

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION
Petitioner

v.

RAILWARE, INC.
Patent Owner

IPR2026-00133
Patent 9,517,782

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,517,782

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EXHIBIT LIST

Exhibit Number	Description
1001	U.S. Patent No. 9,517,782 (the “’782 Patent”)
1002	File History of U.S. Patent No. 9,517,782
1003	Declaration of Dr. Lori Kaufman including Curriculum Vitae (“Kaufman”)
1004	Vols. 1 and 2 of U.S. Department of Transportation, Federal Railroad Administration, <i>Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer</i> , Report Nos. DOT/FRA/ORD-04/13.i and DOT/FRA/ORD-04/13.ii (October 2004) (“FRA-Report”)
1005	PCT Publication No. WO 2007107554 A1 to Kruijswijk <i>et al.</i> (“Kruijswijk”)
1006	U.S. Patent No. 6,078,908 to Schmitz (“Schmitz”)
1007	PCT Publication No. WO 2010/012040 A1 to Macey (“Macey”)
1008	U.S. Patent No. 6,300,873 to Kucharczyk <i>et al.</i> (“Kucharczyk”)
1009	U.S. Patent No. 5,708,422 to Blonder <i>et al.</i> (“Blonder”)
1010	U.S. Patent No. 8,406,943 to Brand <i>et al.</i> (“Brand”)
1011	U.S. Patent No. 6,581,161 to Byford (“Byford”)
1012	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20050211025837/http://www.fra.dot.gov:80/us/content/412
1013	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20060922194521/http://www.fra.dot.gov/us/content/412

1014	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20080212192107/http://www.fra.dot.gov:80/us/content/412
1015	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20090320043352/http://www.fra.dot.gov/us/content/412
1016	Internet Archive Affidavit for URLs including EX1012-1015: https://web.archive.org/web/20050211025837/http://www.fra.dot.gov:80/us/content/412 https://web.archive.org/web/20060922194521/http://www.fra.dot.gov/us/content/412 https://web.archive.org/web/20080212192107/http://www.fra.dot.gov:80/us/content/412 https://web.archive.org/web/20090320043352/http://www.fra.dot.gov/us/content/412
1017	Excerpt of File History from U.S. Pat. RE49115
1018	Oral Argument Transcript regarding Wabtec’s Motion to Quash and Railware’s Motion to Compel held on March 26, 2025, before The Honorable Mark R. Hornak, Chief District Judge of the Western District of Pennsylvania. <i>See Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , Case No. 2:24-mc-01283-MRH, ECF No. 41 (W.D. Pa.).
1019	PCT Publication No. WO 2005/047074 A1 to Makkinga (“Makkinga”)
1020	US20120176217 to Tamaribuchi <i>et al.</i> (“Tamaribuchi”)
1021	U.S. Department of Transportation, Federal Railroad Administration, <i>Impact of Data Link Technology on Railroad Dispatcher Operations</i> , Report No. DOT/FRA/ORD-04/11 (October 2004) (“Malsch”)
1022	[RESERVED]
1023	[RESERVED]

1024	Railware’s Opening Claim Construction Brief, <i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , Case No. 2:24-cv-02963-JMY, ECF No. 40 (E.D. Pa. May 9, 2025).
1025	[Redacted] Declaration of Mehdi Ahmadian, Ph.D. in Support of Railware Inc.’s Claim Construction Submissions, <i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , Case No. 2:24-cv-02963-JMY, ECF No. 40-20 (E.D. Pa.).
1026	Defendant Southeastern Pennsylvania Transportation Authority’s Opening Claim Construction Brief, <i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , Case No. 2:24-cv-02963-JMY, ECF No. 39 (E.D. Pa. May 9, 2025).
1027	Excerpts from the Transcript of the March 28, 2025 Deposition of Medhi Ahmadian, Ph.D. as Part of Defendant Southeastern Pennsylvania Transportation Authority’s Opening Claim Construction Brief Submission (Exhibit 1017), <i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , Case No. 2:24-cv-02963-JMY, ECF No. 39-18 (E.D. Pa.).
1028	U.S. Department of Transportation, Federal Railroad Administration, <i>Communication and Coordination Demands of Railroad Roadway Worker Activities and Implications for New Technology</i> , Report No. DOT/FRA/ORD-07/28 (November 2007) (“Roth”)
1029	[RESERVED]
1030	<i>Railware v. Peninsula Corridor Joint Powers Board d/b/a Caltrain</i> (“Caltrain”), Case No. 5:25-cv-05725-BLF, ECF No. 1, Complaint (N.D. Cal. Jul. 8, 2025).
1031	<i>Railware v. Peninsula Corridor Joint Powers Board d/b/a Caltrain</i> (“Caltrain”), Case No. 5:25-cv-05725-BLF, ECF No. 15, Proof of Service (July 24, 2025).

CLAIM LISTING

(Including January 13, 2018 Certificate of Correction)

Claim Designation	Claim Language
Claim 1	
1[Pre]	A system to enhance railway control, to protect safety of railway workers on or near railway tracks, the system comprising:
1[A]	a railway control apparatus comprising a processor, a non-transitory medium storing one or more programs of executable instructions, and a network interface through which the railway control apparatus communicates via a network; and
1[B]	a user terminal provided to a railway field worker and configured to communicate via the network with the railway control apparatus and to provide a user interface to display information received from the railway control apparatus and to permit the railway field worker to respond to prompts displayed thereon,
1[C]	wherein the railway control apparatus, by execution of said one or more programs of executable instructions by the processor, includes: a block placing part to place a block on one or more specified track sections to permit the railway field worker to enter the track sections while blocking railway traffic to said track sections;
1[D]	a code generation part to generate a release code and transmit the release code to an electronic contact address accessible by the railway field worker via operation of the user interface of the user terminal; and
1[E]	a block removal part to remove only upon receiving the release code from the user terminal in return, the block placed by the block placing part on said one or more track sections.
Claim 2	
[2]	The system of claim 1, wherein upon the railway control apparatus placing the block of railway traffic to said one or more specified track sections and transmitting the release code to the electronic contact address accessible by the railway field worker, the user interface provided on the user terminal displays a message and permits the railway field worker to respond to the message to release the block.

Claim 3	
[3]	The system of claim 2, wherein upon the railway field worker responding to the message to release the block, the release code is returned to the railway control apparatus.
Claim 4	
[4]	The system of claim 2, wherein the message displayed by the user interface on the user terminal includes an embedded link for activating a return transmission of the release code to the railway control apparatus.
Claim 5	
5[Pre]	A method to enhance railway control, to protect safety of railway workers on or near railway tracks, said method comprising:
5[A]	configuring a mobile user device of a railway field worker to provide a device user interface to display information received via a network from a railway control apparatus and to permit the railway field worker to respond to prompts displayed thereon;
5[B]	providing a terminal user interface on a terminal to permit a terminal user of the terminal request the railway control apparatus to place a block on one or more specified track sections to permit a railway field worker to enter the track sections while blocking railway traffic to said track sections;
5[C]	generating by the railway control apparatus a release code and transmitting the release code to an electronic contact address accessible by the railway field worker via operation of the user interface of the user terminal; and
5[D]	permitting the block to said one or more track sections to be removed by the railway control apparatus only upon receiving the release code from the user terminal in return.
Claim 6	
[6]	The method of claim 4 ¹ , further comprising: displaying, upon the railway control apparatus placing the block of railway traffic to said one or more specified track sections and

¹ This change is based on the January 13, 2018 Certificate of Correction. EX1001, last page.

	transmitting the release code to the electronic contact address accessible by the railway field worker, a message through the device user interface provided on the mobile user device and permitting the railway field worker to respond to the message to release the block.
Claim 7	
[7]	The method of claim 6, further comprising: upon the railway field worker responding to the message to release the block, returning the release code to the railway control apparatus.
Claim 8	
[8]	The method of claim 2 ⁷² , wherein the message displayed by the device user interface on the mobile user device includes an embedded link for activating a return transmission of the release code to the railway control apparatus.

² This change is based on the January 13, 2018 Certificate of Correction. EX1001, last page.

MANDATORY NOTICES

Real Party-in-Interest – §42.8(b)(1)

Pursuant to 37 C.F.R. § 42.8(b)(1), Westinghouse Air Brake Technologies Corporation (“Wabtec” or “Petitioner”) is the real party-in-interest (“RPI”). Petitioner certifies that no other party exercised control or could exercise control over the filing of this petition or Petitioner’s participation in any proceeding instituted on this petition. Out of an abundance of caution, Petitioner names Peninsula Corridor Joint Powers Board d/b/a Caltrain (“Caltrain”) as an RPI.

Related Proceedings – §42.8(b)(2)

The following proceedings involve U.S. Pat. Nos. 9,517,782 (the “’782 Patent”), RE 49,115 (the “RE’115”), and/or RE 47,835 (the “RE’835”).³

	Case caption	Case status
1	<i>Railware, Inc. v. Peninsula Corridor Joint Powers Board dba Caltrain</i> , 3:25-cv-05725-BLF (N.D. Cal.) (“Caltrain litigation”)	Railware filed a Complaint on July 8, 2025 and served Caltrain on July 24, 2025. ECF Nos. 1, 15; EX1030-1031. Based on joint stipulations, Caltrain was given until October 8, 2025 to respond to the Complaint (ECF Nos. 19, 21, 23) and then filed a motion to dismiss and motion to stay discovery pending the motion to dismiss. ECF Nos. 31-32. The Case Management Statement with competing proposed schedules was filed on November 13, 2025 (ECF No. 46), and the Initial Case

³ The patents are related as claiming alleged priority to provisional no. 61/893,547.

		Management Conference is scheduled for November 20, 2025 before Judge Beth Labson Freeman. ECF No. 13.
2	<i>Railware, Inc. v. New Jersey Transit Corporation</i> , 1:24-cv-05537-MMG (S.D.N.Y.) (“NJT litigation”)	The Court on August 1, 2025 stayed the case, including NJT’s motion to dismiss (ECF No. 20), “pending the Supreme Court’s decision” in other cases regarding “[w]hether New Jersey Transit Corporation is an arm of the State of New Jersey for interstate sovereign immunity purposes.” ECF No. 42, 1-2 (quoting <i>Galette v. NJ Transit Corp.</i> , No. 24-1021, 2025 WL 1829160, at *1 (U.S. July 3, 2025); <i>NJ Transit Corp. v. Colt</i> , No. 24-1113, 2025 WL 1829162, at *1 (U.S. July 3, 2025)).
3	<i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , 2:24-cv-02963-JMY (E.D. Pa.) (“SEPTA litigation”)	Dismissed with prejudice. ECF No. 46 (June 23, 2025).
4	<i>Railware, Inc. v. National Railroad Passenger Corporation d/b/a Amtrak</i> , 1:22-cv-05013-KPF (SDNY) (“Amtrak litigation”)	Dismissed with prejudice. ECF No. 139 (June 27, 2024).
5	<i>National Railroad Passenger Corporation d/b/a Amtrak v. Railware, Inc.</i> , IPR2023-01179 (“-1179 IPR”) (challenging ’782 Patent)	Institution denied. Paper 8 (Jan. 22, 2024).
6	<i>National Railroad Passenger Corporation d/b/a Amtrak v. Railware, Inc.</i> , IPR2023-01180 (challenging RE’835)	Institution denied. Paper 8 (Jan. 22, 2024).
7	<i>National Railroad Passenger Corporation d/b/a Amtrak v. Railware, Inc.</i> , IPR2023-01181 (challenging RE’115)	Institution denied. Paper 8 (Jan. 22, 2024).

The following is a third-party proceeding involving Wabtec based on subpoenas issued by Railware from the SEPTA litigation:

	Case caption	Case status
1	<i>Railware, Inc. v. Southeastern Pennsylvania Transportation Authority</i> , 2:24-mc-01283-MRH (W.D. Pa.)	Wabtec filed a motion to quash and Railware filed a motion to compel Railware's subpoenas issued from the SEPTA litigation; dismissed on June 25, 2025 based on the SEPTA litigation dismissal. ECF No. 48.

Counsel – §42.8(b)(3) and (b)(4); Service Information; Fees

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A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b). The Office is authorized to charge the fee set forth in 37 C.F.R. § 42.15(a) or other fees to Deposit Account No. 22-0261.

Wabtec petitions under 35 U.S.C. § 312 and 37 C.F.R. § 42 for *inter partes* review of claims 1-8 (“Challenged Claims”) of U.S. Pat. No. 9,517,782 (the “’782 Patent”) (EX1001). The ’782 Patent is purportedly assigned to Railware, Inc. (“Railware”) and claims priority to an October 2013 provisional application.

The ’782 Patent relates to a centralized traffic control (“CTC”) system blocking a railway track for maintenance work, generating and transmitting a “release code” to a worker’s device, and thereafter the worker transmitting the same code to the CTC system to unblock the track. This simple back-and-forth transmission of the code, according to Railware (EX1018, 30:17-24), is the “crux of the inventive aspect.”

But, the ’782 Patent merely claims a ***known CTC blocking and unblocking system*** (*e.g.*, described in FRA-Report as explained herein) and ***adds a known code-based verification*** feature (*e.g.*, described in Kruijswijk, Schmitz, Macey, and Byford as explained herein), such as a one time code.

This is Wabtec’s first challenge of the ’782 Patent. Although the Board denied institution of a prior IPR⁴ of the ’782 Patent that relied on the FRA-Report, that prior

⁴ *National Railroad Passenger Corporation d/b/a Amtrak v. Railware, Inc.*, IPR2023-01179 (“-1179 IPR”).

IPR (i) was filed by a different petitioner (Amtrak) that is wholly unrelated to Wabtec and (ii) relied on FRA-Report in a different manner than Wabtec relies on herein. Significantly, Wabtec combines FRA-Report with described secret-code-based verification systems not previously considered and supported by recent Federal Circuit decisions. Indeed, this Petition shows that FRA-Report recognized that such a code system would have been implemented given its goals to [1] “improve roadway worker safety and productivity” (EX1004, Vol. I: Preface); [2] “positively identify the person communicating with the PDA by utilizing some form of password protection.” (*id.*, Vol. I: 57); and [3] implement “a verification system that prevent[s] or minimize[s] common human error.” *Id.*, Vol. I: 9, 27, iv.

Wabtec deserves to advance its own challenge, particularly where (i) Railware filed suit against Amtrak over three years before suing Caltrain (June 2022 vs. July 2025) and (ii) the Amtrak litigation was terminated over a year prior to Railware’s suit against Caltrain (June 2024 vs. July 2025).

Regardless, the Challenged Claims are unpatentable over the combination of such known disclosures as set forth herein.

I. GROUNDS FOR STANDING UNDER 37 C.F.R. § 42.104(a)

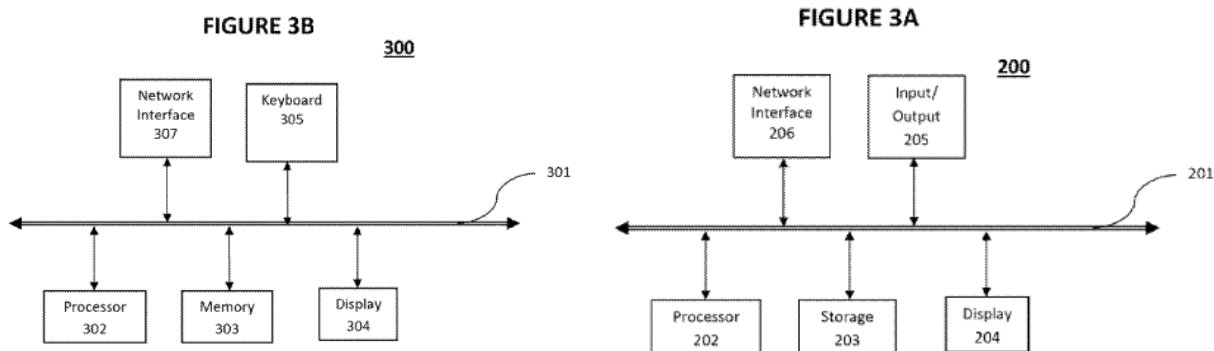
Petitioner is not barred or estopped from requesting this IPR. This petition is one of three petitions that Petitioner is concurrently filing.

II. THE '782 PATENT

A. Summary

The '782 Patent admits that the dispatcher provides railway control using known CTC system with a dispatcher-operated “control console” to control interlocks for blocking and unblocking tracks. EX1001, 1:25-2:26. Railware acknowledges the same. EX1025, ¶¶14, 22-23.

The '782 Patent describes that when a track is blocked, the CTC's generic computer—which is configured to operate as the claimed railway control apparatus—generates and transmits a “release code” to a worker's terminal. EX1001, 6:42-54, Fig. 3B, Fig. 4, 2:47-67, 1:21-2:26, Abstract. The known railway control apparatus (Fig. 3B) and worker's terminal (Fig. 3A) are below.



Id., Fig. 3B, 6:4-11, 6:42-7:20, Fig. 3A, 6:18-41, 9:2-5.

After the work, the worker transmits the same code to the railway control apparatus which unblocks the track. *Id.*, Abstract, 2:47-67, 3:8-25, Fig. 4; EX1003 (“Kaufman”), ¶¶79-84.

B. Prosecution History

The '782 Patent was filed on June 9, 2016, as Application No. 15/177,506 and claims an alleged priority to Application No. 14/519,727 (now U.S. Patent No. 9,403,545), which was filed on October 21, 2014, and provisional Application No. 61/893,547, which was filed on October 21, 2013. EX1001, front page; EX1002, 2-3.

The Examiner did not issue any substantive office action, instead issuing a notice of allowance to the as-filed claims 1-8. EX1002. A Certificate of Correction was issued on January 13, 2018. EX1001, last page; Kaufman, ¶¶85-86.

C. Priority Date

Petitioner assumes an alleged priority date of October 21, 2013 (the “Priority Date”), the date of the provisional application, but reserves the right to contest entitlement to this priority date. The '782 Patent was evaluated under the AIA (EX1002, p. 78), but pre-AIA or AIA does not change the below analysis.

III. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner submits that a Person of Ordinary Skill in the Art (“POSITA”) as of the Priority Date would have had at least a bachelor’s degree in electrical, mechanical, or related engineering, and at least two (2) years of experience in railway operations or railway control systems. A higher level of education or skill

might make up for less experience, and vice-versa. Railware offered in the dismissed SEPTA litigation a similar POSITA description. EX1025, ¶ 63; EX1024, 26.

Petitioner's expert, Kaufman, was a POSITA at the time of the Priority Date. Kaufman, ¶¶88-94.

IV. CLAIM CONSTRUCTION

Pursuant to 37 C.F.R. § 42.100(b), in *Railware, Inc. v. Southeastern Pennsylvania Transportation Authority*, Case No. 2:24-cv-02963-JMY (EDPA) ("SEPTA litigation"), the parties filed proposed constructions for Claim 5 (and certain dependent claims) of the '782 Patent (Claim 1 was not asserted there) but the case was dismissed prior to a *Markman* order. *Id.*, ECF 41; EX1024-1027.

Petitioner does not believe any claim terms require express construction for purposes of this IPR given the prior art disclosure herein. Nonetheless, Petitioner (i) has explained herein how the prior art satisfies even Railware's (and SEPTA's) proposed constructions in the SEPTA litigation as well as the Board's discussion of the claimed "release code" in the -1179 IPR and (ii) reserves the right to respond to any proposed constructions advanced by Railware in this proceeding.

A. “release code” (claims 1-8)⁵

Railware	SEPTA
“A code that is not readily available to the terminal user (<i>i.e.</i> , the dispatcher).” EX1024, 17, 18, 23, 19-21, 7; EX1025, ¶¶ 152, 148, 83, 113-114, 128-130.	Indefinite. EX1026, 23-24.

In the -1179 IPR, the Board noted, while not resolving Railware’s proposed construction (similar as above), that the specification fails to inform how a POSITA “would have distinguished a code that is ‘readily available’ to the dispatcher from a code that is not ‘readily available.’” IPR2023-01179, Paper 8, 20 n. 11 (Jan. 22 2024). Moreover, “not readily available” is absent from the ’782 Patent specification, and Railware compounds this issue when Railware’s expert contended in the SEPTA litigation that its construction is dependent on the subjective assessment of “whether the dispatcher can see or easily access the code....” EX1025, ¶154. Indeed, he acknowledged there are many unknowns or “parameters.” EX1026, 28; EX1027, 100:6-102:2.

While the Board in the -1179 IPR stated it was not construing release code, the Board did assess it as shown below:

⁵ Railware and SEPTA in their briefs list only certain claims. *See* EX1024, EX1026.

The '782 patent makes clear that the release code is “only” received by the relevant railway field worker and an internal storage ... Although the '782 patent describes alternative means for retrieving the release code from internal storage when the field worker is unavailable, accessibility to a “release code” is limited and this alternative access is only provided where “no maintenance worker [is] available to transmit the random secret code.” *See id.* at 10:19–22; *see also id.* at 5:58–60, 9:32–34, 9:65–10:5, 10:10–26 (consistently describing the release code as “secret”).

IPR2023-01179, Paper 8, 19-20 (citing EX1001) (internal citations omitted), n.3 (“no material difference” between release code and secret code); *Google LLC v. EcoFactor, Inc.*, 92 F.4th 1049, 1056 (Fed. Cir. 2024) (“found implicit claim constructions even when the Board does not recognize that it is construing a claim.”); Kaufman, ¶¶106-113.

B. “railway control apparatus” (claims 1-8)

Railware	SEPTA
“[n]o construction necessary or plain and ordinary meaning” EX1025, ¶183.	“centralized traffic control (CTC) console used by the train dispatcher” EX1026, 21.

Railware’s expert believes the term should be “broadly understood and encompasses a number of hardware (such as processor and memory components)

and software components beyond just the dispatcher’s console.” EX1025, ¶¶194, 200-201, 183-186, 192, 210, 223; Kaufman, ¶114.

C. “to respond to prompts displayed thereon” (claims 1, 5) and “to respond to the message to release the block” (claims 2, 6)

Railware	SEPTA
“do not need construction, or should be afforded their plain and ordinary meaning” EX1025, ¶301.	<p>Claim 5: “to respond through the mobile user device user interface to prompts displayed thereon”</p> <p>Claim 6: “to respond through the mobile user device user interface to the message to release the block” EX1026, 19-20</p>

Railware’s expert alleges this covers any “standard type of user interface ...” and “does not require that the response take any particular format or serve any particular purpose.” EX1025, ¶¶308, 313-314 (“broadly”), 321; Kaufman, ¶115.

D. “user terminal” (or “terminal”) (claims 1, 2, 4, 5)

Railware	SEPTA
“user terminal of a terminal user (<i>i.e.</i> , the dispatcher)” EX1024, 29; EX1025, ¶¶247-248, 266, 251, 259	“railway field worker’s mobile user device” EX1026, 6-7

Railware asserts that the “user terminal” in Claim 5 refers to the dispatcher’s terminal and Claim 1 refers to the worker’s terminal. EX1024, 41, 38. Thus,

Railware seeks to construe the same term differently in Claims 1, 5. Kaufman, ¶116.

E. “from the user terminal in return” (claims 1 and 5)

Railware	SEPTA
“[n]o construction necessary or plain and ordinary meaning” EX1025, ¶¶276-277, 279, 296, 321	“transmitted from the user terminal (as previously defined)” EX1026, 15-16.

Railware’s expert broadly asserts in Claim 5, “[g]iven the breadth of descriptions regarding how the removal or release code can be returned or transmitted ... the code can be returned in a number of different ways ...” and is not “limited to ... only via the user terminal of the railway field worker” EX1025, ¶¶287-288, 293-299; Kaufman, ¶117.

F. Remaining Claim Terms

The remaining claim terms should be given their plain and ordinary meaning.

V. IDENTIFICATION OF CHALLENGES (37 C.F.R. § 42.104(b))

Ground	Prior Art for Each Ground	Claims	Basis
1	FRA-Report (EX1004) and Kruijswijk (EX1005)	1-8	103
2	FRA-Report, Kruijswijk, and Macey (EX1007)	1-8	103
3	FRA-Report and Schmitz (EX1006)	1-8	103
4	FRA-Report, Byford (EX1011), and Macey	1-8	103

VI. OVERVIEW OF THE PRIOR ART

A. FRA-Report

Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer (“FRA-Report”) (EX1004) is a two-volume report that was published by the U.S. Department of Transportation, Federal Railroad Administration in October 2004. Volume I of FRA-Report (“Vol. I”) discusses the study from the perspective of the “Usability for the Roadway Worker” and Volume II (“Vol. II”) discusses the study as to the “Impact on Dispatcher Performance.” EX1004, Vol I: Title Page, Vol II: Title Page. This report was developed to support the development of data link (digital communications) technologies from the roadway worker perspective to improve their safety. Kaufman, ¶¶119-121.

FRA-Report was not considered during prosecution of the ’782 Patent. EX1002.

1. One Reference or Motivation to Combine

A POSITA would have understood FRA-Report to be a multi-volume publication that constitutes a single unified reference for the reasons below.

- They are stated as Vol. I and Vol. II with overlapping titles as shown above. Vol. II states that it is “*continuing development and evaluation of the [Vol. I] application*” EX1004, Vol. II:

3 (emphasis added), Abstract (“This report is the second in a series”) (emphasis added), ix, 5 (same), 72.

- Both FRA-Report volumes are published by the U.S. Department of Transportation, FRA. EX1004, Vol. I and Vol. II: cover page.
- Both FRA-Report volumes were published with the same report number (“DOT/FRA/ORD-04/13.” with a “i” and “ii”) and on the same date of October 2004. EX1004, Vol. I and Vol. II: Report Documentation Page, Boxes 2 and 10.
- Both FRA-Report volumes share overlapping authors. EX1004, Vol. I, Vol. II: Report Documentation Page, Box No. 6.
- A POSITA accessing FRA-Report publicly would have found them together as shown below.

Federal Railroad Administration

Research Reports

Reports are listed by their corresponding report numbers starting with the most recent published document. Click on the "Report Number" for a pdf copy of the report, if available. Additionally, all these reports are also available to the U.S. public through the [National Technical Information Service](#) in Springfield VA.



RESEARCH & DEVELOPMENT (R&D;) REPORTS	
REPORT NUMBER	TITLE
DOT/FRA/ORD-04/13.i	Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer: Volume I - Usability for the Roadway Worker
DOT/FRA/ORD-04/13.ii	Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer: Volume II - Impact on Dispatcher Performance

See e.g., EX1012, 1.

- Both volumes are in the field of, and solve the problem of, railway control for safe maintenance work and both have substantially similar network architecture. EX1004, Vol. I: Abstract, 1, 6, 14 (Fig. 2), 29, 37-38; Vol. II: Abstract, ix, 3, 5, 10-12, 16 (Fig. 4).

Thus, the two volumes should be considered one reference. *VirnetX Inc. v. Apple Inc.*, No. 2022-1523, 2023 WL 6933812, at *3 (Fed. Cir. 2023) (“two documents thus serve in effect as two volumes of a single instruction manual”). Nonetheless, there are numerous reasons above a POSITA would have combined the two volumes with a reasonable expectation of success. Kaufman, ¶¶122-124.

2. Accessible to Interested Members of the Relevant Public

FRA-Report is prior art under at least AIA 35 U.S.C. § 102(a) without any § 102(b) exceptions. FRA-Report was accessible to interested members of the relevant public: “This document is *available to the public* through the National Technical Information Service, Springfield, VA 22161. This document is also available on the FRA website at www.fra.dot.gov.” EX1004, Vol. I; Vol. II: front page (emphasis added), Report Documentation Page (“12a. Distribution/Availability Statement”), notice page (“disseminated”).

Also, the Internet Archive confirms FRA-Report was available at www.fra.dot.gov in, for instance, 2005, 2006, 2008, and 2009 and under “Research

Reports.” EX1012-1015 (*see* “DOT/FRA/ORD-04/13.i” and “DOT/FRA/ORD-04/13.ii”); EX1016 (Internet Archive affidavit for the websites in EX1012-1015). A POSITA would have visited the FRA from 2005-2009 to review research reports, including FRA-Report, to keep updated on current information. Kaufman, ¶¶125-127.

3. Overview

FRA-Report describes a CTC system that, upon a railway worker’s request from a mobile phone (PDA), blocks the track to “protect[] the roadway worker since it prevents the dispatcher from routing trains on that track” (EX1004, Vol. I: 6, 11-14) because “the dispatcher temporarily loses authority over that track” to the worker. *Id.*, Vol. II: 12. FRA-Report refers to a worker’s request to block a track as, *e.g.*, a “Form D” request. *Id.*, Vol. I: 7-8, 14, 55-56. The CTC system will transmit information to the worker, such as “Form D number (automatically assigned by system), Form D recipient, date, direction of travel” *Id.*, Vol. I: 38.

After performing any work, the worker selects on the mobile phone “the links [or prompts] ‘Cancel/Fulfill’ or ‘Clear’ to give some track *under his authority back to the dispatcher.*” *Id.*, Vol. I: 36-37 (emphasis added), 32 (Fig. A-1), 6; Vol. II: 12. Thus, the worker controls blocking and unblocking of the track from the mobile device. Kaufman, ¶¶128-147.

B. Kruijswijk

PCT Pub. No. WO 2007/107554 A1 (EX1005, “Kruijswijk”) published on September 27, 2007 and is therefore prior art under at least AIA 35 U.S.C. § 102(a) without any § 102(b) exceptions. Kruijswijk was not considered during prosecution of the ’782 Patent. EX1002.

Kruijswijk discloses a system used for railway safety, that involves a generated, transmitted, and returned “secret code” by a railway worker for identity verification. EX1005, Abstract, 12:9-21 (worker “safety checks”).

Kruijswijk teaches “generating, at the server station, the personal secret code, e.g. a random number” *Id.*, 8:14-16, 3:30. The secret code is transferred over a network such as the Internet to a “railroad track ... technician[.]” *Id.*, 12:13-21, 13:25-28, 1:11-17, 3:29-34, 8:21-25. Thereafter, the railway worker “transfer[s] a message containing the personal secret code . . . to the server station” which verifies it with the saved code. *Id.*, 2:8-13, 6:1-9, 11:8-17, Abstract; Kaufman, ¶¶152-161.

C. Schmitz

U.S. Patent No. 6,078,908 (EX1006, “Schmitz”) issued on June 20, 2000, and is thus prior art under at least AIA § 102(a) without any § 102(b) exceptions. Schmitz was not considered during prosecution of the ’782 Patent. EX1002.

Schmitz discloses a data transmission system for verifying the relevant person’s identity using a secret password or code, including for controlling access

to a secured location. EX1006, 1:37-2:7, 2:39, 2:57-3:5, 5:7-48. Schmitz teaches that, upon the relevant person's request, an "authentication computer [server] 2 generates the transaction authorization number TAN or the comparable password" using "a random number generator 5" *Id.*, 6:63-7:4, 8:19-21, 5:58, 2:57-3:5, Abstract, Fig. 2.

The server transmits this code over the Internet to the relevant person. *Id.*, 2:21-24, 3:3-18, 5:3-6, 6:63-7:4, 7:54-65, Abstract. Thereafter, the code "is transmitted again to the authorization computer 2" or server which "verifies" the code to control access to a lock or "physical access controls." *Id.*, 7:4-15, 5:7-9, 5:24-31, 7:60-61; Kaufman, ¶¶336-348.

D. Macey

PCT Pub. No. WO 2010/012040 (EX1007, "Macey") published on February 4, 2010, and is therefore prior art under at least AIA 35 U.S.C. § 102(a) without any § 102(b) exceptions. Macey was not considered during prosecution of the '782 Patent. EX1002.

Macey discloses a system for enhancing railway worksite safety that involves comparing a secret code transmitted by a railway worker before a train is allowed to proceed through the worksite. EX1007, 16:1-21, 1:5-8. Macey describes that a railway worker must enter "a specific code before it is deemed the target zone 108 is safe for the passage of the vehicle." *Id.*, 16:1-21, 13:35-14:4. This code is "only

known to the [worker]....” *Id.*, 15:22-35. The worker must transmit this code to a central system to unblock the track, *e.g.*, changing “a red light [blocked track] to a green light [unblocked track] and signals the operator of the train to proceed.” *Id.*, 20:31-37, 15:28-35; Kaufman, ¶¶299-310.

E. Byford

U.S. Patent No. 6,581,161 (EX1011, “Byford”) issued on June 17, 2003, and is thus prior art under at least AIA § 102(a) without any § 102(b) exceptions. Byford was not considered during prosecution of the ’782 Patent. EX1002.

Byford discloses a system for “controlling access to a secure location” by generating and transmitting a secret code to the relevant person. EX1011, 4:31-38, Abstract. Byford teaches a server generating a “cipher lock code” for the relevant person and transmitting the code in “encrypted form” over the Internet to the relevant person’s wireless device which “decrypt[s]” it. *Id.*, 4:31-38, 3:61-4:3, Abstract, 5:7-14, 5:25-30, claims 1, 3; Kaufman, ¶¶400-408.

F. Analogous Art

Under two separate tests, “same field of endeavor” or “reasonably pertinent to the particular problem with which the inventor is involved,” each prior art reference is analogous art. *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019) (citations and quotations omitted).

Each reference is in the same field of endeavor of workers, railway work, or access control as the '782 Patent. EX1001, title, Abstract, 1:14-2:3, 2:43-3:7, 4:32-36. Railware's expert's description of '782 Patent likewise supports this and any purported problem as discussed below. EX1025, ¶¶20 (“control traffic over a railway track section when a railway worker is working on or near the track section”), 54, 57; EX1024, 6, 13-14.

- ***FRA-Report and Macey***: relate to workers, railway work, and access control. EX1004, Vol. I: 6, 36-37, Abstract, 32 (Fig. A-1); Vol. II: 10-12, 18-20, Abstract; EX1007, 15:22-35, 16:1-21, 13:35-14:4, 20:31-37; Section VI.A, D; Kaufman, ¶¶128-147, 299-310.
- ***Kruijswijk***: relates to workers and railway work as teaches confirming railway workers performed “repair of a railroad track” (or “safety checks”) by generating, transmitting, and returning a “secret code” by the railway worker for identity verification. EX1005, 12:13-21, Abstract, 3:29-34, 8:14-25; Section VI.B. A POSITA would have understood also that Kruijswijk is a form of access control because it verifies the railway workers' location. *Id.*; Kaufman, ¶¶152-161.
- ***Schmitz***: relates to access control given it provides a non-exhaustive list of fields of application, such as “computer centers” and “security regions” (EX1006, 5:35-48), for employing, *e.g.*, “access controls” of a user to a region (*id.*, 5:7-9, 5:24-33). *Id.*, 9:23-24 (“user obtains full access to or access limited to specific regions ... only after authorization.”), 5:12-18;

Section VI.C. A POSITA would have understood that Schmitz would have been applied to railway work (e.g., “computer centers,” “security regions”) and the reference to a “user” would have encompassed workers. Kaufman, ¶¶336-348.

- **Byford:** relates to access control given its “invention is concerned ... [with] controlling access to a secure location” EX1011, Abstract, Title, 1:7-11 (“secured area”), 4:59-62. A POSITA would have understood that Byford would have been applied to railway work (e.g., “secured location” or “secured area”) and Byford’s reference to a “user” would have encompassed workers. Section VI.E; Kaufman, ¶¶400-408.

Alternatively, each reference is reasonably pertinent to any purported problem addressed in the ’782 Patent, namely, of controlling or authorizing access to a location or a region, such as by workers or railway traffic. EX1001, title, Abstract, 1:14-2:3, 2:43-3:7, 4:32-36; EX1025, ¶ 20; EX1024, 6, 13-14.

The Federal Circuit construes pertinent art broadly—for example, analogous art for a “a treadmill with a folding mechanism” includes “any area describing hinges, springs, latches, counterweights, or other similar mechanisms—such as the folding bed in Teague.” *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1380 (Fed. Cir. 2007). Thus, under *ICON*, FRA-Report, Macey, Kruijswijk, Schmitz, and Byford are reasonably pertinent art, including that they are in several “area[s]” underlying the purported problem for the reasons discussed above. Moreover, the

numerous reasons (discussed below) for combining these references with FRA-Report reinforce the analogous art of such references. *See infra, e.g.*, Sections VII.A.1,C.1,D.1 at e-f; Kaufman, ¶¶128-147, 152-161, 299-310, 336-348, 400-408.

VII. SPECIFIC GROUNDS

A. Ground 1: Claims 1-8 Are Obvious Over FRA-Report and Kruijswijk

1. Independent Claims 1, 5

a. 1[Pre], 5[Pre]⁶

FRA-Report discloses 1[Pre], 5[Pre].

Whether or not the preamble is limiting, FRA-Report discloses a system and method for enhanced railway control to protect the safety of railway workers on or near tracks because it teaches a worker blocking and unblocking a track from a mobile device. EX1004, Vol. I: Preface (“This report documents the design and evaluation of a digital communication device intended to improve roadway worker safety and productivity.”), 2; Vol. II: Abstract.

Railway workers operating a user terminal (or PDA) interface request track protection or to block the track, *e.g.*, Form D, from the CTC system. EX1004, Vol.

⁶ The Claim Listing provided herein identifies the correspondence between claim limitations and designation labels.

I: Abstract (“[a] prototype communications device was developed for roadway workers ... to request track protection from the dispatcher.”), 29, 32 (Fig. A-1) and 34 (Fig. A-3), 37; Vol. II: 16-17 (requesting “work authorization”), 18-20.

Thereafter, “[w]hen a *dispatcher [grants] a request for roadway worker protection* the *track is placed off-limits (blocked) for other uses*. In *Central Traffic Control (CTC)* territory, *blocking a track protects the roadway worker since it prevents the dispatcher from routing trains on that track.*” *Id.*, Vol. I: 6 (emphasis added), 1; Vol. II: 12 (“[o]nce a track is blocked, the dispatcher temporarily loses authority over that track.”), 10-11.

Thereafter, the “worker can retrieve a list of Form Ds ... under his/her authority ... [and] [f]ollowing the link[] ‘Cancel/Fulfill’ ... the roadway worker is able to give some track under his authority back to the dispatcher [CTC].” *Id.*, Vol. I: 36, 37, 6, 14 (Figs. 2), 32 (A-1), 34 (A-3), 29; Vol. II: 12, 10-11; Kaufman, ¶¶162-166.

b. 1[A]

FRA-Report discloses 1[A].

FRA-Report discloses a railway control apparatus or CTC dispatcher’s console or computer (e.g., processor, non-transitory medium or storage), database, and web and query servers with associated database, as shown below in the boxes, to communicate with railway workers.

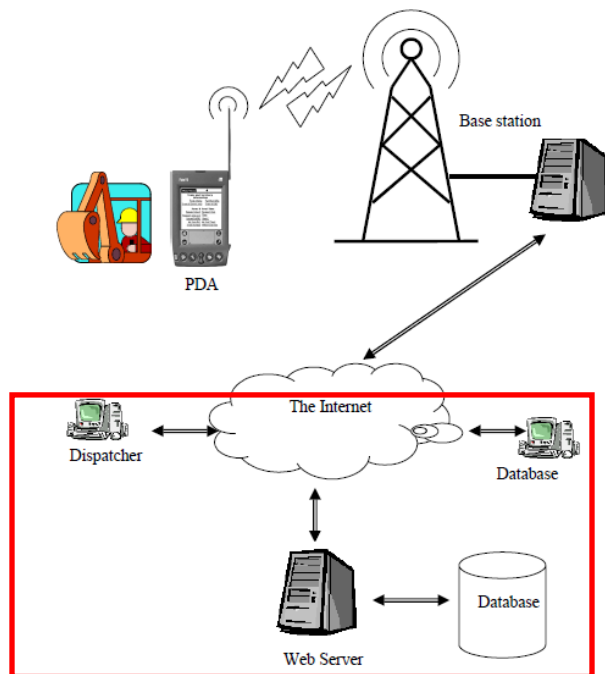


Figure 2. PDA System Architecture

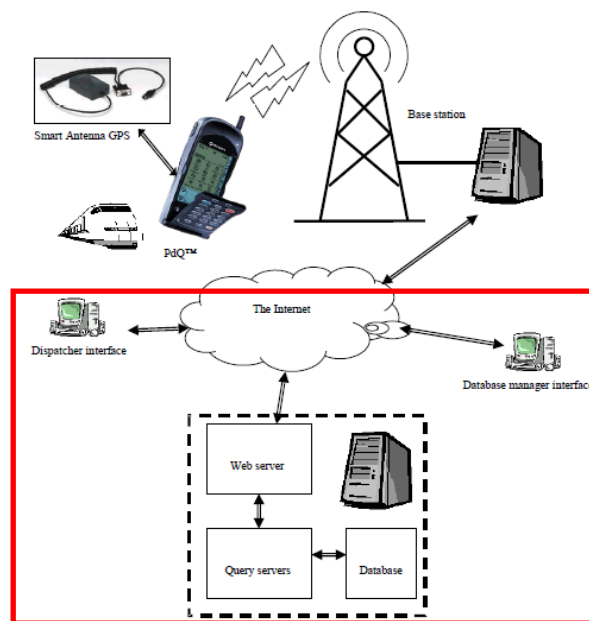


Figure 4. System Architecture

EX1004, Vol. I: 14 (Fig. 2, annotated), 13, 31, 36-39, 1, 6; Vol. II: 16 (Fig. 4, annotated), 43-46; 1[Pre], 5[Pre] (CTC control). The dispatcher’s computer, web server, and query server each have a processor and a non-transitory medium such as a hard drive or other storage for storing one or more programs of executable instructions. *Id.*

The dispatcher “communicate[s] with the roadway worker through the computer aided dispatch (CAD) system.” EX1004, Vol. II: 18. Specifically, “[e]ach dispatcher has a workstation to control the switches and signals,” including “[a]t the Traffic Control Center, the dispatcher could use the track display to protect the track segment [or block the track] in question using software that controlled various switche[s] and signals in the field.” *Id.*, Vol. II: 10-11, 11 (Fig. 1 and Table 2); Vol. I: 1 (“switches and signals receive commands from the dispatcher’s computer.”), 14

(Fig. 2) (showing dispatcher and other computers), 31 and 36 (“dispatcher’s terminal”; query server and web server described as a “computer”), 36 (“query servers ... mainly written in Java (Sun Microsystems, 2001) ... [A] Common Gateway Interface (CGI) script ... reads the HTML forms as sent by the PDA ... and returns the requested information to the PDA.”), 38-40, 32-40 (Figs. A-1-A-5), 12 (Fig. 1).

Figure 1 below illustrates the dispatcher operating a track display with a plurality of railways and interlocks to control blocking (blue: “protected for use”) and unblocking (white: “cleared”) of the tracks.

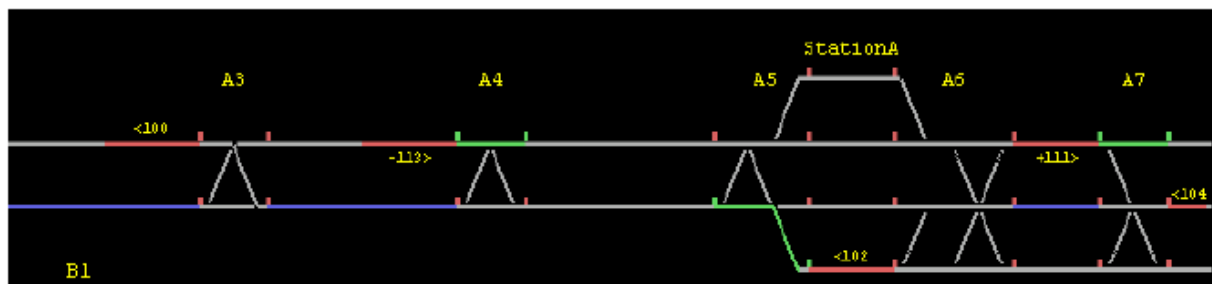


Figure 1. Track Chart Display

Table 2. Representation of Color Code for Monitoring Track Status

Color	Meaning
White	Indicates that the track segment is available for routing trains or other uses.
Red	Means train or track vehicle occupancy. A train currently occupies that block.
Green	Indicates that the track segment has been cleared (authorized for use) for train movement. The train has not yet entered this block.
Blue	Indicates that a track section is authorized for track maintenance. This means that a portion of track has been protected for use by maintenance of way crews or track equipment. When the dispatcher gives track authority to a work crew, the dispatcher temporarily loses control over that section of track. Trains cannot enter this track segment unless authorized by the roadway worker responsible for that block.

Id., Vol. II: 11 (Fig. 1 and Table 2); Vol. I: 40 (Fig. A-5) (discussing another dispatcher interface that a POSITA would have combined with the above interface or use separately).

Indeed, the '782 Patent concedes it was known for a CTC system to control interlocks, block and unblock a track, in a railway network from a dispatcher's console. EX1001, 1:25-2:3. Railware even contends the below 2010 public document, which is before the Priority Date, shows a "control center where dispatchers control train traffic using a CTC system."



EX1025, ¶¶ 14, 22-23.

FRA-Report further teaches that the railway control apparatus includes a network interface through which it communicates via a network (*e.g.*, “Internet” in Figures 2 and 4) with the worker’s PDA, such as for work authorization. *See supra* p.24 (discussing Figures 2 and 4); EX1004, Vol. I: 14 (Fig. 2 (“Internet”)), 13 (“[T]he server redirected the message to the appropriate destination via the Internet.... A number of servers look for requests sent by the PDA, the dispatchers, or a database manager.”), 37 (dispatcher query server responds to “requests sent by the PDA” such as “work permissions and answers sent by dispatcher to the PDA”), 11, 1, 36. Additionally, because the dispatcher is remotely controlling switches and signals, the railway control apparatus would have had a network interface that is used to communicate with the signals and switches.

Accordingly, FRA-Report discloses (and it was known to a POSITA) 1[A]. Given the foregoing, FRA-Report discloses 1[A] under Railware’s construction of a railway control apparatus, which is “broadly understood and encompasses a number of hardware ... software components beyond just the dispatcher’s console,” given FRA-Report discloses a dispatcher’s console or computer and even other hardware and software (such as the database and servers) to control track blocking and unblocking. *See supra* pp.10-11.

Additionally, FRA-Report discloses SEPTA’s construction of a railway control apparatus because FRA-Report teaches a CTC “console used by the train

dispatcher” for, *e.g.*, blocking and unblocking tracks. *See supra* p.10. Regardless, a POSITA would have understood that FRA-Report teaches SEPTA’s construction because it is simply a design choice for the dispatcher’s console to contain the software and hardware to perform the railway control apparatus functionality. Kaufman, ¶¶167-184.

c. 1[B], 5[A]

FRA-Report discloses 1[B], 5[A].

FRA-Report teaches the railway worker operates a user terminal (PDA or smartphone) which communicates via a network with the railway control apparatus for work authorization or to block the track. *See* 1[Pre], 5[Pre], 1[A]; EX1004, Vol. I: 13 (“[T]he PDA sent and received information to a web server.... A work authorization was sent to the dispatcher while an information request was answered by the system”), 29 (“The PDA also enabled the roadway worker to request a variety of work authorizations (Form D and Foul Time).”), 11.

FRA-Report teaches the railway control apparatus and worker communicate via a network or Internet. Figures 2 and 4 referenced above show two-way communication between the worker’s user terminal and the railway control apparatus via a network (Internet). EX1004, Vol. I: 14 (Fig. 2), 13 (“[T]he server redirected the message to the appropriate destination via the Internet....”), iii (“Internet”), 31; Vol. II: 16 (Fig. 4). In fact, the worker’s “device was selected that

had wireless access to the Internet, and could be used anywhere along the track.” *Id.*, Vol. I: 13; 1[Pre], 5[Pre], 1[A] (discussing Internet communication).

FRA-Report discloses that the railway worker’s mobile device provides a user interface that displays information including prompts, Figure A-1 e.g., “Main Menu,” “My Form D’s,” “My Foul Time,” “Clear,” and “Cancel/Fulfill,” “You own these form Ds 0003 ... and the form D # 0003 has been cancelled,” among many others, received over the network from the railway control apparatus.

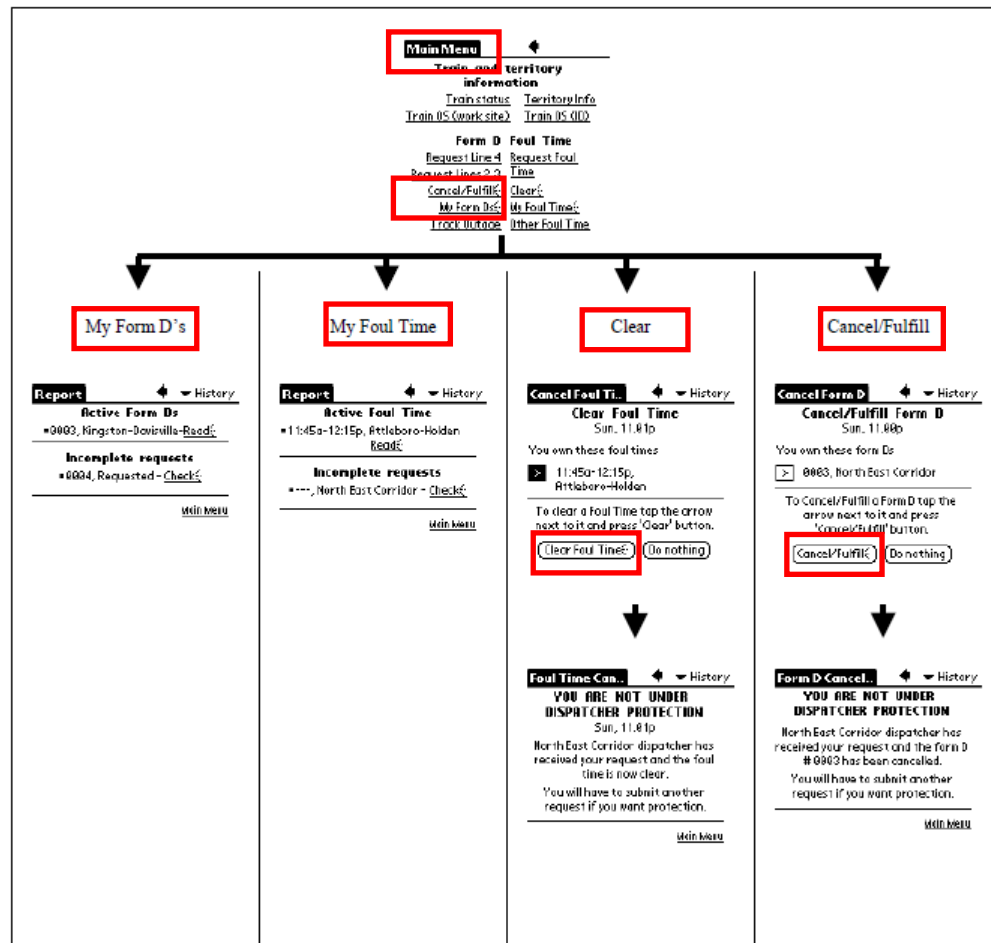


Figure A-1. PDA Screen Shots (1)

EX1004, Vol. I: 32 (Fig. A-1 (annotated)), 31 (“**Web server**. This server hosts the master files that are used as templates to send information back to the PDA.”) (emphasis in original), 36 (“The query servers ... read[] the HTML forms as sent by the PDA ... and returns the requested information to the PDA”).

As another example, in Figure A-3 below, the railway control apparatus displays information including prompts on the worker’s interface, such as “Ask time Eff”, “Cancel Form D”, or “Check Response” buttons, “North East Corridor dispatcher has received your request . . .” (emphasis removed), and “2 track out of service between/at Providence and Lawn in charge of Oriol.”

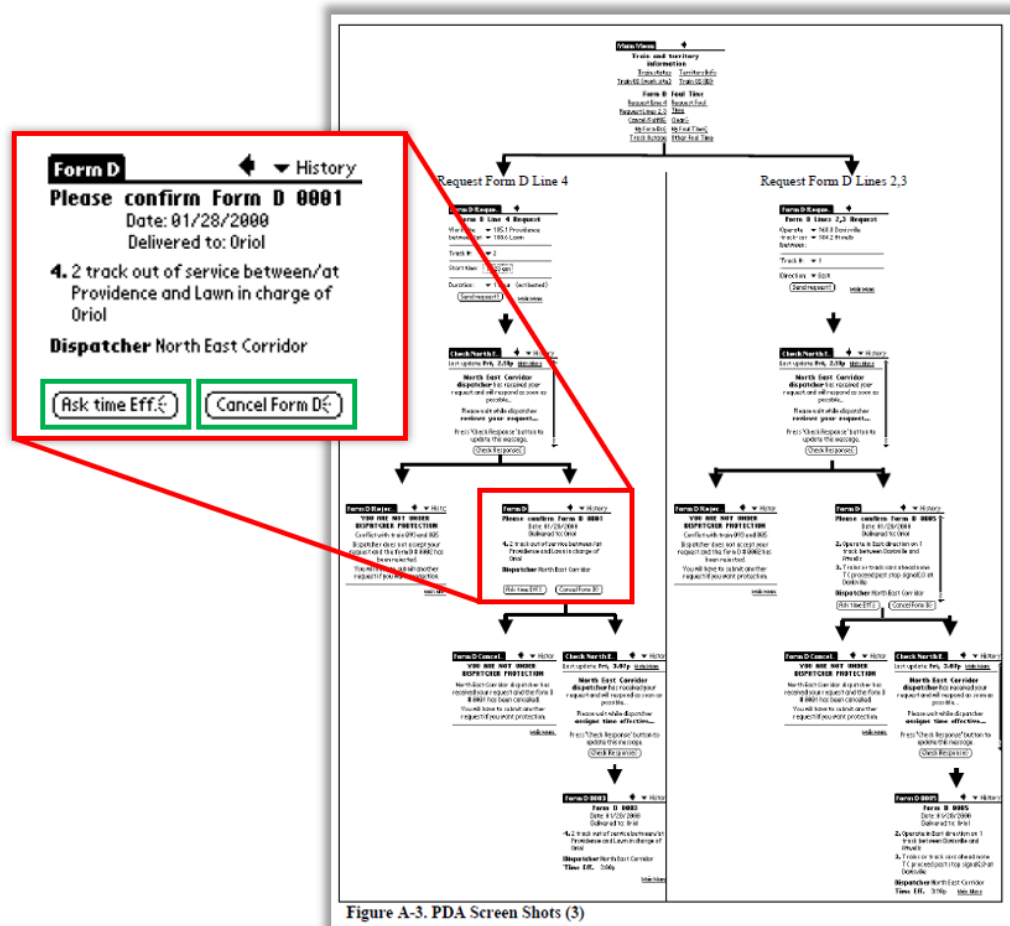
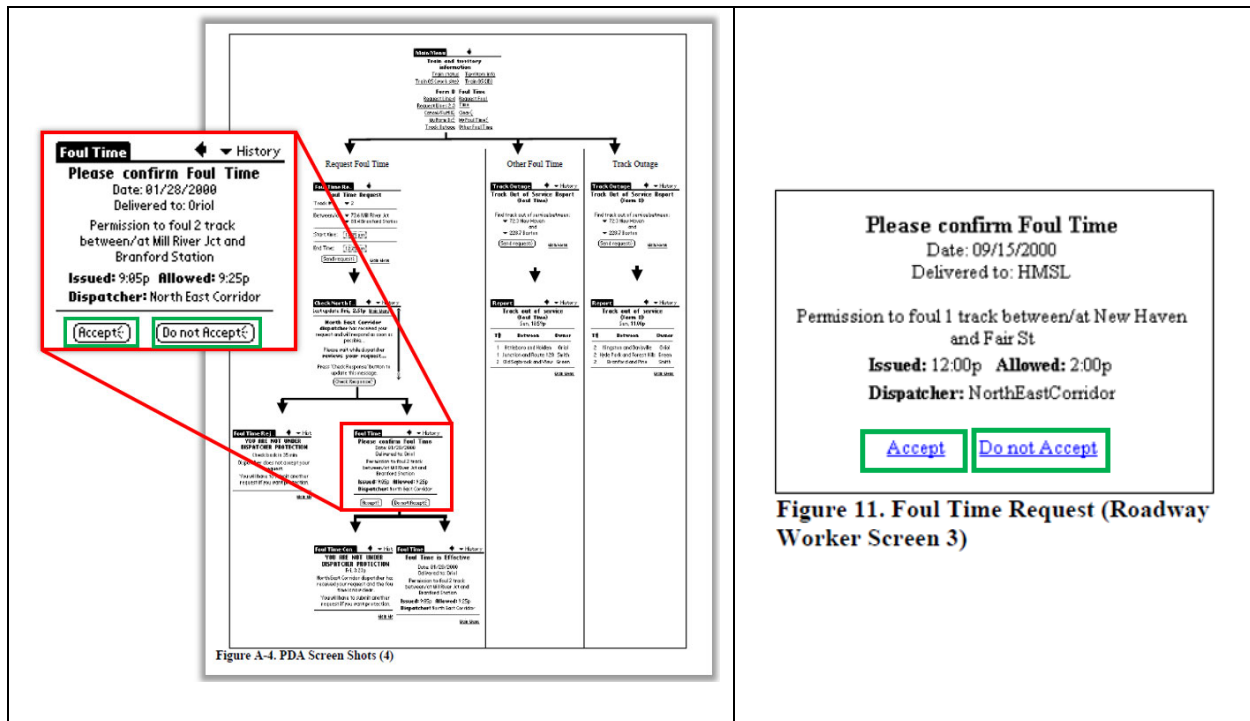


Figure A-3. PDA Screen Shots (3)

Id., 34 (Fig. A-3, annotated).

As a further example in Figure A-4 below, the railway worker may be prompted from the railway control apparatus to accept or not accept foul time.



EX1004, Vol. I: 35 (Fig. A-4, left annotated); Vol. II: 20 (Fig. 11, right annotated), 19.

The worker operating the PDA’s user interface—as shown in, *e.g.*, Figures A-1 and A-3-A-4 above—responds to prompts displayed thereon such as: **Fig. A-1**: “Cancel/Fulfill” or “Clear (“Clear Foul Time”) button or link and “My Form Ds” link; **Fig. A-3**: “Ask for Time Effective” or “Check Response” or “Cancel Form D” buttons; or **Fig. A-4**: “Accept” button, among others, while requesting blocking and unblocking a track for work. EX1004, Vol. I: 27 (“[b]efore giving any section of

track back to the dispatcher, the system should prompt the roadway worker for confirmation.”), 36 (“Following the links ‘Cancel/Fulfill’ or ‘Clear,’ the roadway worker is able to give some track under his authority back to the dispatcher.”), 32 (Fig. A-1), 34 (Fig. A-3), 16 (Fig. 4), 37, 11; Vol. II: 19, 18, 20-21.

Accordingly, FRA-Report discloses 1[B], 5[A]. Given the foregoing, FRA-Report discloses 1[B], 5[A] under Railware’s broad construction of “to respond to prompts displayed thereon” as any “standard type of user interface” and SEPTA’s construction to respond to the prompts displayed on the worker’s device. *See supra* p.11; Kaufman, ¶¶185-202.

d. 1[C], 5[B]

FRA-Report discloses 1[C], 5[B].

Claim 1, unlike Claim 5, recites a block placing part (1[C]), code generation part (1[D]), and block removal part (1[E]). The ’782 Patent discusses implementing the parts “such as via computer hardware, software, or combination ...” EX1001, 2:47-49, 2:58-67, 6:42-45. FRA-Report discloses implementing these three parts in software and/or hardware via the railway control apparatus’ processor. *See* 1[A]; EX1004, Vol. I: 14 (Fig. 2), 31, 36-39, 40 (Fig. A-5).

FRA-Report discloses that the “dispatcher would communicate with the roadway worker through” the CAD system. EX1004, Vol. II: 18; *see* 1[A]. The CAD system includes software that allows the dispatcher to remotely control the tracks

via switches and signals using keyboard and mouse commands. *See* 1[A]; EX1004, Vol. II: 11-12, 28 (“The dispatcher can view the track on two monitors and can allocate track to trains, and track equipment or roadway workers using a variety of keyboard and mouse commands.”); Vol. I: 1.

Specifically, FRA-Report discloses that a worker may request via a link on the worker’s mobile device interface to block the track, which “prevents the dispatcher from routing trains on that track.” *See* 1[B], 5[A]; EX1004, Vol. I: 6, 32 (Fig. A-1), 34 (Fig. A-3), 29, 37, 1; Vol. II: 10-12. For instance, the worker selects a Form D work authorization link on the PDA interface, such as “Request Form D Line 4” or “Request Form D Lines 2, 3” in Figures A-1 or A-3 and transmits such work authorization to the railway control apparatus. EX1004, Vol. I: 16 (Fig. 4), 37 (“**Requests sent by PDA:** Request Form D line 4: ... to perform a work that will require a Form D line 4 authorization.”) (emphasis in original), 29, 37 (“**Dispatcher Query Server.** Handles requests sent by the PDA that need dispatcher interaction such as requests that have to do with work permissions and answers sent by dispatcher to the PDA”) (emphasis in original), 32 (Fig. A-1), 34 (Fig. A-3); *see* 1[Pre], 5[Pre]; 1[B], 5[A].

Thereafter, that once the work authorization is received, FRA-Report teaches a dispatcher with a track display or terminal user interface via the railway control

apparatus to place a block on one or more specified track sections. *See* 1[A] (shown in blue).⁷

In particular, based on the worker’s Form D request—or request to block the track—the railway control apparatus’ processor executes a block placing part (software / hardware) to block the track, also denoted as “out of service” for maintenance.

Answer request for Form D line 4: *Used by a dispatcher to grant or deny the requested Form D lines 4. If the dispatcher grants the Form D, the appropriate information will be sent to the roadway worker* who requested it ... [such as] Form D number (automatically assigned by system) ... foreman in charge *of the track out of service*.

EX1004, Vol. I: 38 (emphasis added), 36-37, 6 (“When a dispatcher receives a request for roadway worker protection [and if] the dispatcher grants permission to work, (under Form D) the track is placed off-limits (blocked) for other uses.”).

⁷ Railware and SEPTA apparently agree that “terminal user” in Claim 5[B] refers to the “train dispatcher” EX1026, 13.

This block placing part software/hardware is also shown in Figure A-3 where the railway control apparatus blocks a track based on a work authorization request, particularly “*Form D Request Line 4 ... Send Request ... North East Corridor dispatcher has received your request ... 2 track out of service* between/at Providence and Lawn in charge of Oriol.” *Id.*, 34 (Fig. A-3) (emphasis added).

While the track is blocked (colored in blue on the track display in Figure 1, *supra* p.25), the worker can enter the track to perform, *e.g.*, maintenance work, because the worker—not the dispatcher—has authority over the track. EX1004, Vol. II: 11 (“Blue ... [which means the] track has been protected [T]he *dispatcher temporarily loses control over that section of track.*”) (emphasis added), 12; Vol I: 32 (Fig. A-1), 34 (Fig. A-3: track “out of service” until worker cancels it), 6 (“blocking a track protects the roadway worker since it prevents the dispatcher from routing trains on that track.”); 1[E], 5[D]; Kaufman, ¶¶203-219.

e. 1[D], 5[C]

FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C].

FRA-Report teaches that a worker transmits a work authorization or request to block the track from the PDA’s interface. *See* 1[C], 5[B]. Thereafter, the dispatcher in the track display via the railway control apparatus: blocks the track, generates a Form D number, and transmits that number and other information (*e.g.*, track related) to the worker’s PDA or electronic contact address.

If the dispatcher grants the Form D [blocks the track], the *appropriate information* will be *sent to the roadway worker who requested it*. This information includes *Form D number* (automatically assigned by system), *Form D recipient*, date, track number, track location, and foreman in charge of the track out of service.

EX1004, Vol. I: 38 (for “Form D line 4”) (emphasis added), 34 (Fig. A-3) (“Delivered to: Oriol”); *see* 1[A] (dispatcher’s track display); 1[C], 5[B].

The worker’s PDA includes an electronic contact address because the Form D number and other information above are “sent to the roadway worker who requested it” and the worker’s PDA device ID is registered in the railway control apparatus database. EX1004, Vol. I: 39 (“The database includes ... Roadway workers (MWForemen.txt). Includes information about registered PDAs and their owner.”), 57 (“Each Palm VII device had a built in device ID [and this] device ID was used to identify which roadway worker was sending each request.”), 13 (“querying the database” to respond to work authorization); *see* 1[A].

Additionally, it would have been known to a POSITA that the PDA includes electronic addresses, *e.g.*, a MAC address, device ID, or IP address, and that some or all of that information would have been stored in the railway control apparatus’ database.

The Form D and other information transmitted by railway control apparatus to the worker’s electronic contact address is accessible by the worker’s user terminal

(PDA) interface. *See* 1[B], 5[A] (displays information on worker’s interfaces); EX1004, Vol. I: 34 (Fig. A-3) (“Form D Line 4 Request ... North East Corridor dispatcher has received your request ... Please confirm Form D 0001 ... Delivered to: Oriol ... 2 track out of service between/at Providence and Lawn in charge of Oriol”), 32 (A-1).

As mentioned, Claim 1 (unlike Claim 5) recites a code generation part (1[D]). A POSITA would have understood that the hardware (*e.g.*, processor) and software used to place a block would have included corresponding hardware and software to generate the code below or code generation part given the railway control apparatus CAD system controls switches and signals to block and unblock the track. *See* 1[A]; 1[C], 5[B]; Kaufman, ¶¶220-226.

i. FRA-Report and Kruijswijk Combination

FRA-Report discloses that the dispatcher operates the track display (or another interface) via the railway control apparatus to block the track and generate and transmit information (*e.g.*, track-related) to the worker’s electronic contact address accessible by the worker’s PDA interface. *See* 1[C], 5[B]; 1[D], 5[C].

Kruijswijk supplies the “release code” such that the dispatcher in FRA-Report operates the track display via the railway control apparatus and blocks the track as well as generates (code generation part: software and/or hardware) and transmits the

“release code” (as taught in Kruijswijk) to a worker’s electronic contact address accessible by the worker’s PDA interface.

Specifically, Kruijswijk teaches “generating, at the server station, the personal secret code” such as “a random number,” and “cryptographical methods may be applied” based on user data. EX1005, 8:14-20, 3:29-34. “Subsequently the personal secret code is transferred” by the server to the “railroad track ... technician,” *e.g.*, mobile phone (such as SMS, email), over the network or Internet. EX1005, 8:21-25, 12:13-21 (worker “safety checks”), 11:8-17, Abstract, 13:25-28, 5:3-6, 3:29-34.

Thus, FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C]. Given the foregoing, they also disclose these limitations under the Board’s prior discussion of the term “release code” (*see supra* pp.9-10): [a] Kruijswijk describes its code as a “secret code” and only received by the relevant worker; [b] to ensure secrecy, the code can be “terminate[d]” after “a one-time use”; and [c] the relevant worker transmits the secret code to the server, and the server verifies the relevant worker as part of “safety checks” after track maintenance is performed. EX1005, 12:13-21, 4:3-8, 9:8-10, 6:1-9 (“verifying that a code entered indeed is the personal secret code of the respective user.”), 7:1-17.⁸

⁸ Kruijswijk discusses in a separate embodiment the secret code “may” be shared between workers, and Railware contends this is a secret code. EX1030, ¶89 (“after

Likewise, FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C] under Railware’s construction of a “release code” or a “code that is not readily available to the terminal user (*i.e.*, the dispatcher)” for the above reasons [a]-[c] given the code taught in Kruijswijk is secret or “not readily available” to the dispatcher. Further, Kruijswijk teaches a secret code as Railware’s expert states that, “any method of generating the string of symbols to serve as the Code Terms would be within the scope of the inventions.” EX1025, ¶¶163, 166; EX1024, 28.

Additionally, FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C], including under the Board and Railware’s understanding of release code, given a POSITA would have had a motivation to combine and reasonable expectation of success to implement Kruijswijk as a release code or secret code in FRA-Report for two reasons.

First, generating and transmitting a secret code, *e.g.*, for safety and security, only received by the relevant worker was taught (or known) before the Priority Date.

both the RWIC and one authorized person . . . has entered a special pin code”). Significantly, Kruijswijk describes above the code as “secret” and several other embodiments teach a “secret code” only known to the relevant worker. EX1005, 3:29-34, 9:27-10:4, 8:14-35, 6:1-9, 7:1-17; Kaufman, ¶230 n.4.

EX1008, Abstract (“one-time use access code ... may be issued by a server ... [and] may be generated using a cryptographically strong random number generator”), 7:30-42 (“every access code issued by server 30 ... will be unique to the requester. ***That requester, and only that requester, will know the access code***”) (emphasis added), 9:41-44; EX1007, 15:22-35 (“specific code” is “only known to the” railway worker), 20:25-37; EX1009, 13:66-14:8 (“generates a confirmation code and supplies that code to the customer” where the code is “randomly generated” and “will be known only to the” relevant person), 15:7-27; EX1011, 4:31-38 (server generating a “cipher lock code” for the relevant user), 5:7-14 (user permitted “one-time access”), 3:61-4:3, Abstract, 5:25-30.

Thus, it would have been obvious to try in implementing Kruijswijk as the claimed release code or secret code in FRA-Report based on Federal Circuit 2025 cases. *U.S. Well Servs., LLC v. Stewart*, No. 2023-1796, 2025 WL 485252, at *1 (Fed. Cir. Feb. 13, 2025) (based on prior art and expert testimony, a POSITA would “have found it obvious” to modify the reference to the “claimed switchgear configuration”) (citation omitted); *Xerox Corp. v. Snap, Inc.*, No. 2023-1967, 2025 WL 1135689, at *3 (Fed. Cir. Apr. 17, 2025) (claim limitation met based on what “a skilled artisan would have understood” the prior art teaches) (quotations omitted).

Second, there were known problems and motivations in the art which would have predictably led a POSITA to implement Kruijswijk as the claimed release code

or secret code in FRA-Report. *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed. Cir. 2023) (“*It’s enough for Intel to show that there was a known problem ... in the art ... Nothing more is required* to show a motivation to combine”) (emphasis added). These include for instance: [a] the problem of protecting railway workers from removal of a block while the worker performed maintenance work which would have driven a POSITA to use a secret code only known by the relevant worker; [b] a worker operated a mobile device to take and return control of a work zone from a central system and as such, a code only known by the relevant worker would have been obvious to try; and [c] a one-time code only received by the relevant party for authentication and thus, a POSITA would have applied such a code to railway systems to ensure a track block is not removed.

Accordingly, FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C]. Given the foregoing, FRA-Report and Kruijswijk disclose 1[D], 5[C] under Railware’s construction of “user terminal” as a dispatcher’s terminal in Claim 5 because, as discussed above, the dispatcher operates a computer to block the track as well as generate and transmit the release code to a worker’s PDA interface. For the same reasons, they teach SEPTA’s construction in Claim 5 and both parties’ construction in Claim 1 as the worker’s terminal. *See supra* pp.11-12; Kaufman, ¶¶227-239, 57-78.

ii. *Motivation to Combine FRA-Report and Kruijswijk with a Reasonable Expectation of Success*

A POSITA would have had a motivation to combine with a reasonable expectation of success such that the dispatcher operates the track display via the railway control apparatus and blocks the track as well as generates and transmits the “release code” (as taught in Kruijswijk) to a worker’s electronic contact address accessible by the worker’s PDA interface given Kruijswijk and FRA-Report involve railway technology and worker safety. *See* Sections VI.A.3, B, F.

Given CTC systems and secret-code verification systems were known, modifying FRA-Report with the code taught in Kruijswijk would have been simply “the application of a known technique to a known device ready for improvement to yield predictable results” which are “recognized rationales.” *Samsung Elecs. Co. v. Fendgo, LLC*, IPR2024-00113, Paper 31, at 37-38 (May 5, 2025) (citations omitted); *supra* pp.26, 39-41, Sections VI.A.3, B-F. Indeed, FRA-Report recognized that a secret-code system would have been implemented in the FRA-Report (*see supra* p.5) and the prior art discusses that technologies would have been applied to augment worker safety. EX1028, 4 (“potential exists to develop portable roadway worker devices that combine technologies”); EX1015, 1 (citing EX1028 in March 2009).

A POSITA would have been further motivated by the FRA-Report’s goals to “improve roadway worker safety and productivity” (EX1004, Vol. I: Preface) and implement a “verification system.” *Id.*, 9, 27 (“Before giving any section of track

back to the dispatcher, the system should prompt the roadway worker for confirmation.”), iv; 1[B], 5[A]; *Honeywell Int’l Inc. v. 3G Licensing, S.A.*, 124 F.4th 1345, 1356 (Fed. Cir. 2025) (“Philips reference’s disclosed goal ... provided the motivation for the claimed modification.”) (citation omitted). A POSITA would have thus recognized, to prevent the dispatcher from erroneously revoking a blocked track, that FRA-Report would implement a “handshake” or verification protocol where the code taught in Kruijswijk is associated with the blocked track and transmitted to the worker who later unblocks the track with the same code. This would have enhanced the prior worker and dispatcher two-way radio communication. EX1028, 14-15.

Notably, FRA-Report recognized the need “to positively identify the person communicating with the PDA by utilizing some form of password protection.” EX1004, Vol. I: 57. FRA-Report even proposes various solutions including (i) a “device ID” to be sent with messages and/or (ii) “password-protected access to the system” such as a “personal password.” *Id.*, 57-58. Therefore, FRA-Report urges a readiness to implement robust verification measures (including password-based ones) to effectively verify roadway worker identities, and Kruijswijk teaches one such solution in the railway maintenance field.

A POSITA would have appreciated that modifying FRA-Report with Kruijswijk would have had a reasonable expectation of success. FRA-Report built

and tested—nine years before the Priority Date—a railway worker and dispatcher CTC system containing a server(s) with software and worker mobile device. 1[A]; 1[C], 5[B]; 1[D], 5[C]; 1[E], 5[D]. FRA-Report notes that “[t]he system is designed to be highly configurable.” EX1004, Vol. I: 41, Vol. II: 15, 21, 27, 41, 63; EX1021; EX1028. With such hardware and software, the FRA-Report would have had flexibility when the code is generated, such as before or after the block is placed, depending on the needs for the system.

Other references reinforce the reasonable expectation of success given that, for example, Kruijswijk was published in 2007 and Macey was published in 2010, which both involve a worker using a mobile phone and code in a railway system. EX1005, 8:14-25, 12:13-21, 11:8-17, Abstract, 13:25-28, 5:3-6, 3:29-34; EX1007, 15:16-35, 20:31-37, 16:1-21, 13:35-14:4. This shows that a code was implemented in railway systems. Also, from October 2004 to before the Priority Date technology evolved, and it would have been a predictable design choice for a POSITA to apply those capabilities to augment FRA-Report with a code-based system.

The POSITA would further have been motivated to modify FRA-Report with a reasonable expectation of success for the worker’s interface to receive and display the release code taught in Kruijswijk given the worker’s existing user interfaces in the FRA-Report and it is a design choice by a POSITA. *See* 1[B], 5[A].

Alternatively, a POSITA would have been motivated to modify FRA-Report

to transmit the code taught by Kruijswijk with a reasonable expectation of success to the worker's electronic contact address through other methods, including text message or email message given such methods would have provided an alternate form to the worker and were well-known. EX1004, Vol. II: 15, 21, 27, 63; EX1017, 15-16. As another option, the text and email message would have included an embedded link to activate the return of the code. Kaufman, ¶¶240-251, 57-78.

f. 1[E], 5[D]

FRA-Report and Kruijswijk disclose and render obvious 1[E], 5[D].

FRA-Report describes that the “worker can retrieve a list of Form Ds ... *under his/her authority* ... [and] [f]ollowing the *link[] ‘Cancel/Fulfill’* ... the *roadway worker is able to give some track under his authority back to the dispatcher.*” EX1004, Vol. I: 36 (emphasis added), 37 (same: “Retrieve list of active Form Ds: ... Cancel/fulfill Form D”) (emphasis in original), 39, 31, 32 (Fig. A-1); *see* 1[B], 5[A].

This is also shown in Figure A-1, particularly “*You own these form Ds 0003, NorthEast Corridor ... Cancel/Fulfill ... Form D Cancel ... YOU ARE NOT UNDER DISPATCHER PROTECTION NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled* [track unblocked].” EX1004, Vol. I: 32 (Fig. A-1) (emphasis added).

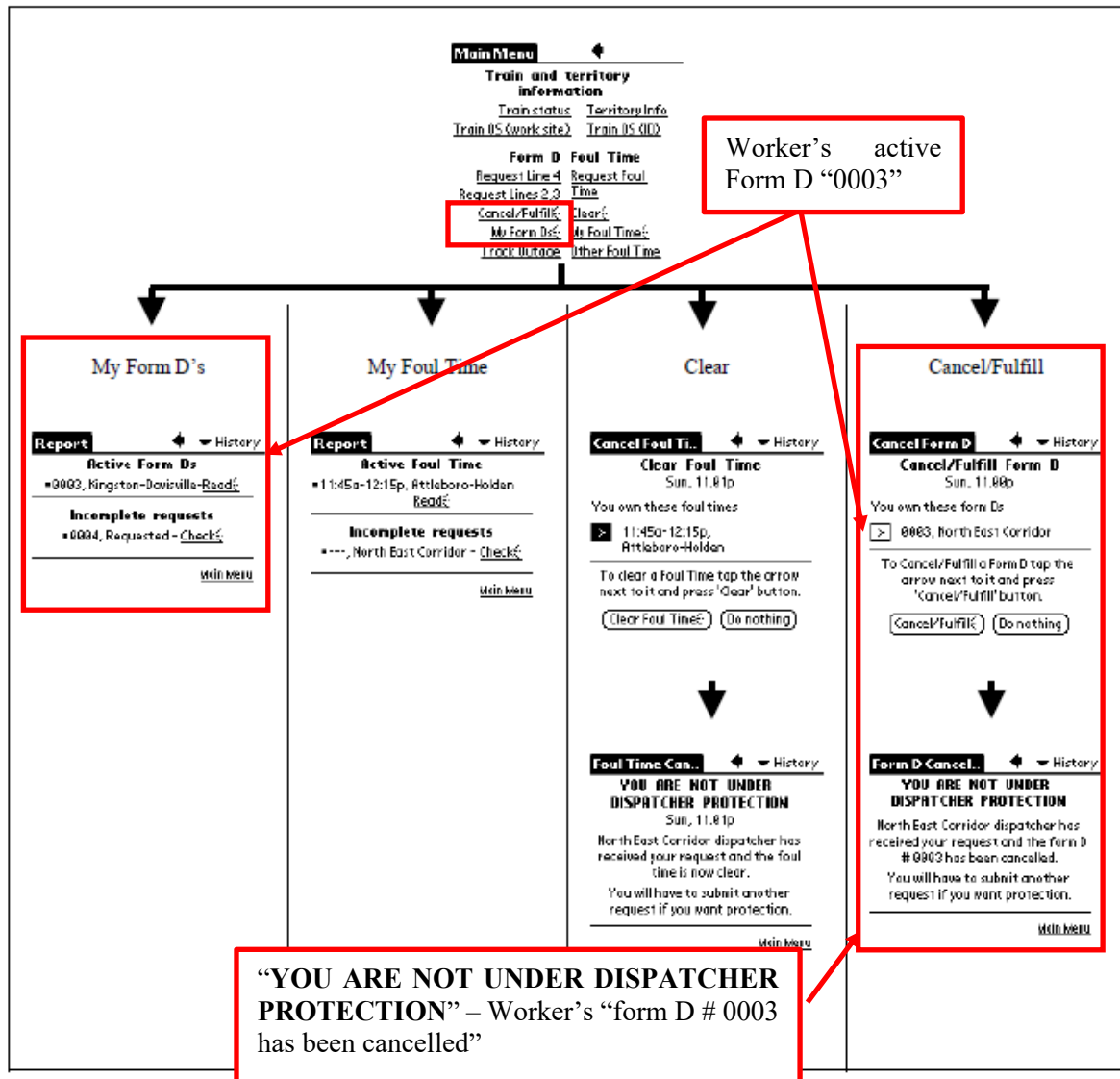


Figure A-1. PDA Screen Shots (1)

Id. (annotations added).

Claim 1, unlike Claim 5, recites a block removal part (1[E]). A POSITA would have understood that the hardware and software used to place a block would have included corresponding hardware and software to remove the block or block removal part given the railway control apparatus CAD system controls switches and signals to block and unblock the track. *See* 1[A]; 1[C], 5[B]; Kaufman, ¶¶252-256.

i. FRA-Report and Kruijswijk Combination

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway control apparatus block removal part (software and/or hardware), which unblocks the track “under [worker’s] authority.” EX1004, Vol. I: 36-37, 6; Vol. II: 15, 18; 1[B], 5[A]; 1[E], 5[D].

Kruijswijk supplies transmitting the “release code” such that the worker in FRA-Report transmits the code (as taught by Kruijswijk), *e.g.*, selecting the “Cancel/Fulfill” link (or, *e.g.*, by call, text, email), to the railway control apparatus, which will only unblock the track once the transmitted code is entered by the dispatcher or automatically by the railway control apparatus. Indeed, Kruijswijk transmits a “release code” to indicate completion of required track safety work.

Specifically, Kruijswijk teaches the code must be returned to a server by the worker as, *e.g.*, a “safety check.” EX1005, 12:13-21. Kruijswijk describes that “after the repair of [the] railroad track” (*id.*, 12:17-18), the worker’s mobile phone “request[s] ... to enter a personal secret code.” *Id.*, claim 1, 7:1-17, 2:8-11. Thereafter, the worker (via the phone) “transfer[s] a message containing the personal secret code from the [] communication device via the communication network to the server station.” *Id.*, claim 1, 7:1-17, Abstract. The “server station” then “verif[ies]” “the personal secret code” based on the worker’s code in the database. *Id.*, Abstract, 7:1-17, 6:1-9 (database stores code), 12:13-21.

Thus, FRA-Report and Kruijswijk disclose and render obvious 1[E], 5[D].

Additionally, FRA-Report and Kruijswijk disclose and render obvious 1[E], 5[D] given a POSITA would have had a motivation to combine and reasonable expectation of success for two reasons to implement from Kruijswijk the transmitted release code in FRA-Report to the railway control apparatus, which will only unblock the track with the transmitted code.

First, it was known to transmit a secret code to a central system to unblock a track. For instance, Macey teaches a railway worker enters a secret code “such as a PIN (personal identification number) or password *only known to the user*” which “[u]pon the successful entry of this code to the interface [of the command center, it] ... transmit[s] a signal to the signalling device” which changes “from a red light [blocked track] to a green light [unblocked track] and signals ... the train to proceed.” EX1007, 15:16-35 (emphasis added), 20:31-37, 16:1-21 (railway worker must enter “a specific code before it is deemed the target zone [] is safe for the passage of the vehicle.”), 13:35-14:4; *see also* EX1006, 7:8-15 (code “is transmitted again to the authorization computer” which “verifies” the code to control access), Abstract, 5:7-9, 5:24-48, 7:60-61. Thus, it would have been predictable to implement from Kruijswijk the transmitted secret code in FRA-Report to unblock the track.

Second, there were known problems and motivations in the art which would have predictably led to implement from Kruijswijk the transmitted secret code in

FRA-Report to the railway control apparatus to unblock the track. These include for instance: [a] the problem of protecting railway workers from the improper removal of a track block such that a POSITA would have used the worker's transmitted code to unblock the track; [b] a worker operated a mobile device to take and return control of a work zone from a central system and as such, a code to release a track block would have been obvious to try; and [c] a one-time code transmitted to the server for authentication and thus, it would have been predictable for a POSITA to apply such code authentication to railway systems to ensure a track block is only unblocked with the code transmitted from the worker.

Alternatively, the above-discussed combination meets 1[E], 5[D] given Railware has expressed that these limitations include a person (“Chief Traffic Controller”) retrieving the code from the railway control apparatus’ storage when a worker is unavailable to transmit the code. EX1024, 21-22; EX1025, ¶¶118-120; *see supra* pp.9-10 (“unavailable”), 12 (code not “limited to ... only via the user terminal”). Such a code lookup would have been obvious to try to a POSITA, where another person obtains the saved code from storage in the railway control apparatus and enters the code (or provides it to the dispatcher) to release the track block. Indeed, it was routine and predictable, as discussed below, to store codes and use them to control another action, such as worker safety or control access. *See infra* pp.50-51.

According to Railware, the received code can be manually entered by the dispatcher or automatically “without dispatcher intervention.” EX1024, 11-12; EX1025, ¶¶ 296, 312-313, 321, 341, 350, 358. But, Claims 1 and 5 do not recite entry of the release code.

Nonetheless, to the extent a dispatcher must enter the code, a POSITA would have been motivated with a reasonable expectation of success for the dispatcher to enter the received release code because it would have ensured the dispatcher is alerted to the information provided, prevented the track block from being released until the dispatcher enters the code, and reduced any miscommunication.

Otherwise, a POSITA would have had a motivation to combine and reasonable expectation of success to automatically unblock the track block with the transmitted code as FRA-Report automatically unblocks the track at the worker’s control (Section VI.A.3, F, pp.45-46) and it is a design choice for efficiency.

Under either method, FRA-Report’s railway control apparatus would verify the generated release code stored in the database (or other storage) with the worker’s transmitted release code entered by the dispatcher or automatically and if the code matches, then the track is unblocked, otherwise the track remains blocked. It was known to save a generated code into a database (or other storage) and verify codes to control another action. EX1005, 6:1-9, Abstract, 7:1-17, 11:8-17; EX1006, 7:8-

15, Fig. 2; EX1007, 15:28-35; EX1008, 7:54-59; EX1009, Figs. 12, 14 (“received confirmation code = supplied confirmation code?”), 14:19-25, 15:17-27.

Accordingly, FRA-Report and Kruijswijk disclose and render obvious 1[E], 5[D]. Given the foregoing, FRA-Report and Kruijswijk disclose 1[E], 5[D] “user terminal” under Railware’s construction (dispatcher’s terminal) given the railway control apparatus will unblock the track with the release code and SEPTA’s construction (worker’s terminal) as the worker transmits the code. *See supra* pp.11-12, 47-49. They also teach Railware’s and SEPTA’s understanding of “from the user terminal in return” as the worker transmits the code (or chief traffic controller retrieves the code if the worker is unavailable). *Id.*; Kaufman, ¶¶257-275, 57-78.

ii. Motivation to Combine FRA-Report and Kruijswijk with a Reasonable Expectation of Success

A POSITA would have modified FRA-Report with Kruijswijk because it would have been predictable given CTC systems and secret-code systems were known, FRA-Report recognized that a secret-code system would have been implemented in the FRA-Report, and prior art discusses that technologies would have been applied to enhance worker safety. *See supra* pp.5, 26, 39-41, Sections VI.A.3, B-F.

A POSITA would have had a motivation to combine and reasonable expectation of success for the railway control apparatus to only unblock a track with the release code (as taught by Kruijswijk) transmitted by the worker in FRA-Report

because it would have been a predictable option given it would “minimize[] common human error” and enhance the “verification system” in the FRA-Report. EX1004, Vol. I: 9, 27. A “handshake” or verification protocol, where the worker unblocks the track with the code taught in Kruijswijk, would have been thus obvious to try, particularly as Kruijswijk teaches verifying the user with a secret code. *See supra* p.43; EX1028, 4, 14-15; EX1005, 6:1-9, 7:1-17.

Likewise, a POSITA would have been motivated to combine FRA-Report and Kruijswijk given FRA-Report itself discloses a readiness to receive improvements towards verifying a track worker. EX1004, Vol. I: 57-58 (need “to positively identify the person communicating with the PDA by utilizing some form of password protection.”)

Moreover, Kruijswijk and FRA-Report involve railway technology and worker safety including verification (*see* Sections VI.A.3, B, F) and thus a POSITA would have combined them, particularly as it would strengthen FRA-Report’s goal to “improve roadway worker safety and productivity” because the dispatcher would not unblock the track without the worker’s release code. EX1004, Vol. I: Preface.

Alternatively, a POSITA would have been likewise motivated to modify FRA-Report to transmit the release code upon the worker [a] selecting the “Cancel/Fulfill” link, [b] calling, or [c] texting or emailing a message (such as via an embedded link activated to transmit the code) to the railway control apparatus to

unblock the track. EX1005, 12:20-21; EX1004, Vol II.: 15, 21, 27, 63; EX1017, 15-16. This would have provided an efficient and alternative means to unblock the track, particularly as both the FRA-Report and Kruijswijk discuss text messages and text, email, and links were well-known. *Id.*

A POSITA would have appreciated that modifying FRA-Report with Kruijswijk would have had a reasonable expectation of success. FRA-Report contains a CTC system with hardware and software to unblock a track at the worker's request from a mobile device. 1[D], 5[C]; 1[A]; 1[C], 5[B]; 1[E], 5[D]. FRA-Report notes that "[t]he system is designed to be highly configurable" (EX1004, Vol. I: 41). *See supra* p.44; Kaufman, ¶¶276-282, 57-78.

2. Dependent Claims 2-4, 6-8

a. Claims 2, 6

The railway control apparatus generates a release code and transmits it and other information (*e.g.*, Form D, Form D recipient) as a message displayed (such as a prompt or text box) to the worker's PDA or electronic contact address. *See* 1[D], 5[C]; EX1004, Vol. I: 34 (Fig. A-3), 32 (A-1). Alternatively, the release code would be transmitted to the worker through other methods, such as text message and email message. *Id.*

When the worker activates the "Cancel/Fulfill" embedded link, it would transmit the release code to the railway control apparatus. *See* 1[E], 5[D].

Alternatively, upon activating the embedded link, the system would prompt the worker to enter the release code and then transmit it to the railway control apparatus.

Id.

As another option, the worker would transmit the release code to the railway control apparatus by calling the dispatcher with the code or texting or emailing the code. *Id.* Alternatively, the text and email message sent to the worker above would have included an embedded link to activate the return of the code to the railway control apparatus. *Id.*

Accordingly, FRA-Report and Kruijswijk teach Claims 2, 6, particularly “to respond to the message to release the block” under Railware’s broad construction of any “standard type of user interface” and SEPTA’s construction to respond to the message. *See supra* p.11; Kaufman, ¶¶283-291.

b. Claims 3, 7

See Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶292-293.

c. Claims 4, 8

See Claims 2, 6; 1[E], 5[D]; Kaufman, ¶¶294-296.

B. Ground 2: Claims 1-8 Are Obvious Over FRA-Report, Kruijswijk, and Macey

1. Independent Claims 1, 5

a. 1[Pre], 5[Pre]

FRA-Report discloses 1[Pre], 5[Pre]. *See* Ground 1, 1[Pre], 5[Pre]; Kaufman, ¶311.

b. 1[A]

FRA-Report discloses 1[A]. *See* Ground 1, 1[A]; Kaufman, ¶312.

c. 1[B], 5[A]

FRA-Report discloses 1[B], 5[A]. *See* Ground 1, 1[B], 5[A]; Kaufman, ¶313.

d. 1[C], 5[B]

FRA-Report discloses 1[C], 5[B]. *See* Ground 1, 1[C], 5[B]; Kaufman, ¶314.

e. 1[D], 5[C]

FRA-Report and Kruijswijk disclose and render obvious 1[D], 5[C]. *See* Ground 1, 1[D], 5[C]; Kaufman, ¶315.

f. 1[E], 5[D]

FRA-Report, Kruijswijk, and Macey disclose and render obvious 1[E], 5[D].

i. FRA-Report, Kruijswijk, and Macey Combination

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway control apparatus, which unblocks the track. *See* Ground 1, 1[E], 5[D]; 1[B], 5[A]. Kruijswijk teaches transmitting a “release code.” *See* Ground 1, 1[D], 5[C]. Macey supplies the implementation of unblocking the track

only based on the worker transmitting a secret code to a central system. *See supra* p.48; Section VI.D.

Based on Macey's implementation, the worker would transmit the release code as taught in Kruijswijk to the railway control apparatus, which will only unblock the track once the transmitted code is entered by the dispatcher or automatically. *See* Ground 1, 1[E], 5[D]; *supra* pp.48-51.

Additionally, a POSITA would have been motivated to combine with a reasonable expectation of success FRA-Report and Kruijswijk with Macey's implementation of unblocking the track with a secret code given the known problems and motivations such as protecting workers, a worker controlling a work zone, and one-time code. *See supra* pp.48-49.

FRA-Report, Kruijswijk, and Macey further teach "user terminal" and "from the user terminal in return." *See supra* p.51. It would have been obvious to automatically unblock the track or the dispatcher entering the code (or chief traffic controller retrieving the code from storage if the worker is unavailable). *See supra* pp.49-51; Kaufman, ¶¶316-324, 57-78.

ii. Motivation to Combine FRA-Report, Kruijswijk, and Macey with a Reasonable Expectation of Success

A POSITA would have been motivated to combine them with a reasonable expectation of success as it would have been predictable as secret code systems were

known and FRA-Report recognized that such secret code system would have been implemented. *See supra* pp.5, 26, 39-41, Sections VI.A.3, B-F; EX1007, 14:11-15.

FRA-Report's "verification system" and goal to "minimize[] common human error" enhance the motivation for combining FRA-Report, Kruijswijk, and Macey. EX1004, Vol. I: 9, 27. A "handshake" or verification protocol, where the worker unblocks the track with the code taught in Kruijswijk, would have been predictable as Kruijswijk and Macey teach verifying the user with a secret code. *See supra* pp.43, 51-52; EX1028, 4, 14-15; EX1005, 6:1-9, 7:1-17; EX1007, 15:16-35, 20:31-37.

Likewise, FRA-Report recognized the need "to positively identify the person communicating with the PDA by utilizing some form of password protection." EX1004, Vol. I: 57-58. Thus, a POSITA would have been motivated to combine them to verify a track worker with the release code. EX1004, Vol. I: 57-58; EX1007, 15:16-35, 20:31-37.

Moreover, FRA-Report, Kruijswijk, and Macey involve railway technology and worker device communication with a central railway system for railway work (Sections VI.A.3, B, D, F). Thus, a POSITA would have been motivated to combine them, particularly as it would strengthen FRA-Report's goal to "improve roadway worker safety and productivity." EX1004, Vol. I: Preface; Ground 1, 1[E], 5[D].

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the release code upon the worker [a] selecting "Cancel/Fulfill" link, [b]

calling, or [c] texting or emailing a message (such as via an embedded link activated to transmit the code) to the railway control apparatus to unblock the track. *See supra* pp.52-53. A POSITA would have appreciated that modifying FRA-Report and Kruijswijk with Macey’s implementation would have had a reasonable expectation of success given the existing hardware and software in the FRA-Report. *See supra* pp.43-44, 53; Kaufman, ¶¶325-330, 57-78.

2. Dependent Claims 2-4, 6-8

a. Claims 2, 6

The railway control apparatus transmits the code as a message (*e.g.*, prompt or text box message), text message, or email message to the worker’s PDA. Ground 1, Claims 2, 6, 1[D], 5[C]. The worker would transmit the release code to the railway control apparatus by selecting or activating the “Cancel/Fulfill” embedded link, texting or emailing a message (such as an embedded link), or by calling the dispatcher with the code. *See* 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶331-332.

b. Claims 3, 7

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶333.

c. Claims 4, 8

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶334.

C. Ground 3: Claims 1-8 Are Obvious Over FRA-Report and Schmitz

1. Independent Claims 1, 5

a. 1[Pre], 5[Pre]

FRA-Report discloses 1[Pre], 5[Pre]. *See* Ground 1, 1[Pre], 5[Pre]; Kaufman, ¶349.

b. 1[A]

FRA-Report discloses 1[A]. *See* Ground 1, 1[A]; Kaufman, ¶350.

c. 1[B], 5[A]

FRA-Report discloses 1[B], 5[A]. *See* Ground 1, 1[B], 5[A]; Kaufman, ¶351.

d. 1[C], 5[B]

FRA-Report discloses 1[C], 5[B]. *See* Ground 1, 1[C], 5[B]; Kaufman, ¶352.

e. 1[D], 5[C]

FRA-Report and Schmitz disclose and render obvious these limitations.

i. FRA-Report and Schmitz Combination

Schmitz supplies the “release code” such that the dispatcher in FRA-Report operates the track display via the railway control apparatus and blocks the track as well as generates and transmits the “release code” (as taught in Schmitz) to a worker’s electronic contact address accessible by the worker’s PDA interface. *See* Ground 1, 1[D], 5[C]; 1[C], 5[B].

Schmitz teaches generating and transmitting a “release code.” Schmitz describes that, upon a relevant person’s request, an “authentication computer

[authorization computer or server] 2 generates the transaction authorization number TAN or the comparable password” using “a random number generator 5” EX1006, 6:63-7:4, 8:19-21, 5:58, 3:29-33, 2:57-3:5, Abstract, Fig. 2. The server transmits this code over the Internet to the authorized relevant person’s electronic address, *e.g.*, mobile phone. *Id.*, 2:21-24, 3:3-18, 5:3-6, 6:63-7:4, 7:54-65, Abstract.

Thus, FRA-Report and Schmitz disclose and render obvious 1[D], 5[C]. Given the foregoing, they also disclose these limitations under the Board’s understanding of “release code” (*see supra* pp.9-10) because the code taught in Schmitz (TAN or password) is randomly-generated and secret or only known to the relevant person. EX1006, 6:63-7:4, 8:19-21, 5:58, 2:57-3:5, Abstract 3:29-33. Indeed, Schmitz provides a “one-time” code to the relevant person and ensures a third-party cannot “misuse” the code. EX1006, 1:11-33, 7:16-18.

Likewise, FRA-Report and Schmitz disclose and render obvious 1[D], 5[C] under Railware’s construction, including the code taught in Schmitz is secret to the relevant person or “not readily available” to the dispatcher. *See supra* pp.9-10.

Additionally, a POSITA would have had a motivation to combine and reasonable expectation of success to implement Schmitz as a release code or secret code in FRA-Report because it was obvious to try given it was known to generate and transmit a secret code, *e.g.*, for safety and security, only received by the relevant worker before the Priority Date. *See supra* pp.39-40.

Likewise, given the known problems and motivations in the art, a POSITA would have predictably implemented Schmitz as a release code in FRA-Report. These include for instance protecting railway workers from the improper removal of a track block; a worker operated a mobile device to control a work zone; and a one-time code only received by the relevant party. *See supra* pp.40-41.

Accordingly, FRA-Report and Schmitz disclose and render obvious 1[D], 5[C]. Given the foregoing, FRA-Report and Schmitz disclose 1[D], 5[C] under Railware's and SEPTA's construction of "user terminal" (dispatcher's terminal) because the dispatcher operates a computer to block the track as well as generate and transmit the release code to a worker's PDA. *See supra* pp.11-12, 35-41; Kaufman, ¶¶353-366, 57-78.

ii. Motivation to Combine FRA-Report and Schmitz with a Reasonable Expectation of Success

A POSITA would have had a motivation to combine with a reasonable expectation of success given both FRA-Report and Schmitz discuss controlling access. *See* Sections VI.A.3, C, F. Schmitz expresses the "very secure, low cost" of implementing its system. EX1006, 6:24-26.

It would have been predictable to modify FRA-Report with Schmitz because secret-code systems were known and FRA-Report recognized that a secret-code system would have been implemented. *See supra* pp.5, 26, 39-41, Sections VI.A.3, B-F.

FRA-Report urges a need to implement verification measures (including password-based ones) to effectively verify roadway worker identities, and Schmitz teaches one such code-based approach for identity verification. EX1004, Vol. I: 57-58.

A POSITA would have been motivated with a reasonable expectation of success by FRA-Report's goals to "improve roadway worker safety and productivity" (EX1004, Vol. I: Preface) and implement a "verification system." *Id.*, 9, 27; 1[B], 5[A]. A POSITA would have recognized, to prevent the dispatcher from revoking a blocked track and increase security and safety, that FRA-Report would implement a "handshake" protocol where the code taught in Schmitz is associated with the blocked track and transmitted to the worker who unblocks the track with the same code. *See supra* p.43.

A POSITA would have appreciated that modifying FRA-Report with Schmitz would have had a reasonable expectation of success to generate and transmit a code to a worker's device given the existing hardware and software in FRA-Report. Ground 1, 1[D], 5[C]; 1[A]; 1[C], 5[B]; 1[E], 5[D]; *see supra* pp.43-44. Schmitz describes the simplicity of implementing its system. EX1006, 6:24-26. With such hardware and software, FRA-Report would have had flexibility when the code is generated, such as before or after the block is placed.

The POSITA would have been motivated to modify FRA-Report with a reasonable expectation of success for the worker’s interface to receive and display the release code taught in Schmitz given it is a design choice. Ground 1, 1[B], 5[A].

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the code taught by Schmitz with a reasonable expectation of success by text or email message as each would have provided an alternate form. *See supra* pp.44-45. As another option, the text and email message would have included an embedded link to return of the code. Kaufman, ¶¶367-374, 57-78.

f. 1[E], 5[D]

FRA-Report and Schmitz disclose and render obvious these limitations.

i. FRA-Report and Schmitz Combination

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway control apparatus, which unblocks the track. *See* Ground 1, 1[E], 5[D]; 1[B], 5[A].

Schmitz supplies transmitting the “release code” such that the worker in FRA-Report transmits the code, *e.g.*, selecting the “Cancel/Fulfill” link (or, *e.g.*, call, text, email), to the railway control apparatus, which will only unblock the track once the transmitted code is entered by the dispatcher or automatically by the railway control apparatus. *See* Ground 1, 1[E], 5[D].

Schmitz teaches the relevant person transmitting the release code to the server and, only upon receiving and verifying the code, the server allows access. The person enters the code (TAN or password) into “data input apparatus” of the receiver, and the code “is transmitted again to the authorization computer” which “verifies” the code to control, *e.g.*, a locking mechanism or “physical access controls.” EX1006, 7:8-15, Abstract, 5:7-9, 5:24-48 (applied across numerous “fields of application”), 7:60-61 (“The receiver 3 can be a radio receiver incorporated into the data input apparatus 1.”). Thus, FRA-Report and Schmitz disclose and render obvious these limitations.

Additionally, a POSITA would have been motivated to combine FRA-Report and Schmitz with a reasonable expectation of success to implement from Schmitz the transmitted release code in FRA-Report to the railway control apparatus, which will only unblock the track with the transmitted code given it was known to implement a secret code to unblock a railway track (*see supra* p.48) and the known problems and motivations such as protecting workers, a worker controlling a work zone, and one-time code. *See supra* pp.48-49.

Accordingly, FRA-Report and Schmitz disclose and render obvious 1[E], 5[D]. Given the foregoing, FRA-Report and Schmitz further teach “user terminal” and “from the user terminal in return.” *See supra* p.51. It would have been obvious, as discussed, to automatically unblock the track or based on the dispatcher entering

the code (or chief traffic controller retrieving the code from storage if the worker is unavailable). *See supra* pp.49-51; Kaufman, ¶¶375-385, 57-78.

ii. Motivation to Combine FRA-Report and Schmitz with a Reasonable Expectation of Success

A POSITA would have combined them with a reasonable expectation of success as it would have been predictable given secret-code systems were known and FRA-Report recognized that a secret-code system would have been implemented. *See supra* pp.5, 26, 39-41, Sections VI.A.3, B-F.

FRA-Report's "verification system" and goal to "minimize[] common human error" would further enhance such motivation for FRA-Report and Schmitz. EX1004, Vol. I: 9, 27. A "handshake" protocol, where the worker unblocks the track with the code taught in Schmitz, would have been predictable as Schmitz teaches verifying the user with a secret code. *See supra* pp.42-43, 51-52, 12; EX1028, 4, 14-15; EX1006, 7:8-15.

FRA-Report recognized the need "to positively identify the person communicating with the PDA by utilizing some form of password protection." EX1004, Vol. I: 57-58. Thus, a POSITA would have been motivated to combine FRA-Report and Schmitz to verify a track worker with the release code. *Id.*

A POSITA would have been motivated to combine FRA-Report and Schmitz with a reasonable expectation of success as both involve a verification system and access control (Sections VI.A.3, C, F), and thus it would have been obvious to try

because it would strengthen FRA-Report’s goal to “improve roadway worker safety and productivity” as the dispatcher would not unblock the track without the worker’s release code. EX1004, Vol. I: Preface; Ground 1, 1[E], 5[D].

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the release code upon the worker [a] selecting the “Cancel/Fulfill” link, [b] calling, or [c] texting or emailing a message (via an embedded link activated to transmit the code) to the railway control apparatus to unblock the track. *See supra* pp.52-53.

A POSITA would have appreciated that modifying FRA-Report with Schmitz would have had a reasonable expectation of success given the existing hardware, software, and dispatcher and worker interfaces in the FRA-Report. *See supra* pp.43-44, 53; Kaufman, ¶¶386-392, 57-78.

2. Dependent Claims 2-4, 6-8

a. Claims 2, 6

The railway control apparatus transmits the code (taught in Schmitz) as a message (*e.g.*, prompt or text box message), text message, or email message to the worker’s PDA. *See* 1[D], 5[C]; Ground 1, 1[D], 5[C].

The worker would transmit the code to the railway control apparatus by activating the “Cancel/Fulfill” embedded link, texting or emailing a message (such as via an embedded link), or by calling the dispatcher with the code. *See* 1[E], 5[D];

Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶393-395.

b. Claims 3, 7

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶396.

c. Claims 4, 8

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶397-398.

D. Ground 4: Claims 1-8 Are Obvious Over FRA-Report, Byford, and Macey

1. Independent Claims 1, 5

a. 1[Pre], 5[Pre]

FRA-Report discloses 1[Pre], 5[Pre]. *See* Ground 1, 1[Pre], 5[Pre]; Kaufman, ¶410.

b. 1[A]

FRA-Report discloses 1[A]. *See* Ground 1, 1[A]; Kaufman, ¶411.

c. 1[B], 5[A]

FRA-Report discloses 1[B], 5[A]. *See* Ground 1, 1[B], 5[A]; Kaufman, ¶412.

d. 1[C], 5[B]

FRA-Report discloses 1[C], 5[B]. *See* Ground 1, 1[C], 5[B]; Kaufman, ¶413.

e. 1[D], 5[C]

FRA-Report and Byford disclose and render obvious these limitations.

i. FRA-Report and Byford Combination

Byford supplies the “release code” such that the dispatcher in FRA-Report operates the track display via the railway control apparatus and blocks the track as well as generates and transmits the “release code” (as taught in Byford) to a worker’s electronic contact address accessible by the worker’s PDA interface. *See* Ground 1, 1[D], 5[C]; 1[C], 5[B].

Byford teaches that after a server receives a request for access from the relevant person and validates such person, the server generates a “cipher lock code”

and transmits this code in “encrypted form” over the Internet to the person’s wireless device which “decrypt[s]” the code. EX1011, 4:31-40, 2:22-31, Abstract, 4:18-24, 5:25-30, claims 1, 3.

To prevent “unauthorized access,” Byford provides “one-time access” code to the relevant person. EX1011, 5:7-14. A POSITA would have recognized this code would have been, *e.g.*, random number or alphanumeric characters. EX1005, 8:14-16; EX1006, 6:63-7:4, 2:65-3:1; *see supra* pp.39-40.

Thus, FRA-Report and Byford disclose and render obvious 1[D], 5[C]. Given the foregoing, they also disclose these limitations under the Board’s understanding of “release code” (see *supra* pp.9-10), including the code taught in Byford is a secret code: encrypted (“cipher” code) for “one-time access” by the relevant person. Byford even validates the relevant person before providing the code.

FRA-Report and Byford disclose and render obvious 1[D], 5[C] under Railware’s construction, including the code taught in Byford is secret to the relevant person or “not readily available” to the dispatcher. *See supra* pp.9-10.

Additionally, a POSITA would have had a motivation to combine and reasonable expectation of success to implement Byford as a release code or secret code in FRA-Report because it was obvious to try given it was known to generate and transmit a secret code, *e.g.*, for safety and security, only received by the relevant worker before the Priority Date. *See supra* pp.39-40.

Further, given the known problems and motivations in the art, a POSITA would have predictably implemented Byford as a release code in FRA-Report. These include for instance protecting railway workers from the improper removal of a track block; a worker operated a mobile device to control a work zone; and a one-time code only received by the relevant party. *See supra* pp.40-41.

Accordingly, FRA-Report and Byford disclose and render obvious 1[D], 5[C]. Given the foregoing, FRA-Report and Byford also teach “user terminal” under Railware and SEPTA’s construction. *See supra* pp.11-12, 41; Kaufman, ¶¶414-426, 57-78.

ii. Motivation to Combine FRA-Report and Byford with a Reasonable Expectation of Success

A POSITA would have had a motivation to combine with a reasonable expectation of success given both FRA-Report and Byford discuss controlling access. *See* Sections VI.A.3, E-F.

A POSITA would have modified FRA-Report with Byford because it would have been obvious to try as secret-code systems were known and FRA-Report recognized that a secret-code system would have been implemented. *See supra* p.5, 26, 39-41, Sections VI.A.3, B-F.

FRA-Report urges a need to implement verification measures (including password-based ones) to effectively verify roadway worker identities, and Byford teaches one such code-based approach. *See supra* p.43.

A POSITA would have been motivated with a reasonable expectation of success by the FRA-Report's goals to "improve roadway worker safety and productivity" (EX1004, Vol. I: Preface) and implement a "verification system." *Id.*, 9, 27; 1[B], 5[A]. A POSITA would have recognized, to prevent the dispatcher from revoking a blocked track, that FRA-Report would implement a "handshake" or verification protocol where the code taught in Byford is associated with the blocked track and transmitted to the worker who unblocks the track with the same code. *See supra* p.43.

A POSITA would have appreciated that modifying FRA-Report with Byford would have had a reasonable expectation of success to generate and transmit a code in FRA-Report to a worker's device given the hardware and software in FRA-Report. Ground 1, 1[D], 5[C]; 1[A]; 1[C], 5[B]; 1[E], 5[D]; *supra* pp.43-44. The worker's PDA in FRA-Report has encryption and decryption technology (which is known) to decrypt the code taught in Byford. EX1004, Vol. I: 57; EX1011, 4:5-24. With hardware and software, the FRA-Report would have had flexibility when the code is generated.

The POSITA would have been motivated to modify FRA-Report with a reasonable expectation of success for the worker's interface to receive and display the release code taught in Byford given the worker's user interfaces and it is a design choice by a POSITA. Ground 1, 1[B], 5[A].

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the code taught by Byford with a reasonable expectation of success to the worker by text message or email message. *See supra* pp.44-45; Kaufman, ¶¶427-433, 57-78.

f. 1[E], 5[D]

FRA-Report, Byford, and Macey disclose and render obvious these limitations.

i. FRA-Report, Byford, and Macey Combination

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway control apparatus, which unblocks the track. *See* Ground 1, 1[E], 5[D]; 1[B], 5[A]. Byford teaches a release code. Macey supplies the implementation of unblocking the track only based on the worker transmitting a secret code to a central system (*see supra* p.48, Section VI.D).

Based on Macey’s implementation, the worker would transmit the release code as taught in Byford to the railway control apparatus, which will only unblock the track once the transmitted code is entered or automatically by the railway control apparatus. *See* Ground 1, 1[E], 5[D]; *see supra* pp.49-51.

Additionally, a POSITA would have been motivated to combine with a reasonable expectation of success FRA-Report and Byford with Macey’s

implementation given the known problems and motivations such as protecting workers, a worker controlling a work zone, and one-time code. *See supra* pp.48-49.

Accordingly, FRA-Report, Byford, and Macey disclose and render obvious 1[E], 5[D]. Given the foregoing, FRA-Report, Byford, and Macey further teach “user terminal” and “from the user terminal in return.” *See supra* p.51. It would have been obvious to automatically unblock the track or enter the code (or chief traffic controller retrieving the code from storage if the worker is unavailable). *See supra* pp.49-51; Kaufman, ¶¶434-443, 57-78.

ii. Motivation to Combine FRA-Report, Byford, and Macey with a Reasonable Expectation of Success

A POSITA would have combined them with a reasonable expectation of success as it would have been predictable given secret-code systems were known and FRA-Report recognized that a secret-code system would have been implemented in the FRA-Report. *See supra* pp.5, 26, 39-41, Sections VI.A.3, B-F.

FRA-Report’s “verification system” and goal to “minimize[] common human error” would further enhance such motivation. EX1004, Vol. I: 9, 27. A “handshake” protocol, where the worker unblocks the track with the code taught in Byford, would have been obvious to try. *See supra* pp.43, 51-52; EX1028, 4, 14-15.

FRA-Report recognized the need “to positively identify the person communicating with the PDA by utilizing some form of password protection.” EX1004, Vol. I: 57-58. Thus, a POSITA would have been motivated to combine

FRA-Report, Byford, and Macey with a reasonable expectation of success to verify the worker with the release code. *Id.*; Ground 1, 1[E], 5[D].

A POSITA would have combined them with a reasonable expectation of success as they involve controlling access to a location or secured area. *See* Sections VI.A.3, D-F.

Alternatively, a POSITA also would have been motivated to modify FRA-Report to transmit the release code upon the worker [a] selecting the “Cancel/Fulfill” link, [b] calling, or [c] texting or emailing a message (such as via an embedded link activated to transmit the code) to the railway control apparatus to unblock the track to provide an efficient and alternative means to unblock the track and text, email, and links were well-known. *See supra* pp.52-53.

A POSITA would have appreciated that modifying FRA-Report and Byford with Macey’s implementation would have had a reasonable expectation of success given the hardware and software in FRA-Report. *See supra* pp.43-44, 53; Kaufman, ¶¶444-449, 57-78.

2. Dependent Claims 2-4, 6-8

a. Claims 2, 6

The railway control apparatus transmits the code (taught in Byford) as a message (*e.g.*, prompt or text box message), text message, or email message to the worker’s PDA. *See* 1[D], 5[C]; Ground 1, Claims 2, 6, 1[D], 5[C].

The worker would transmit the release code to the railway control apparatus by selecting or activating the “Cancel/Fulfill” embedded link, texting or emailing a message (such as via an embedded link), or by calling the dispatcher with the code. *See* 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶450-452.

b. Claims 3, 7

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶453.

c. Claims 4, 8

See Claims 2, 6; 1[E], 5[D]; Ground 1, Claims 2, 6, 1[E], 5[D]; Kaufman, ¶¶454-455.

VIII. NO BASIS FOR DISCRETIONARY DENIAL

This Petition includes new grounds not previously presented. *Tesla, Inc. v. Charge Fusion Techs. LLC*, IPR2025-00032, Paper 11, at 12-13 (May 19, 2025) (denying 325(d) challenge as secondary references “were not before the Office”). Based on the USPTO’s March 26, 2025 Memorandum, Petitioner reserves the right to submit briefing regarding discretionary denial.

IX. CONCLUSION

Petitioner requests *inter partes* review and cancellation of Claims 1-8 of the ’782 Patent.

DATED: November 19, 2025

Respectfully submitted,

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CERTIFICATION OF COMPLIANCE UNDER 37 CFR § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), I hereby certify that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 9,517,782 contains 13,990 words as measured by the word processing software used to prepare the document, excluding the cover page, signature block, and portions exempted under 37 C.F.R. § 42.24(a).

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CERTIFICATE OF SERVICE

I hereby certify that on this date, true and correct copies of the foregoing Petition for *Inter Partes* Review and accompanying exhibits were served via Federal Express Overnight to the following address:

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