setup, connection operation, packet structure, and timeout detection. (EX1002 ¶182.)

Accordingly, nothing in the four corners of the specifications of the ’802 application and the later filed applications in the priority chain (including the ’554 application), which all share substantially similar specifications, demonstrates that the named inventor was in possession of the non-TCP-based features recited in claim 40. (EX1045, 84-86 (¶¶[0012]-[0013]), 137-144 (original-filed claims); EX1046, 168-173 (¶¶[0010]-[0013]), 221-226 (original-filed claims); EX1047, 229-234 (¶¶[0010]-[0013]), 220-225 (original-filed claims); EX1048, 30-34 (¶¶[0010]-[0013]), 83-88 (original-filed claims), EX1075, 208 (¶[0010]), 251-258 (original-

filed claims); EX1004, 211 (¶[0010]), 254-261 (original-filed claims).) (EX1002 ¶¶172-185.)

Notably, the first time the features set forth in claim 40 appeared in the '856 patent family was during prosecution of the '554 application (which issued as the '856 patent) by way of an Examiner's amendment entered May 4, 2021 in the Notice of Allowance, after the February 24, 2021 filing date of the '554 application. (EX1004, 7-48 (new claim 28 corresponding to issued claim 1 and new claim 67 corresponding to issued claim 40).)

Thus, the originally-filed disclosures of the '856 patent family, including the '856 patent itself, do not disclose the specific features set forth in claim 40. (EX1002 ¶185.) Accordingly, to the extent the '856 patent is entitled to any filing date, it is not entitled to an effective filing date earlier than February 24, 2021, i.e., the filing date of the '554 application.

4. Dependent Claims 41, 42, 48, 49, and 54 Are Not Supported

Claims 41, 42, 48, 49, and 54 depend from claim 40. Thus, they do not comply with the requirements of 35 U.S.C. § 112(a) for at least the reasons discussed above with respect to claim 40. (EX1002 ¶186.)

B. The '856 Patent and Its Priority Applications Do Not Provide Written Description Support For Detecting a Time Period During At Least A Portion of the First Connection Setup (All Challenged Claims)

Independent claim 40 recites:

based on detecting, as a function of the first duration and by the apparatus **during at least a portion of the first connection set up**, a first time period of the first type of time period, at least partially closing the first connection.

(EX1001, 31:33-37.)

That is, claim 40 recites features relating to (i) detecting a time period during a portion of the connection setup and (ii) at least partially closing the connection based on the detection (generally referred to herein as the “*time period detection during connection setup*” features). The *time period detection during connection setup* feature encompasses scenarios where the time period (e.g., a timeout) is detected and the connection is partially closed during the connection setup time. (EX1002 ¶188.) This is consistent with Patent Owner’s infringement contentions, which map the *time period detection during connection setup* feature to the accused product applying timeout parameters for an “idle timeout” from a previous connection to a new connection even before the new connection is established. (EX1032, 9-10 (“Remembered transport parameters [from a previous connection] apply to the new connection until the handshake completes.”), 23-24.)

But a POSITA would not have understood that the named inventor of the ’856 patent had possession of the claimed invention, including the *time period detection during connection setup* features set forth in claim 40 at the time the ’554 application was filed. (EX1002 ¶¶189-200.)

1. The '554 and '824 Applications Do Not Support the Time Period Detection During Connection Setup Features of Claim 40

A variation of the *time period detection during connection setup* features set forth in the challenged claims were introduced in the priority chain of the '554 application by way of the original claims presented in the '824 application filed January 14, 2021. (EX1075, 251-252.) For example, the original claims in the '824 application recited “in response to detecting, based on the first duration and by the first node during at least a portion of the first connection including at least a portion of the first connection setup, a first time period of the first type of time period, at least partially close the first connection”), 207-208 (similar language in summary section of specification).) (EX1002 ¶190.)

The '554 application, when filed on February 24, 2021, also included claims similar to the original claims from the '824 application. (EX1004, 191-197 (original claim 1), 201-202 (summary).) Then, by way of an Examiner's amendment entered with the Notice of Allowance on May 4, 2021, the originally filed claims were canceled and new claims were added to the '554 application which generally track the language of the issued claims of the '856 patent, including claim 40. (EX1004, 47-48 (new claim 28 corresponding to issued claim 1), 67-68 (new claim 67 corresponding to issued claim 40).).

However, the '554 and '824 applications, which share the same specification, do not provide written description support for the *time period detection during connection setup* features set forth in the challenged claims. (EX1002 ¶192.) The discussion below focuses on the '824 application as it is earlier in the priority chain, and provides corresponding cites to the '554 application which is similarly defective.²³

The '824 application discloses detection of time periods **after** a TCP connection is set up (established) for purposes of detecting idle time periods and closing such idle TCP connections. (EX1002, ¶193.) For example, like the priority applications, the '824 application discloses by way of its background that “there exists a need for methods, systems, and computer program products for sharing information for detecting **an idle TCP connection.**” (EX1075 ('824 application), 207 (¶[0008]); *see also* EX1004 ('554 application), 201 (¶[0008]); EX1048 ('267 application), 27 (¶[0008]); EX1047 ('811 application), 229 (¶[0008]); EX1046

²³ Notably, in response to a similar challenge by Petitioner regarding lack of written description support for these features in a related patent, PO disclaimed the challenged claims. (See EX1079, 2-3; EX1080, 57-68; EX1002 193 n.25 (citing EXS1055, 1076).)

(’522 application), 168 (¶[0008]); EX1045 (’047 application), 83 (¶[0008]); EX1044 (’802 application), 154 (¶[0008]); EX1039 (’402 application), EX1038 (’454 application), 122 (¶[0008]).) A POSITA would have understood that a “TCP connection” is only established **after two nodes exchange initial messages to set up the TCP connection.** (EX1002 ¶193; EX1075 (’824 application), 229 (¶¶[0075]-[0081]), 221-222 ((¶[0051]); EX1004 (’554 application), 223-224 (¶¶[0075]-[0081]), 215-216 (¶[0051]).)

The ’824 application discloses examples of timeouts in a TCP connection that may be modified based on the idle information shared during the connection setup. (EX1075 (’824 application), 226 (¶[0068]), 246 (¶[0119]); EX1004 (’554 application), 221 (¶[0068]), 240 (¶[0119]).) And while the ’824 application discloses that “[t]he specified ‘three-way handshake’ and other patterns of message exchange for setting up a TCP connection include packets that are considered to be in the TCP connection for purposes of this disclosure” (EX1075, 229 (¶[0081])), the ’824 application does not describe when its disclosed timeouts are detected and does not provide written description support for any detection of such timeouts and partial closure of the connection during the connection setup, let alone for a non-TCP protocol, as claimed. (EX1002 ¶194; EX1004, 223-224 (¶[0081]).)

As discussed below, a POSITA would have understood that these timeouts described by the ’824 application disclosure, such as the TCP keep-alive option,

TCP user timeout, and retransmission timeout, are initiated based on data being sent or received, and RFC 793 makes clear that data cannot be exchanged between nodes until after connection establishment (i.e., **after** the connection is set up). (EX1002 ¶195.) Thus, detection of any of these timeouts would occur only after the connection is established since data exchange would occur only after the connection is established. (*Id.*) A POSITA, therefore, would not have understood that the '824 application discloses the claimed invention, including the *time period detection during connection setup* features set forth in claim 40 at the time the '824 application (or the '554 application) was filed. (*Id.*)

In particular, the '856 patent family, including the '824 and '554 applications, rely on RFC 793 for TCP implementation details. (See, e.g., EX1075, 206 (¶[0004]), 221 (¶[0050]), 229 (¶[0075]), 230 (¶[0083]); EX1004, 200 (¶[0004]), 215 (¶[0050]), 223 (¶[0075]), 224-225 (¶[0083]).) RFC 793 discloses that “[w]hen two processes wish to communicate, their TCP’s **must first establish a connection.**” (EX1008, 9; see also *id.*, 31-32; EX1075, 229 (¶¶[0075]-[0080]).) RFC 793 discloses that data is sent or received between nodes after the TCP connection is established. (EX1008, 44 (“Once the connection is established data is communicated by the exchange of segments”).)

In other words, RFC 793 does not disclose detecting any time period during the time the TCP connection is being set up (e.g., during the time the messages in the three-way handshake are being exchanged). (EX1002 ¶¶196-197.)

Therefore, the as-filed '824 and '554 applications do not provide written description support for the *time period detection during connection setup* features. (EX1002 ¶¶190-198.)

2. The Priority Applications Do Not Support the Time Period Detection During Connection Setup Features of Claim 40

As discussed above, the disclosures of the priority applications (other than the '642 application) are substantially similar to each other. (*See supra* Section X.A.1.) Thus, they do not provide any additional explanation regarding the *time period detection during connection setup* features set forth in the challenged claims. (EX1002 ¶¶199-200.) Thus, claim 4 lacks written description support.

3. Dependent Claims 41, 42, 48, 49, and 54 Are Not Supported

Claims 41, 42, 48, 49, and 54 depend from claim 40. Therefore, claims 41, 42, 48, 49, and 54 do not comply with the requirements of 35 U.S.C. § 112(a) for at least the reasons discussed above with respect to claim 40. (EX1002 ¶201.)

C. Both The Non-TCP Features and The Detecting a Time Period During At Least A Portion of the Connection Setup Features Must Be Supported For Priority

To the extent the Board finds that the non-TCP features discussed in section X.A are properly supported and/or the time period detection during connection setup

features in section X.B are properly supported, the '856 patent would still not be entitled to priority unless both these features are properly supported working together as there is no support for a time period detection during the connection setup in a non-TCP connection. For the reasons stated above, that is not the case here.

XI. SIP IS A PRINTED PUBLICATION

SIP (RFC 3261) is a standards document published by the Internet Engineering Task Force (IETF), and is prior art under at least 35 U.S.C. § 102(a)(1) as it was published at least as early as July, 2002. The declaration of Sandy Ginoza, Director of the RFC Production Center at IETF, confirms SIP was published, disseminated, and reasonably available to the public by July, 2002. (EX1081, ¶¶1-3, 11.)

RFCs like SIP were at the time, and continue to be, Internet standards documents published and disseminated to the public by IETF through various media so that others may comment on them. (*Id.* ¶¶7-10.) Since 1998 (including 2002 and today), the IETF publishes an RFC on its public website, and publication announcements were sent to all subscribers of an IETF mailing list. (*Id.* ¶7.) Anyone could have subscribed to IETF mailing lists (EX1082, 2), and the archives of all IETF mailing lists are publicly available on IETF's website (EX1081, ¶7).

SIP was published by the IETF in July, 2002. (*Id.* ¶11.) In 2002, a POSITA could have learned about SIP in various ways, such as through announcements on

the IETF announce mailing list, searching the public website of the IETF where the uploaded documents were indexed, or review of the archives of the IETF announce mailing list. (*Id.*, ¶¶ 7-8, 11.) Collectively, this demonstrates that SIP was published and publicly available in 2002.

XII. THE RELATED LITIGATION PROVIDES NO BASIS FOR DISCRETIONARY DENIAL

The *Fintiv* factors do not justify denying institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential).

The **first factor** (stay) favors institution, as the parallel litigation is stayed pending resolution of IPRs of related patents. (EX1031, 3-4, 6; *see also generally* EX1030.) The Federal Circuit recently affirmed the Board’s decision finding all challenged claims unpatentable in one related IPR. *Jenam Tech, LLC v. Google LLC*, No. 2022-1085, slip op. at 2 (Fed. Cir. Apr. 11, 2023). In the remaining IPRs, the challenged claims have either been disclaimed by Jenam or found unpatentable by the Board. Jenam has appealed the final written decisions in those IPRs, and briefing is scheduled to commence in July, 2023. The Federal Circuit’s decisions in those appeals cannot be expected before early 2024, at the earliest. Thus, the status of the parallel litigation is unlikely to change at the time the Board issues its institution decision in this case (late 2023).

The **second factor** (proximity) favors institution as no trial date is set in the parallel litigation. (EX1033, 3.)

The **third factor** (investment) also favors institution. The district court case was in the early stages before it was stayed. The parties have not exchanged infringement contentions or invalidity contentions. Discovery has not begun and no claim construction has occurred. (EX1033, 3.)

The **fourth factor** (overlap) also favors institution. Given the related litigation will likely be stayed when the IPR trial will be instituted, and will likely be stayed through much of the course of the IPR trial, there is a low chance of any overlap of issues between this case and the related litigation. Moreover, the district court has indicated that it would receive the benefit of the PTAB's expertise and guidance regarding the other related IPRs, and it will similarly benefit from the PTAB's decisions in this case. (EX1033, 4 n.3.)

While the **fifth factor** (parties) may weigh slightly in favor of denial, because the Petitioner and PO are the same parties as in district court, based on a "holistic view," the factors favor institution. *Samsung Elecs. Co. Ltd. v. Dynamics Inc.*, IPR2020-00505, Paper 11 at 15 (P.T.A.B. Aug. 12, 2020).

The **sixth factor** also favors institution. Even if the Board determines that the above factors favor denial (which they do not), the Board should not discretionarily deny institution, because this petition presents compelling merits. See *Commscope*

Tech. LLC v. Dali Wireless, Inc., IPR2022-01242, Paper 23 at 4-5 (P.T.A.B. Feb. 27, 2023) (precedential). As discussed above, an earlier patent application (Morris) in the '856 patent's priority chain qualifies as prior art with respect to the '856 patent, and thus most of the claim features are undeniably taught by Morris. (*See supra* Sections IX-X.) And the proposed Morris-SIP combination is a straightforward combination of well-known features at the time of the alleged invention. (*See supra* Section IX.) Moreover, there is also a significant public interest against "leaving bad patents enforceable," and institution will further that interest. *Thryv, Inc v. Click-To-Call Techs., LP*, 140 S. Ct. 1367, 1374 (2020). This is especially true here given all challenged claims in PO's related patents have so far been either disclaimed or found unpatentable. (*See supra* Section II.B.3.)

XIII. CONCLUSION

For the reasons given above, Petitioner requests institution of IPR for the challenged claims based on each of the specified grounds.

Respectfully submitted,

Dated: May 18, 2023

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 11,050,856 contains, as measured by the word processing system used to prepare this paper, 13,794 words. This word count does not include the items excluded by 37 C.F.R. § 42.24 as not counting towards the word limit.

Respectfully submitted,

Dated: May 18, 2023

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that on May 18, 2023, I caused a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 11,050,856 and supporting exhibits to be served via express mail on the Patent Owner at the following correspondence address of record as listed on PAIR:

The Caldwell Firm, LLC
Patrick Caldwell (Reg. No. 44580)
G. Gordon (Reg. No. 64517)
P.O. Box 59655
Dept. SVIPGP
Dallas, TX 75229

A courtesy copy was also sent electronically to Patent Owner's litigation counsel listed below:

TD-PTAB@devlinlawfirm.com
ddahlgren@devlinlawfirm.com
dlflitparas@devlinlawfirm.com
1526 Gilpin Ave.
Wilmington, DE 19806

Respectfully submitted,

Dated: May 18, 2023

By: /Naveen Modi/
Naveen Modi (Reg. No. 46,224)
Counsel for Petitioner