

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION
Petitioner

v.

RAILWARE, INC.
Patent Owner

IPR2026-00134
Patent RE47,835

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. RE47,835

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Cases	
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EXHIBIT LIST

Exhibit Number	Description
1001	U.S. Patent No. RE47835 (the “RE’835”)
1002	File History of U.S. Patent No. RE47835
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	U.S. Patent No. 9,403,545
1023	File History of U.S. Patent No. 9,403,545

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	WO International Publication No. 2004/042663 to Wise (“Wise”)
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

“heavy brackets [] appears in the original patent but forms no part of this reissue specification” and “italics indicates the additions made by reissue”
EX1001, 1:4-9

Claim Designation	Claim Language
Claim 1	
1[Pre]	A centralized railway control system comprising:
1[A]	a rail personnel contact database registering, for each railway personnel, an electronic contact address of the railway personnel; and
1[B]	a railway traffic control apparatus <i>configured for centralized control of traffic of a centrally controllable railway network including plural railways and a plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network</i> , for controlling access to railway tracks, said railway traffic 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 traffic control apparatus communicates via a network with a user terminal,
1[C]	wherein execution of said one or more programs of executable instructions configures <i>the railway traffic control apparatus comprising</i> the processor to include: a block placing part to place a block on one or more specified track sections <i>in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway traffic control apparatus, the railway traffic control apparatus controlling, by said centralized control operation, one or more interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, to block railway traffic to the specified track sections and thereby to permit a railway field worker to enter the track sections [while blocking railway traffic to said track sections]</i>;
1[D]	a code generation part to generate a removal code, retrieve the electronic contact address of the railway field worker from the rail

	personnel contact database, and transmit the removal code to the electronic contact address of the railway field worker; and
1[E]	a block removal part to remove only upon entry of the removal code <i>by said centralized control operation from the railway control apparatus</i> , the block placed by the block placing part on said one or more track sections.
Claim 2	
[2]	The centralized railway control system of claim 1, wherein the railway traffic control apparatus further comprises: a [RTC] <i>railway traffic controller (RTC)</i> user interface to permit a user to specify said one or more track sections to be blocked, specify an instruction to the centralized railway control system to block the railway traffic to the specified track sections, and specify identifying information of the railway field worker to be performing work in the specified track sections.
Claim 3	
[3]	The centralized railway control system of claim 1, further comprising: a railway control database registering block identifying information, including block limits identifying the one or more blocked track sections, along with the removal code for removing the block of the track sections.
Claim 4	
[4]	The centralized railway control system of claim 1, further comprising: a railway control database registering (a) identification of the user who specified the instruction to block the track sections and (b) block identifying information, including block limits identifying the one or more blocked track sections, notes specifying reasons for the block, and date and time at which the block was placed.
Claim 5	
[5]	The centralized railway control system of claim 1, wherein upon placement by the block placing part of the block of railway traffic to said one or more specified track sections, the code generation part transmits the removal code to the electronic contact address of the railway field worker, and the block of railway traffic to said one or more specified track sections remains in place in the centralized railway control system until the entry of the removal code in the

	centralized railway control system to cause the block removal part to remove the block on said one or more track sections.
Claim 6	
6[Pre]	The centralized railway control system of claim 1, wherein the railway traffic control apparatus further comprises:
6[A]	a block removal user interface to permit a user to enter the removal code to cause the block removal part to remove the block on said one or more track sections,
6[B]	wherein the block of railway traffic to said one or more specified track sections remains in place in the centralized railway control system until the entry of the removal code through the block removal user interface.
Claim 7	
7[Pre]	The centralized railway control system of claim 6, wherein the block removal user interface further requires, in addition to the entry of the removal code, the user to specify that confirmation that the track sections have been cleared has been obtained from the railway field worker associated with the block, before the block removal user interface permits the removal code to be transmitted to the block removal part, and
7[A]	the centralized railway control system further comprises a railway control database registering (a) block identifying information identifying the one or more blocked track sections, date and time at which the block was placed and identifying [information] the railway field worker associated with the block, and (b) block removal information identifying date and time at which the block was removed and identifying the user who entered the removal code and specified that confirmation that the track sections have been cleared was obtained from the railway field worker associated with the block.
[Claim 8	
[8]	The centralized railway control system of claim 1, further comprising: a voice processing part configured to receive a voice message and extract the removal code from the voice message.]
Claim 9	
[9]	The centralized railway control system of claim 1, wherein the code generation part transmits an electronic message to the electronic contact address of the railway field worker, and the electronic message

	transmitted to the electronic contact address of the railway field worker includes the removal code and includes an embedded link for activating a return transmission of the removal code to the block removal part of the centralized railway control system.
Claim 10	
10[Pre]	A railway traffic control apparatus <i>configured for centralized control of traffic of a centrally controllable railway network including plural railways and a plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network</i> , for controlling access to railway tracks, said railway traffic control apparatus comprising:
10[A]	a block placing part to place a block on one or more [selected] <i>specified track sections in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway traffic control apparatus, the railway traffic control apparatus controlling, by said centralized control operation, one or more interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, to block railway traffic to the specified track sections and thereby to permit a railway field worker to enter the track sections [while blocking railway traffic to said track sections]</i> ;
10[B]	a code generation part to generate a removal code, determine an electronic contact address of the railway field worker by accessing a rail personnel contact database registering, for each railway personnel, electronic contact information of the railway personnel, and transmit the removal code to the electronic contact address of the railway field worker; and
10[C]	a block removal part to remove only upon entry of the removal code <i>by said centralized control operation from the railway traffic control apparatus</i> , the block placed by the block placing part on said one or more track sections for the railway field worker.
Claim 11	
[11]	The railway traffic control apparatus of claim 10, further comprising: a [RTC] <i>railway traffic controller (RTC)</i> user interface to permit a user to specify [said one or more] track sections to be blocked, specify an instruction to the [centralized] <i>railway traffic control [system] apparatus</i> to block the railway traffic to the specified track sections,

	and specify identifying information of the railway field worker to be performing work in the specified track sections.
Claim 12	
[12]	The railway traffic control apparatus of claim 10, wherein block identifying information, including block limits identifying the one or more blocked track sections, is registered in a railway control database, along with the removal code for removing the block of the track sections.
Claim 13	
[13]	The railway traffic control apparatus of claim 10, wherein block identifying information, including block limits identifying the one or more blocked track sections, notes specifying reasons for the block, and date and time at which the block was placed, are registered in a railway control database, along with identification of the user who specified the instruction to block the track sections.
Claim 14	
[14]	The railway traffic control apparatus of claim 10, wherein upon placement by the block placing part of the block of railway traffic to said one or more specified track sections, the code generation [code] <i>part</i> transmits the removal code to the electronic contact address of the railway field worker, and the block of railway traffic to said one or more specified track sections remains in place in the [centralized] railway <i>traffic</i> control [system] <i>apparatus</i> until the entry of the removal code in the [centralized] railway <i>traffic</i> control [system] <i>apparatus</i> to cause the block removal part to remove the block on said one or more track sections.
Claim 15	
15[Pre]	The railway traffic control apparatus of claim 10, further comprising:
15[A]	a block removal user interface to permit a user to enter the removal code to cause the block removal part to remove the block on said one or more <i>specified</i> track sections,
15[B]	wherein the block of railway traffic to said one or more specified track sections remains in place in the [centralized] railway <i>traffic</i> control [system] <i>apparatus</i> until the entry of the removal code through the block removal user interface.

Claim 16	
16[Pre]	The railway traffic control apparatus of claim 15, wherein the block removal user interface further requires, in addition to the entry of the removal code, the user to specify that confirmation that the track sections have been cleared has been obtained from the railway field worker associated with the block, before the block removal user interface permits the removal code to be transmitted to the block removal part, and
16[A]	block identifying information identifying the one or more blocked track sections, date and time at which the block was placed and identifying [information] the railway field worker associated with the block is registered in a railway control database, along with block removal information identifying date and time at which the block was removed and identifying the user who entered the removal code and specified that confirmation that the track sections have been cleared was obtained from the railway field worker associated with the block.
[Claim 17	
[17]	The railway traffic control apparatus of claim 10, further comprising: a voice processing part configured to receive a voice message and extract the removal code from the voice message.]
Claim 18	
[18]	The railway traffic control apparatus of claim 10, wherein the code generation part transmits an electronic message to the electronic contact address of the railway field worker, and the electronic message transmitted to the electronic contact address of the railway field worker includes the removal code and includes an embedded link for activating a return transmission of the removal code to the block removal part of the [centralized] railway <i>traffic</i> control [system] <i>apparatus</i> .
Claim 19	
19[Pre]	A method for <i>controlling railway access using a railway traffic control apparatus</i> of a centralized railway control system [to control access to railway tracks] <i>configured for centralized control of traffic of a centrally controllable railway network including plural railways</i>

	<i>and a plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, the method comprising:</i>
19[A]	<i>providing a user interface [on a user terminal] of the railway traffic control apparatus, including a block placing part to place a block on one or more specified track sections in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway traffic control apparatus, the railway traffic control apparatus controlling, by said centralized control operation, one or more interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, to block railway traffic to the specified track sections and thereby to permit a railway field worker to enter the track sections [while blocking railway traffic to said track sections];</i>
19[B]	<i>generating a removal code, determining an electronic contact address of the railway field worker by accessing a rail personnel contact database registering, for each railway personnel, electronic contact information of the railway personnel, and transmitting the removal code to the electronic contact address of the railway field worker; and</i>
19[C]	<i>permitting the block to said one or more track sections to be removed only upon entry of the removal code [in the centralized railway control system] by said centralized control operation from the railway traffic control apparatus.</i>
Claim 20	
20[Pre]	<i>A railway traffic control apparatus configured for centralized control of traffic of a centrally controllable railway network including plural railways and a plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, the railway traffic control apparatus comprising a processor and configured to:</i>
20[A]	<i>place a block on one or more sections of railway track in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway traffic control apparatus, the railway traffic control apparatus controlling, by said centralized control operation, one or more interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, to prevent trains from traversing the one or more sections of railway track;</i>

20[B]	<i>generate a secret release code associated with the blocked one or more sections of railway track;</i>
20[C]	<i>transmit the secret release code to a user terminal via a network;</i>
20[D]	<i>receive the secret release code via the network; and</i>
20[E]	<i>responsive to receiving the secret release code from the terminal, remove the block from the one or more sections of railway track.</i>
Claim 21	
[21]	<i>The railway traffic control apparatus of claim 20, wherein the block is placed via an interlocking signal prohibiting trains from traversing the one or more sections of railway track.</i>
Claim 22	
[22]	<i>The railway traffic control apparatus of claim 20, wherein the railway traffic control apparatus is configured to place the block by causing one or more of the plurality of railway traffic interlocks to display a STOP signal.</i>
Claim 23	
[23]	<i>The railway traffic control apparatus of claim 20, wherein only the railway traffic control apparatus and the user terminal receive the secret release code generated by the railway traffic control apparatus.</i>
Claim 24	
[24]	<i>The railway traffic control apparatus of claim 20, wherein the railway traffic control apparatus is further configured to:</i> <i>store the secret release code in a memory of the railway traffic control apparatus.</i>
Claim 25	
[25]	<i>The railway traffic control apparatus of claim 20, wherein the railway traffic control apparatus is further configured to:</i> <i>generate and store block removal information in response to removing the block from the one or more sections of railway track.</i>
Claim 26	
[26]	<i>The railway traffic control apparatus of claim 25, wherein the block removal information comprises a date and time when the block was removed and identification information of a user who entered the secret removal code.</i>
Claim 27	
[27]	<i>The railway traffic control apparatus of claim 20, wherein the railway traffic control apparatus is configured to transmit the secret release</i>

	<i>code to the user terminal by transmitting a message to the user terminal, the message comprising one or more embedded links.</i>
Claim 28	
[28]	<i>The railway traffic control apparatus of claim 27, wherein the railway traffic control apparatus is configured to receive the secret release code transmitted via the network in response to selection of at least one of the one or more embedded links in the message, on the user terminal.</i>
Claim 29	
[29]	<i>The railway traffic control apparatus of claim 27, wherein the message comprises a text message or an email.</i>
Claim 30	
30[Pre]	<i>A method for controlling railway access using a railway traffic control apparatus configured for centralized control of traffic of a centrally controllable railway network including plural railways and a plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, the method comprising:</i>
30[A]	<i>placing a block on one or more sections of railway track in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway traffic control apparatus, the railway traffic control apparatus controlling, by said centralized control operation, one or more interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network, to prevent trains from traversing the one or more sections of railway track;</i>
30[B]	<i>generating a secret release code associated with the blocked one or more sections of railway track;</i>
30[C]	<i>transmitting the secret release code to a user terminal via a network;</i>
30[D]	<i>receiving the secret release code via the network; and</i>
30[E]	<i>responsive to receiving the secret release code from the terminal, removing the block from the one or more sections of railway track.</i>
Claim 31	
[31]	<i>The method of claim 30, wherein the block is placed via an interlocking signal prohibiting trains from traversing the one or more sections of railway track.</i>
Claim 32	
[32]	<i>The method of claim 30, wherein the railway traffic control apparatus is configured to place the block by causing one or more of the plurality of railway traffic interlocks to display a STOP signal.</i>

Claim 33	
[33]	<i>The method of claim 30, wherein only the railway traffic control apparatus and the user terminal receive the secret release code generated by the railway traffic control apparatus.</i>
Claim 34	
[34]	<i>The method of claim 30, further comprising: storing the secret release code in a memory of the railway traffic control apparatus.</i>
Claim 35	
[35]	<i>The method of claim 30, further comprising: generating and storing block removal information in response to removing the block from the one or more sections of railway track.</i>
Claim 36	
[36]	<i>The method of claim 35, wherein the block removal information comprises a date and time when the block was removed and identification information of a user who entered the secret removal code.</i>
Claim 37	
[37]	<i>The method of claim 30, wherein transmitting the secret release code comprises transmitting a message to the user terminal, the message comprising one or more embedded links.</i>
Claim 38	
[38]	<i>The method of claim 37, wherein the secret release code is transmitted via the network in response to selection of at least one of the one or more embedded links in the message, on the user terminal, and is received by the railway traffic control apparatus.</i>
Claim 39	
[39]	<i>The method of claim 37, wherein the message comprises a text message or an email.</i>
Claim 40	
40[Pre]	<i>A system comprising:</i>
40[A]	<i>a railway control apparatus comprising a processor and a memory device, the railway control apparatus configured to communicate with a plurality of railway traffic interlocks and a user terminal via a network and to perform centralized control of traffic of a centrally controllable railway network including plural railways and the plurality of railway traffic interlocks dispersed in said plural railways</i>

	<i>constituting said railway network, wherein the processor is configured by execution of computer program instructions to cause the railway control apparatus to:</i>
40[B]	<i>receive a selection of track sections to block in any of said plural railways constituting said railway network that is managed by centralized control operation from the railway control apparatus, wherein each selected track section corresponds to one or more railway traffic interlocks amongst the plurality of railway traffic interlocks dispersed in said plural railways constituting said railway network;</i>
40[C]	<i>responsive to receiving the selection, generate a secret code associated with the selected track sections;</i>
40[D]	<i>responsive to generating the secret code, save the secret code in the memory device;</i>
40[E]	<i>associate the secret code with a remote user of the user terminal;</i>
40[F]	<i>transmit a block signal to the corresponding one or more railway traffic interlocks to place a block on the selected track sections; and</i>
40[G]	<i>transmit the secret code to the remote user of the user terminal.</i>
Claim 41	
41[Pre]	<i>The system of claim 40, wherein the processor configured by execution of computer program instructions additionally causes the railway control apparatus to:</i>
41[A]	<i>receive the secret code from the user terminal via the network;</i>
41[B]	<i>verify the secret code by comparing the secret code received from the user terminal with the secret code stored in the memory device;</i>
41[C]	<i>receive an instruction to remove the block from the selected track sections, after verifying the secret code; and</i>
41[D]	<i>responsive to the instruction to remove the block received after verifying the secret code, transmit a block removal signal to the corresponding railway traffic interlocks.</i>

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”).¹

	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 Management Conference is scheduled for

¹ The patents are related as claiming alleged priority to provisional no. 61/893,547.

		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 (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 (“-1180 IPR”) (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 1-7, 9-16, and 18-41 (“Challenged Claims”) of U.S. Pat. RE47,835 (“RE’835”) (EX1001). RE’835 is purportedly assigned to Railware, Inc. (“Railware”).

RE’835 relates to a centralized traffic control (“CTC”) system that (i) blocks a railway track for maintenance work and (ii) generates and transmits a code to a worker’s device—thereafter, the worker transmits the same code to the CTC system to (iii) unblock the track. Railware itself contends this simple back-and-forth transmission of the code is the “crux of the inventive aspect.”² EX1018, 30:17-24.

But, RE’835 merely claims a *known CTC blocking and unblocking system* (e.g., described in FRA-Report) and *adds a known code-based verification* feature (e.g., described in Kruijswijk, Schmitz, Macey, and Byford), such as a one-time code.

This is Wabtec’s first challenge of RE’835. Although the Board denied institution of a prior IPR³ of the RE’835 that relied on the FRA-Report, that prior

² Notably, Claim 40 does not require the worker return the code.

³ *National Railroad Passenger Corporation d/b/a Amtrak v. Railware, Inc.*, IPR2023-01180 (“-1180 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 highlights 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)

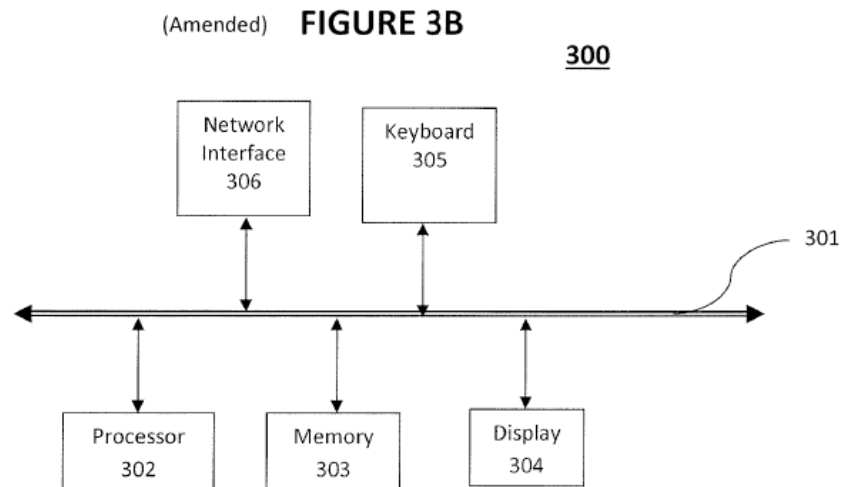
Petitioner is not barred or estopped from requesting this IPR. This petition is one of three petitions that Petitioner is concurrently filing.

II. RE'835 PATENT

A. Summary

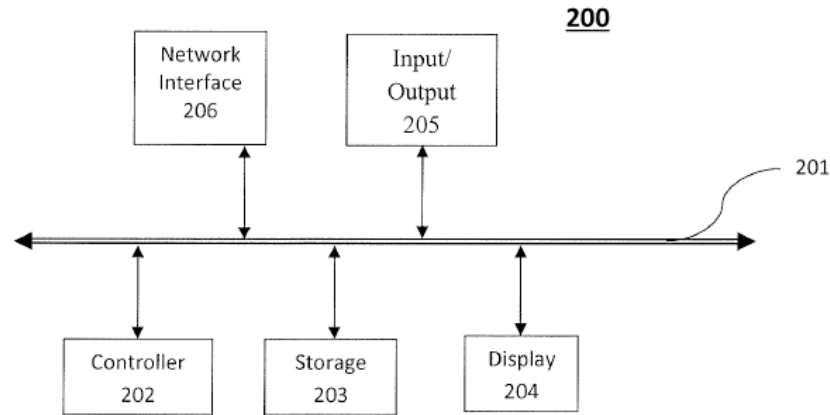
RE'835 concedes CTC systems, including a dispatcher-operated “control console” (interface), were known and used to control interlocking signals to block and unblock tracks. EX1001, 1:29-2:10.

The CTC's generic computer—which is configured to operate as the claimed railway traffic control apparatus—blocks a track based on a worker's request as well as generates and transmits a code to a worker's terminal. EX1001, Abstract, 2:49-3:6, 1:21-2:10. The known railway traffic control apparatus (Fig. 3B) and worker's user terminal (Fig. 3A) are shown below.



Id., Fig. 3B, 6:17-30, 6:57-7:27.

FIGURE 3A



Id., Fig. 3A, 6:31-56, 9:23-25.

After the work, the worker transmits the same code to the railway traffic control apparatus to unblock the track. *Id.*, Abstract, 2:49-3:6, Fig. 4; EX1003 (“Kaufman”), ¶¶78-84.

B. Prosecution History

RE’835 was filed on March 22, 2018 as Application No. 15/928,955 and issued on February 4, 2020. It is a reissue of U.S. Patent No. 9,403,545 (“545 Patent”) and claims alleged priority to a provisional with Application No. 61/893,547. EX1001, cover page.

Preliminary amendments were submitted, adding claims 20-41 to existing claims 1-19. EX1002, 155-157, 242-254. A non-final office action rejection was issued based on several grounds. *Id.*, 306-330. The applicant traversed the rejection, and the Examiner issued a final office action. *Id.*, 370-511. The applicant amended several claims and cancelled claims 8, 17. *Id.* On September 16, 2019, a notice of

allowance was issued. *Id.*, 555-565. On December 8, 2020 and June 1, 2021, certificate of corrections were issued. EX1001, last two pages. Kaufman, ¶¶85-94.

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. RE’835 was evaluated under AIA (EX1002, 315) 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. *See* EX1025, ¶ 63; EX1024, 26.

Petitioner’s expert, Kaufman, was a POSITA at the time of the Priority Date. Kaufman, ¶¶96-102.

IV. CLAIM CONSTRUCTION

Pursuant to 37 C.F.R. § 42.100(b), in *Railware, Inc. v. Southeastern Pennsylvania Transportation Authority*, 2:24-cv-02963-JMY (E.D. Pa.) (“SEPTA litigation”), the parties filed proposed constructions but the case was dismissed prior to a *Markman* order. 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 code in the -1180 IPR and (ii) reserves the right to respond to any proposed constructions advanced by Railware in this proceeding.

A. Claimed Code:

“removal code” (claims 1, 3, 5-7, 9-10, 12, 14-16, 18-19)

“secret release code” (claims 20, 23-24, 27-28, 30, 33-34, 37-38)

“secret code” (claims 40-41)

“secret removal code” (claims 26 and 36)⁴

Term	Railware	SEPTA
“removal code” “secret release code” “release code” ⁵	“A code that is not readily available to the user of the railway [traffic] control apparatus (<i>i.e.</i> , the dispatcher).” EX1024, 17, 18, 23, 19-21, 7; EX1025, ¶¶ 152, 148, 113-114, 128-130.	Indefinite. EX1026, 23-24.

⁴ Railware and SEPTA in their briefs list only certain claims. *See* EX1024, EX1026.

⁵ This term provided by Railware is not recited in the RE’835 claims.

“secret code”	“A code that is not readily available to the user of the railway control apparatus (<i>i.e.</i> , the dispatcher).” <i>Id.</i>	Indefinite. EX1026, 23-24.
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In the -1180 IPR, the Board noted, while not resolving Railware’s proposed construction (similar to above), 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.’” IPR2023-01180, Paper 8, 21 n.12 (Jan. 22 2024).

Moreover, “not readily available” is absent from RE’835 specification, and 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 -1180 IPR stated it was not construing the claimed code, the Board did assess it as shown below:

The ’835 patent makes clear that the code is “only” received by the relevant railway field worker and an internal storage ... Although the ’835 patent describes alternative means for retrieving the code from internal storage when the field worker is unavailable, accessibility to the 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 10:44–48; *see also id.* at 6:3–6, 9:54–56, 10:23–30, 10:35–52 (consistently describing the “removal code”/“secret release code”/“secret code” as “secret”).

IPR2023-01180, Paper 8, at 20-21 (citing EX1001) (internal citations omitted), n.3 (“no material difference between” the code terms); Kaufman, ¶¶114-121.

B. “railway control apparatus” (claims 1, 40-41) and “railway traffic control apparatus” (claims 1-2, 6, 10-16, 18-30, 32-34, 38)

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 this 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, ¶122.

C. “user terminal” (claims 1, 20, 23, 27-28, 30, 33, 37-38, 40-41)

Railware	SEPTA
“user terminal of a railway field worker” EX1025, ¶¶226, 239; EX1024, 43, 47.	“railway field worker’s mobile user device” EX1026, 6-7.

Railware believes its construction encompasses “*any communication device*” and not necessarily a ‘mobile user device’.” EX1024, 47 (emphasis in original). Kaufman, ¶123.

D. “from the terminal” (claims 20, 30) and “from the user terminal” (claim 41)

Railware	SEPTA
“[n]o construction necessary or plain and ordinary meaning” EX1025, ¶¶327-28, 356, 358.	“transmitted from the user terminal (as previously defined)” EX1026, 15-16.

Railware’s expert contends these terms do not require construction beyond Railware’s proposed construction for “user terminal” above and the “claims are ... agnostic as to how the code is transmitted to the railway control apparatus” EX1025, ¶¶328, 356, 358; Kaufman, ¶124.

E. “railway traffic controller” (claims 2, 11)

Railware	SEPTA
“[n]o construction necessary or plain and ordinary meaning” EX1025, ¶¶362, 368.	“train dispatcher” EX1026, 29.

Railware’s expert asserts “railway traffic controller” is the “individual or entity that is controlling railway traffic ... [and] is doing so by interfacing with the ‘user interface’....” EX1025, ¶¶362, 368, 367, 371-373; Kaufman, ¶125.

F. “via the network” (claims 20, 28, 30, 38, 41)

Railware	SEPTA
“No construction necessary or plain and ordinary meaning” EX1025, ¶¶ 375-377, 382, 385	“via the same network used to transmit the secret release code” EX1026, 30.

Railware’s expert contends network is “broadly understood” with “various communications systems and hardware and software components.” EX1025, ¶¶385 (citations omitted), 382 (“one or more networks”), 375-377; Kaufman, ¶126.

G. 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	Reference(s)	Claims	Basis
1	FRA-Report (EX1004) and Kruijswijk (EX1005)	1-7, 9-16, 18-41	103
2	FRA-Report, Kruijswijk, and Macey (EX1007)	1-7, 9-16, 18-41	103
3	FRA-Report and Schmitz (EX1006)	1-7, 9-16, 18-41	103
4	FRA-Report, Byford (EX1011), and Macey	1-7, 9-16, 18-41	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, Title Pages. This report was developed to support the development of data link technologies to improve road worker safety.

FRA-Report was not considered during prosecution of RE’835 and ’545 Patent. EX1002; EX1023; Kaufman, ¶¶128-130.

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. Vol. II states that it is “*continuing development and evaluation of the [Vol. I] application.*” EX1004, Vol. II: 3 (emphasis added), Abstract, ix, 5, 10- 12, 16, 72, Fig. 4.
- Both FRA-Report volumes were published by the U.S. Department of Transportation, FRA. EX1004, Vol. I and Vol. II: cover page.

- Both FRA-Report volumes share overlapping authors. EX1004, Vol. I, Vol. II: Report Documentation Page.
- A POSITA accessing FRA-Report publicly would have found them together as shown below, and both volumes of FRA-Report were published with the same report number (“DOT/FRA/ORD-04/13.” with a “i” and “ii”) and date (“October 2004”).

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

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, 29, 37-38, Figs. A-1-A4, 2, 4; Vol. II: Abstract, ix, 3, 5, 10-12, 16, Figs. 1, 4, Table 2.

Thus, the two volumes should be considered one reference. *VirnetX Inc. v. Apple Inc.*, No. 2022-1523, 2023 WL 6933812, at *3 (Fed. Cir. Oct. 20, 2023). Regardless, there are numerous reasons above a POSITA would have combined the two volumes with a reasonable expectation of success. Kaufman, ¶¶131-133.

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”)

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 EX1012-1015). Moreover, a POSITA would have visited the FRA from 2005-2009 to review research reports, including FRA-Report, to keep updated on current information. Kaufman, ¶135.⁶

⁶ EX1021 (“Malsch”) was likewise accessible. EX1021, front page, Report Documentation Page, 12a.; EX1012-1015 (*see* “DOT/FRA/ORD-04/11”); EX1016; Kaufman, ¶68 n.1. The same applies to EX1028. EX1015, 1 (EX1028 referenced in March 2009); Kaufman, ¶238.

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 section of track as a "Form D" request. *Id.*, Vol. I: 7-8, 14, 55-56. The worker who requested the block track will be sent by the CTC system information, such as "Form D number (automatically assigned by system), Form D recipient, date...." *Id.*, Vol. I: 38.

After 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; Kaufman, ¶¶137-157.

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 RE'835. EX1002; EX1023.

Kruijswijk discloses a system used for railway safety that involves comparing a communicated secret code for identity verification. EX1005, Abstract, 12:13-21. Kruijswijk teaches “generating, at the server station, the personal secret code, e.g. a random number” EX1005, 8:14-16, 3:30.

The secret code is transferred over a network such as the Internet to a “railroad track ... technician[.]” *Id.*, 12:17-21, 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 save code. *Id.*, 2:8-13, 11:8-17, 6:1-9, Abstract; Kaufman, ¶¶163-172.

C. Schmitz

U.S. Patent No. 6,078,908 (EX1006, “Schmitz”) issued on June 20, 2000, and is therefore prior art under at least AIA § 102(a) without any § 102(b) exceptions. Schmitz was not considered during prosecution of RE’835. EX1002; EX1023.

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.” *Id.*, 6:63-7:4, 8:19-21, 5:58, 2:57-3:5, Abstract.

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 relevant person transmits the code “to the authorization computer 2” which “verifies” the code to control access. *Id.*, 7:4-15, 5:7-9, 5:24-31, 7:60-61; Kaufman, ¶¶438-450.

D. Macey

PCT Pub. No. WO 2010/012040 (EX1007, “Macey”) published on February 4, 2010. It is prior art under at least AIA § 102(a) without any § 102(b) exceptions. Macey was not considered during prosecution of RE’835. EX1002; EX1023.

Macey discloses a system for enhancing railway worksite safety that involves comparing a secret code transmitted by a railway worker before an approaching train is allowed to proceed through the worksite area. 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.*, 20:34-37, 15:28-35; Kaufman, ¶¶363-374.

E. Byford

U.S. Patent No. 6,581,161 (EX1011, “Byford”) issued on June 17, 2003, and is therefore prior art under at least AIA § 102(a) without any § 102(b) exceptions. Byford was not considered during prosecution of RE’835. EX1002; EX1023.

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, 3:61-4:3, 5:7-14, 5:25-30, claims 1, 3; Kaufman, ¶¶538-546.

F. Analogous Art

Under two separate tests, “same field of endeavor” or “reasonably pertinent to the particular problem” to the alleged inventor, 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 in RE’835. EX1001, title, Abstract, 1:21-2:10, 2:49-3:6, 4:8-10, 4:42-46. Railware’s expert’s description of RE’835 likewise supports this and any purported problem as discussed below. EX1025, ¶¶54 (“control traffic over a railway track section when a railway worker is working on or near the track section”), 57, 20; 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; Sections VI.A, D; Kaufman, ¶¶ 137-157, 363-374.

- **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, ¶¶ 163-172.
- **Schmitz**: relates to access control given it provides 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 applied Schmitz to railway work (*e.g.*, “computer centers,” “security regions”) and Schmitz’s reference to a “user” would have encompassed workers. Kaufman, ¶¶ 438-450.
- **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 applied Byford to railway work (*e.g.*, “secured location” or “secured area”) and Byford’s reference to

a “user” would have encompassed workers. *See also* Section VI.E; Kaufman, ¶¶ 538-546.

Alternatively, each reference is reasonably pertinent to any purported problem in RE’835, namely, of controlling or authorizing access to a location or a region, such as by workers or railway traffic. EX1001, title, Abstract, 1:21-2:10, 2:49-3:6, 4:8-10, 4:42-46; EX1025, ¶ 20; EX1024, 6, 13-14.

The Federal Circuit construes pertinent art broadly. *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 pertinent art, including that they are in several “area[s]” underlying the purported problem for the reasons above. Kaufman, ¶¶137-157,163-172,363-374,438-450,538-546. Moreover, there are numerous reasons below for combining these references with FRA-Report, which reinforces the analogous art of such references. *See infra, e.g.*, Sections VII.A.1,C.1,D.1 at e-f.

VII. SPECIFIC GROUNDS

A. Ground 1: Claims 1-7, 9-16, 18-41 Are Obvious Over FRA-Report and Kruijswijk

1. Claim 1

a. 1[Pre]⁷

FRA-Report discloses 1[Pre].

Whether or not the preamble is limiting, FRA-Report discloses a centralized railway control system or “Central Traffic Control (CTC)” for railway control. EX1004, Vol. I: 6.

FRA-Report teaches railway workers operating a user terminal (or PDA) interface to request work authorization or block the track, *e.g.*, Form D request, from the CTC system for safety. *Id.*, Vol. I: 6 (“[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*”) (emphasis added), Abstract (“communications device ... for roadway workers ... to

⁷ The Claim Listing provided herein identifies the correspondence between claim limitations and designation labels.

request track protection” from “dispatchers at the Central Traffic Control Center”), 29, 32 (Fig. A-1) and 34 (Fig. A-3), 37, 1; Vol. II: 10-12, 16-17, 18-20.

After any work, 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.

Additionally, it was known to a POSITA for a dispatcher to operate a centralized railway control system with plural railways and interlocks. EX1001, 1:29-2:10; *see infra* p.29; Kaufman, ¶¶173-177.

b. 1[A]

FRA-Report discloses 1[A].

Claims 1[A], 10[B], and 19[B] recite a “rail personnel contact database” while independent Claims 20, 30, and 40 do not recite such a database.

FRA-Report describes that the worker PDA’s electronic contract address, such as a device ID, along with dispatcher and other worker information, are registered in a CTC database (or other storage): “***The database includes information about dispatchers, roadway workers ... Dispatchers (dispatchers.txt) ... Roadway workers (MWForemen.txt). Includes information about registered PDAs and their owner.***” EX1004, Vol. I: 39 (emphasis added), 57 (“device ID was used to identify which roadway worker was sending each request.”), 13 (“querying the database” to

respond to work authorization), 14 (Fig. 2: “Database”); Vol. II: 16 (Fig. 4); 1[B], [D]. It was known to store data in a standalone or multiple database(s) (or storage) as that is simply a design choice and known the database would store other electronic addresses, such as a MAC address or IP address. *Id.*; Kaufman, ¶¶178-183.

c. 1[B]

FRA-Report discloses 1[B].

FRA-Report discloses a railway traffic control apparatus (or 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—along with a network interface for communicating over a network (Internet) with a worker’s PDA, as shown below.

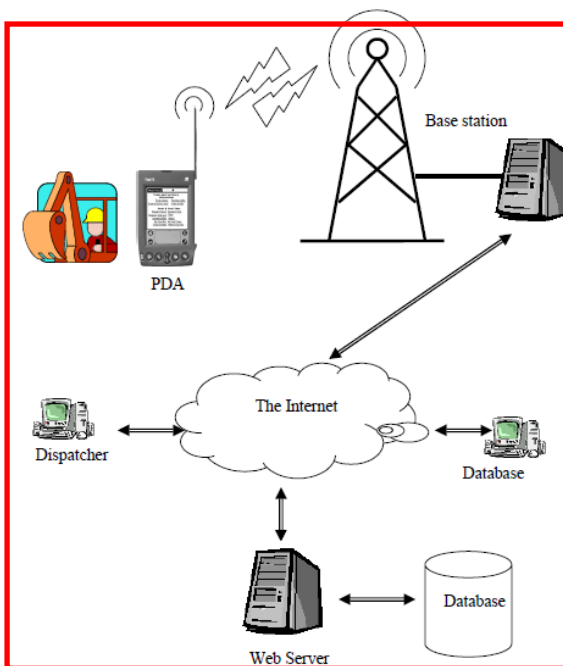


Figure 2. PDA System Architecture

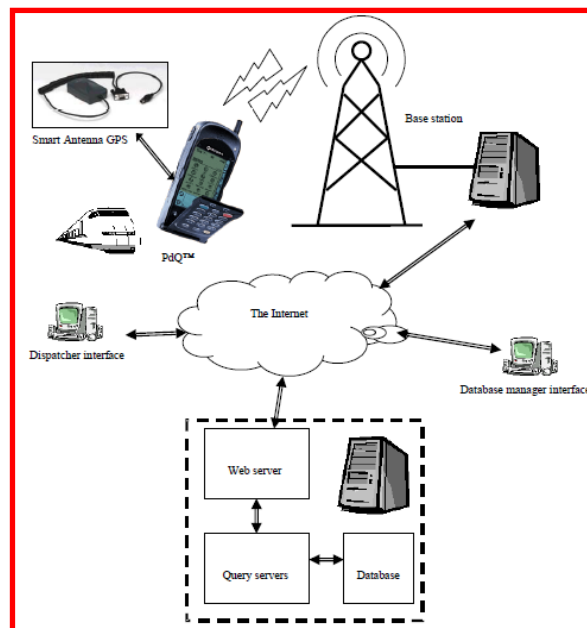


Figure 4. System Architecture

EX1004, Vol. I: 14 (Fig. 2 (annotated)), 13, 31, 36-39, 1, 6; Vol. II: 16 (Fig. 4 (annotated)), 43-46.

The railway traffic control apparatus with the dispatcher's computer, web server, and/or 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*; Vol. I: 14 (Fig. 2 (showing computers)), 31 (“dispatcher’s terminal” and query/web server described as a “computer”), 36 (“query servers used in this study were mainly written in Java (Sun Microsystems, 2001) ...”), 38-40, 11, 32-35 (Figs. A-1-A-4).

This railway traffic control apparatus provides centralized traffic control over a railway network as “dispatchers at the Central Traffic Control Center” block and unblock tracks based on requests from the worker’s mobile phone. EX1004, Vol. I: Abstract, 1 (“In *centralized traffic control* territory, *switches and signals receive commands from the dispatcher’s computer.*”) (emphasis added); 1[Pre]. In other words, the railway traffic control apparatus controls access to the railway tracks.

Specifically, the dispatcher via the railway traffic control apparatus at “Central Traffic Control (CTC)” operates or selects a track display to transmit, *e.g.*, a blocking (block signal) or unblocking (or block removal signal), to the interlocks to block or unblock the track in the railway network with a plurality of railways and interlocks.

*Each dispatcher has a workstation to control the switches and signals. This workstation also displays a representation of the track (see Figure 1). Track displays use scale compression extensively to show more details around **crucial points such as stations and interlockings.***

....

At the Traffic Control Center, the dispatcher could use the track display to protect the track segment in question using software that controlled various switches and signals in the field. . . . Operation of these switches is restricted and the protected track will display stop [block] signals at both ends.

EX1004, Vol. II: 10-12 (emphasis added), 18 (“dispatcher would communicate with the roadway worker through the computer aided dispatch (CAD) system.”), 28, 68, 67 (“**Block Signal:** A fixed signal [stop] displayed to trains at the entrance”) (emphasis in original); Vol. I: 6, Abstract, 1; 1[Pre].

Figure 1 below provides a track display for a railway network with a plurality of railways and interlocks, where the dispatcher selected the blue tracks to control the corresponding interlocks such that they are “protected for use” or blocked while the selected tracks in green have been “cleared” or unblocked.

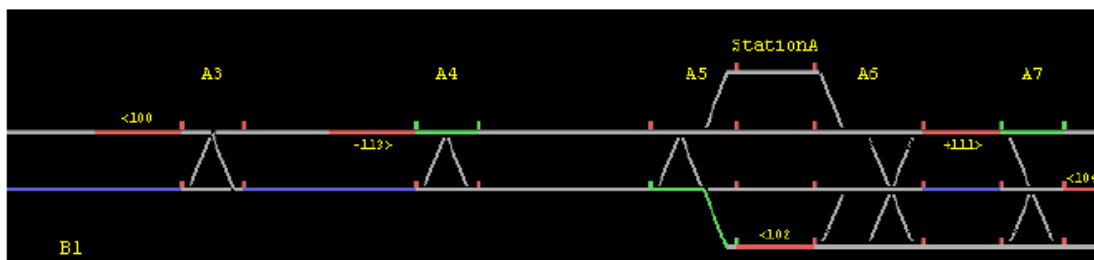


Figure 1. Track Chart Display

Id., Vol. II: Fig. 1.

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., Table 2, 1 (“*the track equipment provides dispatchers with information about signal states, switch states, and train location.*”) (emphasis added); Vol. I: 40 (Fig. A-5).

FRA-Report teaches the railway traffic control apparatus includes a network interface through which it communicates via a network, *e.g.*, “Internet,” with the worker’s device, such as for work authorization. *Id.*, Vol. I: 14 (Fig. 2 (“Internet ... Base station”)), 13 (“[T]he server redirected the message to the appropriate destination via the Internet”); Vol. II, 16 (Fig. 4). 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. Additionally, because the dispatcher is remotely controlling interlocks (e.g., switches and signals), the railway traffic control apparatus would have included a network interface to communicate with them.

Regardless, RE'835 concedes a CTC system was known to control interlocks for blocking and unblocking a track in a railway network from a dispatcher's display. EX1001, 1:29-2:10. Even Railware's expert believes the below 2010 public document shows a "control center where dispatchers control train traffic using a CTC system."



EX1025, ¶¶ 14, 22-23.

Accordingly, FRA-Report teaches (and it was known) 1[B]. Given the foregoing, FRA-Report teaches 1[B] under Railware's construction of railway traffic control apparatus (or railway control apparatus), which is "broadly understood and encompasses a number of hardware ... software," given FRA-Report discloses a dispatcher's console or computer and even other hardware and software to control track blocking and unblocking, as shown above. *See* 1[A]; *supra* p.11.

Additionally, FRA-Report discloses SEPTA's construction of a railway traffic control apparatus because FRA-Report teaches a CTC "console used by the train dispatcher" for, *e.g.*, blocking and unblocking tracks, as shown above. *See supra* p.11. Otherwise, it is simply a design choice in the FRA-Report for the dispatcher's console to contain software and hardware to perform the railway traffic control apparatus functionality, and that software and hardware would be stored on one computer or divided between different servers to perform functions.

FRA-Report discloses the railway worker's mobile device or user terminal displays information on a user interface, *e.g.*, "Main Menu," "My Form D's," "My Foul Time," "Clear," and "Cancel/Fulfill," among many others, communicated over the network from the railway traffic control apparatus, as shown in Figures A-1 and A-3 below.

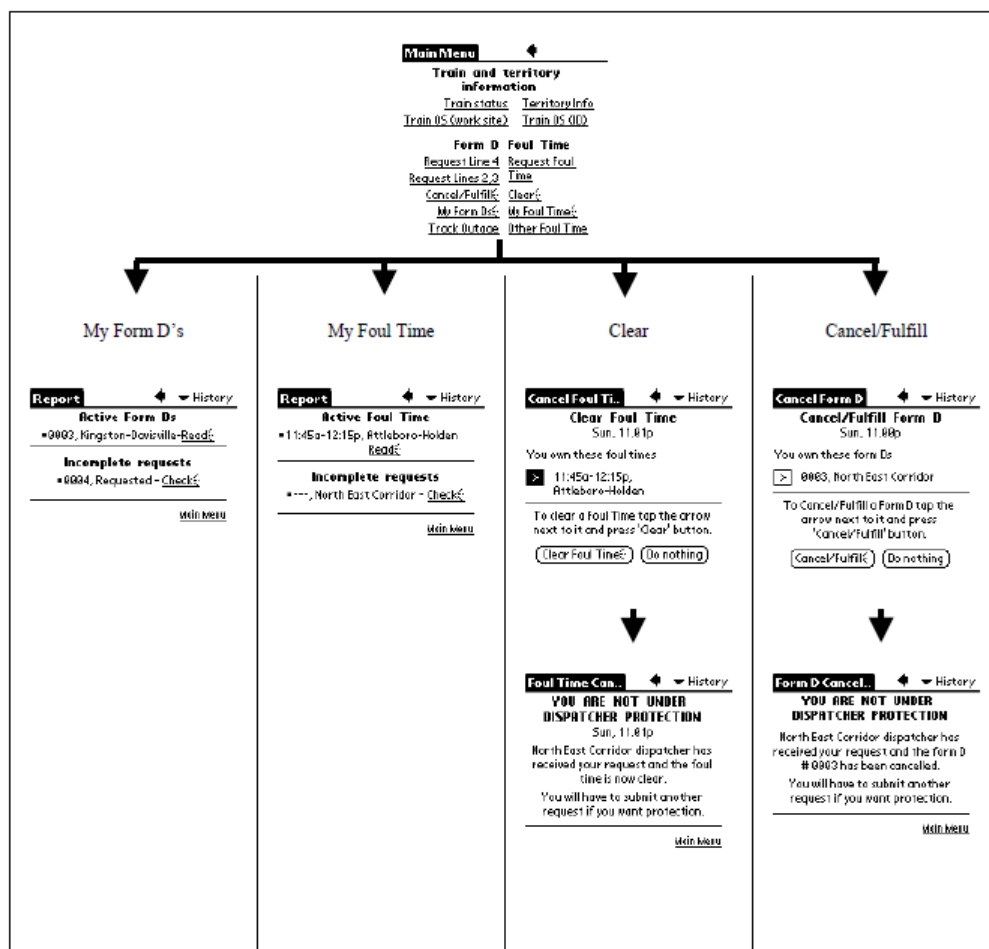


Figure A-1. PDA Screen Shots (1)

EX1004, Vol. I: 32 (Fig. A-1).

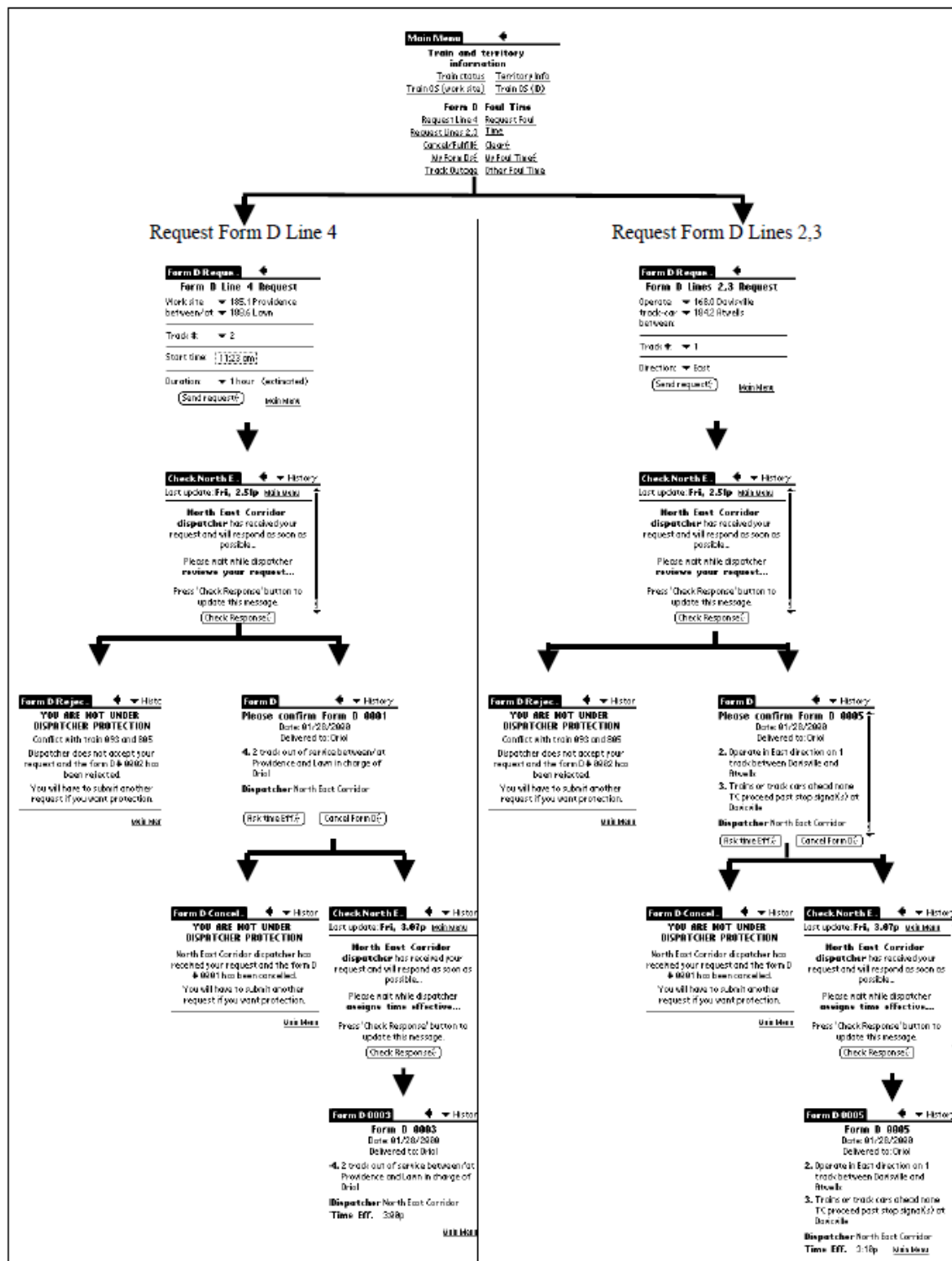


Figure A-3. PDA Screen Shots (3)

Id., Vol. I: 34 (Fig. A-3), 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 ... returns the requested information to the PDA”).

Thus, FRA-Report teaches 1[B], including a “user terminal” under Railware and SEPTA’s construction because the worker’s device receives and displays information, and Railware believes “user terminal” is satisfied with “‘*any communication device*’ and not necessarily a ‘mobile user device’.” *See supra* p.12; Kaufman, ¶¶184-200.

d. 1[C]

FRA-Report discloses 1[C].

Claims 1 and 10 recite a block placing part, a code generation part, and a block removal part. Claim 19 recites a block placing part while Claims 20, 30, 40 do not recite these parts.

RE’835 discusses implementing such “parts” as software and/or hardware. EX1001, 2:49-36. FRA-Report implements these three parts in software and/or hardware via the railway traffic control apparatus’ processor. *See* 1[B]; EX1004, Vol. I: 14 (Fig. 2), 31, 36-39, 40 (Fig. A-5).

The worker selects a Form D work authorization link on the worker’s mobile device 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—or request to block

the track—to the railway traffic control apparatus. EX1004, Vol. I: 32 (Fig. A-1), 34 (Fig. A-3), 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); 1[Pre], 1[B].

FRA-Report teaches plural railways in a railway network that is managed by central control from the railway traffic control apparatus, including controlling one or more interlocks. *See* 1[B]. And based on the request to block the track, the railway traffic control apparatus’ processor executes a block placing part (software / hardware) to place a block and block the track section (or “out of service”) by transmitting signals to the interlocks in the railway network. *Id.*; EX1004, Vol. I: 38, 36-37, 6 (if “the dispatcher grants permission to work, (under ... Form D ...) the track is placed off-limits (blocked) for other uses.”); Vol. II: 10-12.

This block placing part software/hardware is also shown in Figure A-3 where the railway traffic control apparatus’ processor 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.” EX1004, Vol. I: 34 (Fig. A-3) (emphasis added).

While the track is blocked (blue in Figure 1, *supra* pp.27-28), 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 ... [means the] track has been protected When *the dispatcher gives track authority to a work crew, the dispatcher temporarily loses control over that section of track.*”) (emphasis added), 12; Vol I: 6 (“blocking a track protects the roadway worker since it prevents the dispatcher from routing trains on that track.”), 32 (Fig. A-1), 34; 1[E].

Regardless, RE’835 concedes that CTC was known to control interlocks to block the track. EX1001, 1:29-2:10; Kaufman, ¶¶201-215.

e. 1[D]

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

FRA-Report teaches the railway traffic control apparatus (CTC system or CTC dispatcher’s console discussed in 1[B]) retrieves the worker’s electronic contact address from the database. EX1004, Vol. I: 57 (“Each Palm VII device ID was used to identify which roadway worker was sending each request.”), 13 (“work authorization was sent to the dispatcher while an *information request was answered by the system ... by querying the database.*”) (emphasis added), 39, 38, 34 (Fig. A-3) (“Delivered to: Oriol”); 1[A] (database stores workers).

The railway traffic control apparatus generates a Form D number and transmits information (*e.g.*, track-related) to the worker's PDA or retrieved 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 (“Form D line 4”) (emphasis added), 34 (Fig. A-3) (“Delivered to: Oriol”), 57.

FRA-Report teaches other examples of the railway traffic control apparatus retrieving the worker's electronic contact address in communicating with and displaying information over the network on the worker's device.

For instance, Figure A-3 or “PDA Screen Shots (3)” below shows retrieving the worker's electronic contact address to block the track (“2 track out of service”) for the worker (“Oriol”) and transmitting that information to the worker's PDA: *“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.”* *Id.*, Vol. I: 34 (Fig. A-3) (emphasis added), 32 (A-1).

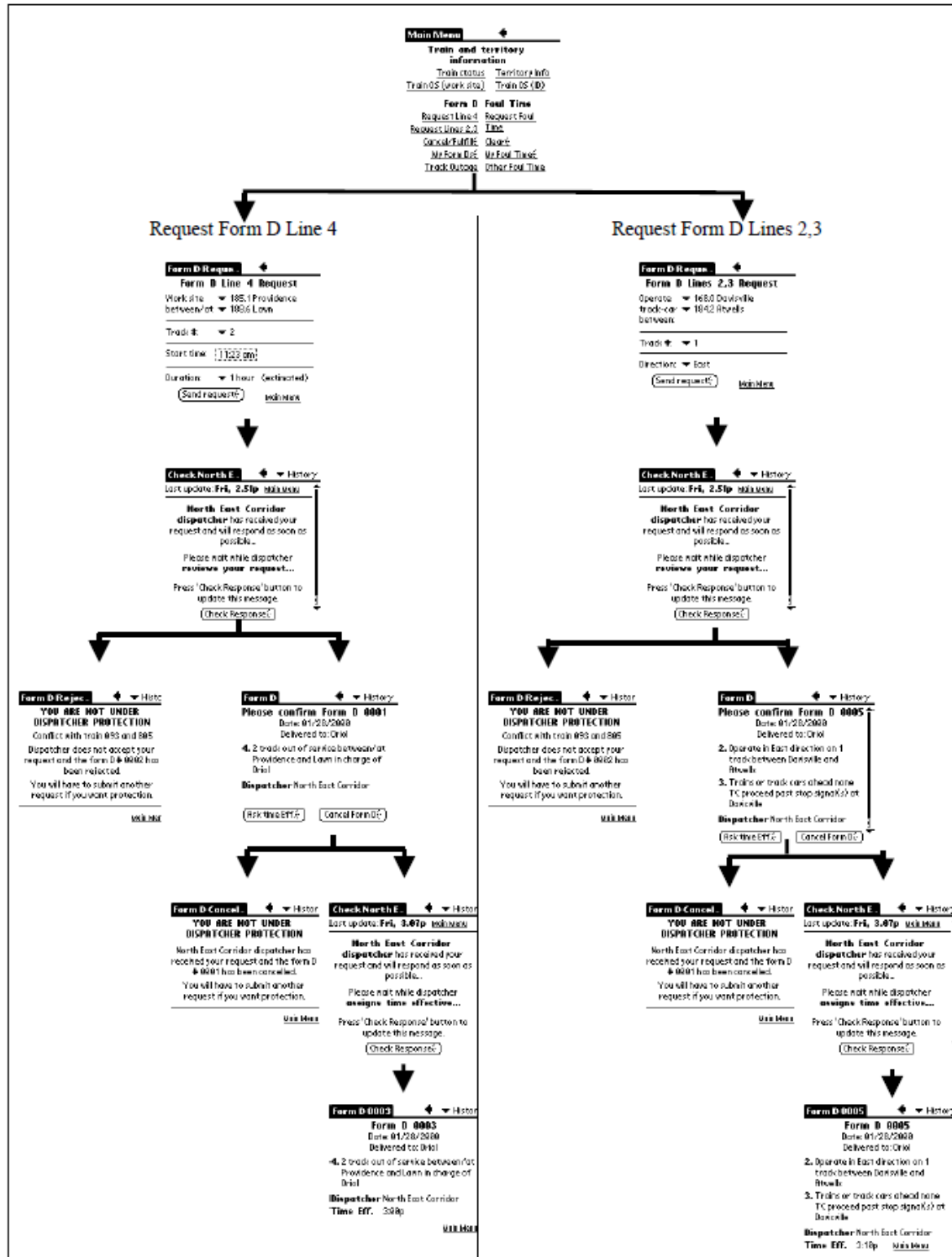


Figure A-3. PDA Screen Shots (3)

As mentioned, Claims 1 and 10 recite a code generation part. A POSITA would have understood the hardware and software used to place a block would have

included corresponding hardware (*e.g.*, processor) and software to generate the code or code generation part given the railway traffic control apparatus CAD system controls switches and signals to block and unblock the track. *See* 1[B], 1[C]; Kaufman, ¶¶216-222.

i. FRA-Report and Kruijswijk Combination

FRA-Report discloses the dispatcher operates the track display and via the railway traffic control apparatus blocks the track, retrieves the worker's electronic address from the database, as well as generates and transmits information (*e.g.*, track-related) to the worker's electronic contact address or PDA. *See* 1[Pre]-[D].

Kruijswijk supplies the claimed code such that the dispatcher in FRA-Report operates the track display via the railway traffic control apparatus to block the track as well as retrieve the worker's electronic contact address, generate (code generation part: hardware, *e.g.*, processor, and/or software), and transmit the claimed code (as taught in Kruijswijk) to the 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." 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, over the Internet. EX1005, 8:21-25, 11:8-17, Abstract, 13:25-28, 5:3-6, 3:29-34.

Thus, FRA-Report and Kruijswijk disclose and render obvious 1[D]. Given the foregoing, they also disclose this limitation under the Board’s analysis of the claimed code (*see supra* pp.10-11): [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 (“verification data for verifying that a code entered indeed is the personal secret code of the respective user.”), 7:1-17.⁸

Also, FRA-Report and Kruijswijk disclose and render obvious 1[D] under Railware’s construction of the claimed code or “code that is not readily available to

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 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 (“In an embodiment ... transferring the personal secret code to the second user”), 9:27-10:4, 8:14-35, 6:1-9, 7:1-17; Kaufman, ¶226 n.4.

the user of the railway [traffic] control apparatus (*i.e.*, the dispatcher)” for above reasons [a]-[c] as the code taught in Kruijswijk is secret to the relevant person or “not readily available” to dispatcher. Reinforcing this is that 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 also disclose and render obvious 1[D], including under the Board and Railware’s understanding of the claimed code, given a POSITA would have had a motivation to combine and reasonable expectation of success to implement Kruijswijk as a 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 known before the Priority Date. 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, 3:61-4:3, Abstract, 5:25-30.

Thus, it would have been predictable in implementing Kruijswijk as the claimed 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 disclosure and expert testimony, a POSITA would “have found it obvious” to modify the reference to the “claimed switchgear configuration”); *MyPac Holdings Ltd. v. Samsung Elecs. Co.*, No. 2023-2024, 2025 WL 1189920, at *5 (Fed. Cir. Apr. 24, 2025) (expert “cited specific prior art references that corroborated” that claim limitation “well known”) (citation omitted).

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

It was known to save a generated code in a database (or storage) and verify codes. 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; Kaufman, ¶¶223-234, 57-77.

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

A POSITA would have had a motivation to combine and reasonable expectation of success because they involve railway technology and worker safety. *See* Sections VI.A.3, B, F; EX1005, 12:17-21.

Given CTC systems and secret-code verification systems were known, modifying FRA-Report with 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, 37-38 (May 5, 2025) (citation omitted); *see supra* pp.29, 40-42; 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 such technologies would have been applied to augment worker safety. EX1028, 4 (“the

potential exists to develop portable roadway worker devices that combine technologies”).

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 (“develop intelligent railroad systems”); 1[B], [D]-[E]; *Honeywell Int’l Inc. v. 3G Licensing, S.A.*, 124 F.4th 1345, 1356 (Fed. Cir. 2025) (“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, the worker in 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 handshake or two-way communication over radio. EX1028, 14-15.

FRA-Report urges a need 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. EX1004, Vol. I: 57-58.

A POSITA would have appreciated that modifying FRA-Report with Kruijswijk would have had a reasonable expectation of success. FRA-Report built and tested a railway worker and dispatcher CTC system containing a server(s) with software and worker mobile device. 1[Pre]-[C]. FRA-Report notes that “[t]he system is designed to be highly configurable.” EX1004, Vol. I: 41; 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.

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 claimed code taught in Kruijswijk given the worker’s existing user interfaces and it is a design choice by a POSITA. *See* 1[B].

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, 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 message would have included an embedded link to activate the return of the code. Kaufman, ¶¶235-244, 57-77.

f. 1[E]

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

FRA-Report describes that the “worker can retrieve a list of Form Ds ... *under his/her authority* ... [and] [*f*]following 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, 39, 31, 32 (Fig. A-1), 16 (Fig. 4); Vol. II: 15, 18; 1[B]-[C].

Selecting the “Cancel/fulfill” link transmits information to the railway traffic control apparatus block removal part (software and/or hardware), which unblocks the track by transmitting a block removal or unblocking signal to the interlock(s). See 1[B].

This is shown in Figure A-1, particularly “*Cancel/Fulfill Form D ... You own these form Ds 0003, NorthEast Corridor ... Cancel/Fulfill ... Form D Cancel ... YOU ARE NOT UNDER DISPATCHER PROTECTION* [track unblocked] NorthEast Corridor *dispatcher has received your request and the form D # 0003 has been cancelled.*” EX1004, Vol. I: 32 (Fig. A-1) (emphasis added), 37 (cancel/fulfill “to actually cancel” the Form D or unblock the track), 6.

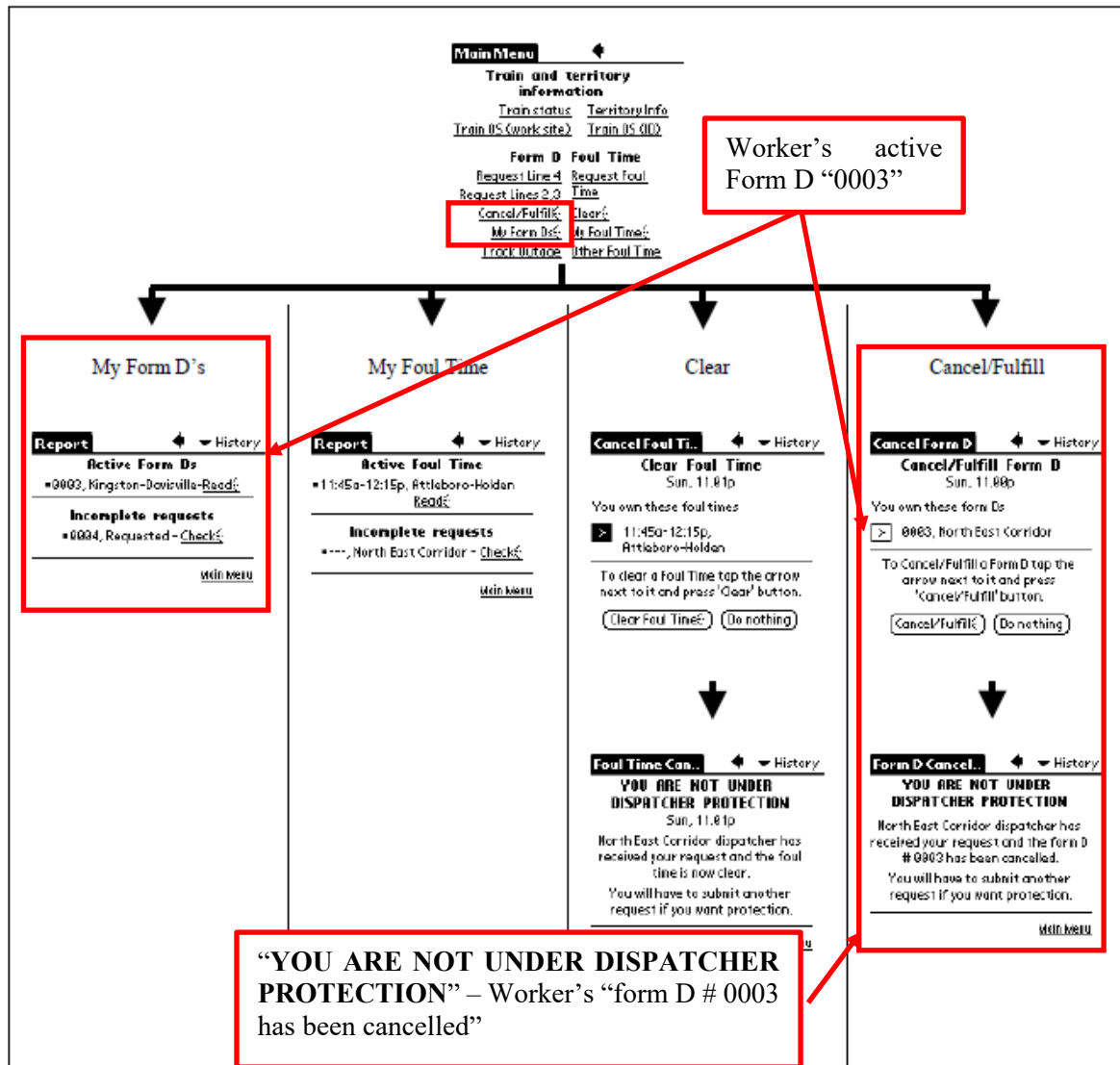


Figure A-1. PDA Screen Shots (1)

EX1004, Vol. I: 32 (Fig. A-1) (annotated).

As mentioned, Claims 1 and 10 recite a block removal part. A POSITA would have understood the hardware and software used to place a block would have included corresponding hardware (*e.g.*, processor) and software to remove the block or block removal part given the railway traffic control apparatus CAD system

controls switches and signals to block and unblock the track. *See* 1[B]-[D]; Kaufman, ¶¶245-249.

i. FRA-Report and Kruijswijk Combination

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

Kruijswijk supplies transmitting the claimed 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 traffic control apparatus, which by centralized control operation will only unblock the track once the transmitted code is entered by the dispatcher or automatically by the railway traffic control apparatus.

Specifically, Kruijswijk teaches “after the repair of [the] railroad track” (EX1005, 12:17-18), the worker “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, 12:13-21 (worker “safety checks”).

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

Additionally, FRA-Report and Kruijswijk also disclose and render obvious 1[E] given a POSITA would have had a motivation to combine and reasonable expectation of success for two reasons to implement from Kruijswijk the transmitted claimed code in FRA-Report to the railway traffic 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 (worker enters “a specific code before ... 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, *e.g.*, a locking mechanism), 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 problems in the art which would have predictably led to implement from Kruijswijk the transmitted

secret code in FRA-Report to the railway traffic 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] given Railware has expressed this limitation includes a person (“Chief Traffic Controller”) retrieving the code from the railway traffic control apparatus’ storage when a worker is unavailable to transmit the code. EX1024, 21-22; EX1025, ¶¶118-120; *see supra* pp.10-11 (“unavailable”). Such a code lookup would have been obvious to try, where another person obtains the saved code from storage in the railway traffic control apparatus and enters the code (or provides it to the dispatcher) to release the track block. It was routine and predictable to store codes and use them to control another action, such as worker safety or control access. *See supra* p.42.

Claims 1[E], 10[C], and 19[C] recite removing the block “only upon entry of the removal code” while independent Claims 20, 30, 40 do not recite such code entry.

Railware asserted the code can be manually entered by the dispatcher or automatically “without dispatcher intervention.” EX1024, 11-12; EX1025, ¶¶ 296, 312-313, 321, 341, 350, 358.

Nonetheless, to the extent a dispatcher must enter the code, a POSITA would have had a motivation to combine and reasonable expectation of success for the dispatcher to enter the worker’s transmitted code. This would have ensured the dispatcher is alerted to the information provided, prevented the track block from being (improperly) 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 using the transmitted code given FRA-Report already automatically unblocks the track based on the worker and it is a design choice for efficiency. *See supra* pp.45-49.

Under either method, FRA-Report’s railway traffic control apparatus would verify the generated code stored in the database (or other storage) with the worker’s transmitted code entered by the dispatcher or automatically and if the code matches, then the track is unblocked, otherwise the track remains blocked. *See supra* p.42.

Accordingly, FRA-Report and Kruijswijk disclose and render obvious 1[E]. Also, Railware’s broad understanding of “user terminal” and “from the [user] terminal” (latter in Claims 20, 30, 41) reinforce FRA-Report and Kruijswijk teach

1[E] given for the former, “any communication device” can be used while the latter, the “claims are ... agnostic as to how the code is transmitted to the railway control apparatus” *See supra* p.12; Kaufman, ¶¶250-267, 57-77.

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, 29, 40-43; Sections VI.A.3, B-F.

Likewise, FRA-Report and Kruijswijk involve railway technology and worker safety including verification. *See supra* Sections VI.A.3, B. Thus, a POSITA would have combined them as it would strengthen FRA-Report’s goals to “improve roadway worker safety and productivity” (EX1004, Vol. I: Preface) and implement “a verification system that prevent[s] or minimize[s] common human error.” *Id.*, 9, 27. A “handshake” or verification protocol, where the worker unblocks the track with the code taught in Kruijswijk, would thus have been obvious to try. *See supra* p.43; 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,”

including a password-based one. EX1004, Vol. I: 57-58. A POSITA would have been motivated to combine FRA-Report and Kruijswijk given FRA-Report itself discloses a readiness to receive improvements—including password-based ones—towards verifying a track worker. *Id.*

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the 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 traffic 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 means to unblock the track and such were 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 software to unblock a track at the worker’s request from a mobile device. *See* 1[A]-[C], [E]. FRA-Report notes that “[t]he system is designed to be highly configurable.” EX1004, Vol. I: 41; Kaufman, ¶¶268-273, 57-77.

2. Claims 10, 19, 20, 30

a. 10[Pre], 19[Pre], 20[Pre], 30[Pre]

See 1[Pre] and 1[B]; Kaufman, ¶274.

b. 10[A], 19[A], 20[A], 30[A]

See 1[B]-[C]; EX1004, Vol. II: 10-12, Fig. 1, Table 2; Kaufman, ¶¶275,279,283,299.

c. 10[B], 19[B], 20[B]-[C], 30[B]-[C]

See 1[A] and [D].

Claims 20[B] and 30[C] recite a “secret release code,” and 40[C] recites a “secret code.” Board and Railware treat them the same as “removal code” in Claims 1,10. *See supra* pp.9-11. FRA-Report and Kruijswijk teach them. *See* 1[D].

Claims 20[B] and 30[B] recite generating the claimed code “associated with the blocked one or more sections of railway track,” while 40[C] recites “associated with the selected track sections.”

FRA-Report and Kruijswijk describe, upon a worker’s request, the railway traffic control apparatus blocks a track (selected on the track display) associated with the worker as well as generates and transmits a code to the worker. *See* 1[B]-[D]; *see also* EX1004, Vol. I: 34 (Fig. A-3) (“Delivered to: Oriol ... 2 track out of service between/at Providence and Lawn in charge of Oriol.”), 32 (Fig. A-1); Kaufman, ¶¶276,280,284-291,300-301.

d. 10[C], 19[C], 20[D]-[E], 30[D]-[E]

See 1[D]-[E].

FRA-Report teaches “via the network” in Claims 20[D], 28, 30[D], 38, 41[A] under Railware and SEPTA’s constructions because the worker operating the PDA transmits the code to the railway traffic control apparatus over “one or more networks” or “the same network” used to transmit the code to the worker. *See supra* p.13 (Railware: “one or more networks”; SEPTA: “the same network”); 1[B], 1[D]-[E]; EX1004, Vol. I: 14 (Fig. 2).

A POSITA would have recognized that alternatively the railway traffic control apparatus would transmit the code to the worker and return the code to it over different networks in FRA-Report and depending on the needs of the system, such as for efficiency and costs.

FRA-Report teaches “from the terminal” in Claims 20[E] and 30[E] and “from the user terminal” in Claim 41[A] under Railware and SEPTA’s constructions given the worker from the mobile device transmits the claimed code to the railway traffic control apparatus and according to Railware’s expert, the “claims are ... agnostic as to how the code is transmitted.” EX1025, ¶¶328, 356, 358; *see supra* p.12; 1[E]; Kaufman, ¶¶277,281,292-297,302-303.

3. Claim 40

Claim 40 does not require that the worker return the secret code to unblock the track.

a. 40[Pre]

See 1[Pre]; Kaufman, ¶305.

b. 40[A]

See 1[Pre] and 1[B]; Kaufman, ¶306.

c. 40[B]

See 1[B]-[C]; Kaufman, ¶307.

d. 40[C]

See 1[B]-[D]; Kaufman, ¶308.

e. 40[D]

See 1[D]-[E] (discussing saving code); Kaufman, ¶¶309-310.

f. 40[E]

See 1[C]-[D]; EX1004, Vol. I: 38, 39, 57, Fig. A-3. The code is associated with the worker because the code is generated based on the worker's request to block the track and transmitted to the worker. *See* 1[C]-1[D]; Kaufman, ¶¶311-312.

g. 40[F]

See 1[B]-[C]. FRA-Report blocks a track by transmitting a block signal to the interlocks which was known as well. *Id.*; EX1001, 1:29-2:10; EX1004, Vol. II: 1, 10-11 (and Fig. 1 with Table 2), 12, 67; Vol I: 6 (“signals ... for the blocked track will display a stop signal at both ends”), 8; Kaufman, ¶¶313-315.

h. 40[G]

See 1[D]; Kaufman, ¶316.

4. Dependent Claims

FRA-Report and Kruijswijk render obvious dependent claims 2-7, 9, 11-16, 18, 21-29, 31-39, 41. Kaufman, ¶317.

a. Claims 2, 11

See 1[B]-[C], 40[F].

FRA-Report teaches the dispatcher operates an interface to specify instructions to the railway traffic control apparatus to block track sections associated with a worker. *See* 1[B]-[C]; EX1004, Vol. I: 34 (Fig. A-3: “track out of service between/at Providence and Lawn in charge of Oriol.”).

FRA-Report shows below a dispatcher assigning a worker, “Oriol,” to the track sections, “81.5 Branford and 90.4 Guilford”:

Requested Active Rejected and cancelled	
Requested Form Ds • 0003, Oriol - Read • 0002, Oriol - Read	Requested Foul Time • 10.00a-10.30a, Oriol - Read
Form Ds waiting for time effective • 0004, Oriol - Read	Form D 0003 is Requested Foreman Oriol would like to work in 1 track at/between Branford and Gulford Desired starting time: 11.00a Expected duration of work: 1 hour Form D #: 0003 Delivered to: Oriol Date: 01/28/2000 Line 4: 1 track out of service between/at 81.5 Branford and 90.4 Guilford in charge of Oriol Train: North East Corridor Dispatcher: Please select 'Confirm' to grant permission to work or 'Deny' to disregard this form D request and then press 'Send Response' ☒ Confirm ☐ Deny Reason: Send Response

Figure A-5. Dispatcher Interface

EX1004, Vol. I: 40 (Fig. A-5).

A POSITA would have been motivated with a reasonable expectation of success to associate on the track display (or another interface) the railway worker with the track blocked because it would have been a design choice and known. *See* 1[A]-[B]; EX1001, 1:29-2:10.

FRA-Report teaches “railway traffic controller” under Railware and SEPTA’s constructions because a dispatcher operates the track display to block track sections, among other functions. *See* 1[A]-[B]; Kaufman, ¶¶318-324.

b. Claims 3, 12

See 1[B]-[C], 40[D].

FRA-Report discloses registering block identifying information in a database (or other storage). *See* 1[B]-[C]; EX1004, Vol. I: 14, 31 (database stores “out of service track under Form D”), 39, 34.

FRA-Report’s railway traffic control apparatus generates the code associated with the blocked track and would store the code in the database (or other storage) for later verification. *See* 1[D].

Also, a POSITA would have had a motivation to combine and reasonable expectation of success to register the claimed information in a database (or other storage) to enhance safety by determining if the correct procedures were followed; analyzing any issue; and/or training others, as well as storing data is known or a design-choice. Kaufman, ¶¶325-330.

c. Claims 4, 13

FRA-Report discloses a railway control database that registers the dispatcher who placed the block and the worker who requested the block. EX1004, Vol. I: 14 (“The database contained track out of service under Form D and territory information ... dispatcher in charge”), 39 (stores “dispatchers, roadway workers”), 31, 32 (Fig. A-1), 34, 38.

FRA-Report’s database likewise stores block identifying information, including block limits identifying the blocked track sections (“track out of service” above); notes specifying reasons for the block (*e.g.*, Form D or worksite description);

and date and time block was placed. *See* Claims 3, 12; EX1004, Vol I: 34-35 (Figs. A-3–A-4) (“Start Time: ... Duration: ... Date: ...”; shows reasons for work and dispatcher), 32.

Also, a POSITA would have had a motivation to combine and reasonable expectation of success to store the claimed information to enhance safety by determining if the correct procedures were followed; analyzing any issue; and/or training others, as well as storing data is known or a design-choice. Kaufman, ¶¶331-335.

d. Claims 5, 14

See 1[C]-1[E]; Kaufman, ¶336.

e. Claims 6, 15

See 1[C]-1[E]; Claims 5, 14; Kaufman, ¶337.

f. Claims 7, 16

It would have been obvious for a dispatcher to enter the code in an interface to unblock the track. *See* 1[E].

A POSITA would have been motivated with a reasonable expectation of success for the dispatcher to confirm from the worker the track sections were cleared. This would have provided another level of protection to ensure all workers have left the track before unblocking the track, which was known. 1[B], 1[E]; EX1004, Vol. II: 10-12, Fig. 1, Table 2; EX1029, Figs. 6D, 5H, 25:4-9, 31:2-6.

FRA-Report teaches storing block identifying information, including a database (or other storage) for registering the blocked track, date and time block was placed, and worker associated with the blocked track or a POSITA, as discussed above, would have been motivated with a reasonable expectation of success to store them. *See* Claims 2, 11; 3, 12; 4, 13.

A POSITA would have been motivated with a reasonable expectation of success to generate and store block removal information, such as the date and time at which the block was removed, the user who entered the removal code, and confirmation that the track sections have been cleared to enhance safety by determining if the correct procedures were followed; analyzing any issue; and/or training others, as well as storing data is known or a design-choice. *See* 1[A]-[C]; Claims 2, 11, 3, 12, 4, 13; Kaufman, ¶¶338-343.

g. Claims 9, 18; 27, 37; 28, 38; 29, 39

The combined references teach a railway traffic control apparatus which generates a code and transmits it and other information as a message to the worker's electronic contact address. *See* 1[D]-[E]. The worker activates the "Cancel/Fulfill" embedded link which transmits the code to the railway traffic control apparatus, which unblocks the track. *Id.*

Alternatively, the code would be transmitted to the worker via text and email message. *Id.* The worker would transmit the code to the railway traffic control

apparatus to unblock the track upon the worker calling, or texting or emailing a message (such as via an embedded link activated to transmit the code). *Id.*

As another option, upon selecting the embedded link, the system would prompt the worker to enter the code and then transmit it. *Id.*; Kaufman, ¶¶344-349.

h. Claims 21, 31

See 1[B]-[C]; Claims 22, 32; EX1001, 1:29-2:10; EX1004, Vol. II: 10-12, Fig. 1, Table 2; Vol. I: 6, 8; Kaufman, ¶350.

i. Claims 22, 32

The railway traffic control apparatus places a block by causing the interlocks to display a stop signal. *See* 1[B]-[C], 40[F]; EX1004, Vol. II: 11-12; Vol. I: 6, 8; Kaufman, ¶351.

j. Claims 23, 33

See 1[D]-[E]; Kaufman, ¶352.

k. Claims 24/34

See 1[D]-[E], 40[D]; Claims 3, 12; Kaufman, ¶353.

l. Claims 25, 35

A POSITA would have been motivated with a reasonable expectation of success to generate and store block removal information. *See* Claims 7, 16.

A POSITA would have been motivated to generate and store such information in response to removing a track block to enhance safety by determining if the correct

procedures were followed (*e.g.*, correct block placed or removed); analyzing any issue; and/or training others, as well as storing data is known or a design-choice. Kaufman, ¶¶354-357.

m. Claims 26, 36

FRA-Report and Kruijswijk teach a secret removal code. *See* 1[D]; *see supra* pp.10-11. A POSITA would also have been motivated with a reasonable expectation of success to generate block removal information, as discussed above, consisting of the date and time when the block was removed and person (dispatcher) who entered the code to remove the block. *See* Claims 7, 16; Kaufman, ¶¶358-359.

n. Claim 41

See 1[B], [E]; Kaufman, ¶360.

B. Ground 2: Claims 1-7, 9-16, 18-41 Are Obvious Over FRA-Report, Kruijswijk, and Macey

1. Claim 1

a. 1[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶375.

b. 1[A]

See Ground 1, 1[A]; Kaufman, ¶376.

c. 1[B]

See Ground 1, 1[B]; Kaufman, ¶377.

d. 1[C]

See Ground 1, 1[C]; Kaufman, ¶378.

e. 1[D]

See Ground 1, 1[D]; Kaufman, ¶379.

f. 1[E]

FRA-Report, Kruijswijk, and Macey disclose and render obvious 1[E].
Kaufman, ¶¶380-381.

i. FRA-Report, Kruijswijk, and Macey Combination

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway traffic control apparatus, which by centralized control operation unblocks the track. *See* Ground 1, 1[E], 1[B]-[C]. Kruijswijk teaches the claimed code. Macey supplies the implementation of unblocking the track only

based on the worker transmitting a secret code (*see supra* p.48, Section VI.D) to a central system.

Thus, following Macey's implementation, the worker would transmit the claimed code as taught in Kruijswijk to the railway traffic control apparatus in FRA-Report, which will only unblock the track once the transmitted code is entered by the dispatcher or automatically. *See* Ground 1, 1[E].

Additionally, a POSITA would have been motivated to combine with a reasonable expectation of success FRA-Report and Kruijswijk with Macey's implementation because it was known to a POSITA the problem of protecting workers, a worker controlling a work zone, and one-time code. *See supra* pp.48-49.

It would have been obvious to automatically unblock the track or dispatcher enters the code (or chief traffic controller retrieving the code from storage if the worker is unavailable). *See supra* pp.10-11, 49-50; Kaufman, ¶¶382-386,57-77.

ii. Motivation to Combine FRA-Report, Kruijswijk, 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. *See supra* pp.5, 29, 40-43; Sections VI.A.3, B-F.

FRA-Report's "verification system" and goal to "minimize[] common human error" further enhance such motivation for the FRA-Report, Kruijswijk, and Macey

combination. EX1004, Vol. I: 9, 27. A “handshake” protocol, where the worker unblocks the track with the code taught in Kruijswijk, would thus have been predictable. *See supra* p.43; EX1028, 4, 14-15. Macey teaches verifying the user with a secret code. EX1007, 15:16-35, 20:31-37.

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 code. *Id.*

Moreover, they all involve railway technology and worker device communication with a central railway system (*see* Sections VI.A.3, B, D, F) and thus a POSITA would have combined them as it would strengthen FRA-Report’s goal to “improve roadway worker safety and productivity.” EX1004, Vol. I: Preface; Ground 1, 1[E].

Alternatively, a POSITA would have been motivated to modify FRA-Report to transmit the claimed code upon the worker selecting the “Cancel/Fulfill” link by phone call, or text or email message to the railway traffic control apparatus to unblock the track. *See supra* p.52.

Modifying FRA-Report and Kruijswijk with Macey’s implementation would have had a reasonable expectation of success given the hardware and software in the FRA-Report. *See supra* p.44; Kaufman, ¶¶387-392,57-77.

2. Claims 10, 19, 20, 30

a. 10[Pre], 19[Pre], 20[Pre], 30[Pre]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶¶393,397,401,407.

b. 10[A], 19[A], 20[A], 30[A]

See Ground 1, 1[B]-[C]; EX1004, Vol. II: 10-12, Fig. 1, Table 2; Kaufman, ¶¶394,398,402,408.

c. 10[B], 19[B], 20[B]-[C], 30[B]-[C]

See Ground 1, 1[A], [D], and 10[B], 19[B], 20[B]-[C], 30[B]-[C]; Kaufman, ¶¶395,399,403-404,409-410.

d. 10[C], 19[C], 20[D]-[E], 30[D]-[E]

See 1[E]; Ground 1, 1[D]-[E] and 10[C], 19[C], 20[D]-[E], 30[D]-[E]; Kaufman, ¶¶396,400,405-406,411-412.

3. Claim 40

a. 40[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶414.

b. 40[A]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶415.

c. 40[B]

See Ground 1, 1[B]-[C]; Kaufman, ¶416.

d. 40[C]

See Ground 1, 1[B]-[D]; Kaufman, ¶417.

e. 40[D]

See Ground 1, 1[D], 40[D]; Kaufman, ¶418.

f. 40[E]

See Ground 1, 1[C]-[D]; Kaufman, ¶419.

g. 40[F]

See Ground 1, 1[B]-[C], 40[F]; Kaufman, ¶420.

h. 40[G]

See Ground 1, 1[D]; Kaufman, ¶421.

4. Dependent Claims

For the reasons in Ground 1, FRA-Report, Kruijswijk, and Macey disclose and render obvious dependent claims 2-7, 9, 11-16, 18, 21-29, 31-39, 41 (*see supra* pp.56-62), except here the FRA-Report and Kruijswijk are combined with (and follow) Macey's implementation to only remove the track block in FRA-Report with the worker's transmitted code (taught in Kruijswijk). 1[E]; Kaufman, ¶¶422-436.

C. Ground 3: Claims 1-7, 9-16, 18-41 Are Obvious Over FRA-Report and Schmitz

1. Claim 1

a. 1[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶451.

b. 1[A]

See Ground 1, 1[A]; Kaufman, ¶452.

c. 1[B]

See Ground 1, 1[B]; Kaufman, ¶453.

d. 1[C]

See Ground 1, 1[C]; Kaufman, ¶454.

e. 1[D]

FRA-Report and Schmitz disclose and render obvious 1[D]. Kaufman, ¶455.

i. FRA-Report and Schmitz Combination

Schmitz supplies the claimed code such that the dispatcher in FRA-Report operates the track display via the railway traffic control apparatus to block the track as well as retrieve the worker’s electronic contact address, generate, and transmit the claimed code (as taught in Schmitz) to the worker’s electronic contact address or PDA. *See* Ground 1, 1[Pre]-[D] (discussing FRA-Report).

Schmitz teaches that, upon a user’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. The server transmits this code over the Internet to an authorized user’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]. Given the foregoing, they disclose 1[D] under the Board’s understanding of the claimed code (*see supra* pp.10-11), 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 improperly “misuse” the code. EX1006, 1:11-33, 7:16-18.

FRA-Report and Schmitz disclose and render obvious 1[D] 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.10-11.

Additionally, a POSITA would have had a motivation to combine and reasonable expectation of success to implement Schmitz as the claimed code or secret code in FRA-Report because it was obvious to try given it was known to generate and transmit a secret code only received by the relevant worker before the Priority Date. *See supra* pp.40-41.

Likewise, a POSITA would have implemented Schmitz as the claimed code in FRA-Report given there were known problems and motivations in the art, such as 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.41-42; Kaufman, ¶¶456-465,57-77.

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 FRA-Report and Schmitz discuss controlling access. *See* Sections VI.A.3, C, F.

A POSITA would have modified FRA-Report with Schmitz 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, 29, 40-43; Sections VI.A.3, B-F.

FRA-Report urges a need to implement robust 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 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. A POSITA would have thus

recognized, to prevent the dispatcher from revoking a blocked track and increase security and safety, that FRA-Report would implement a “handshake” protocol. *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 hardware and software in FRA-Report. Ground 1, 1[Pre]-1[C]; *supra* p.44. Schmitz expresses the “very secure, low cost” of implementing it. EX1006, 6:24-26. Thus, the FRA-Report would have had flexibility when the code is generated, such as before or after the block is placed. *See supra* p.44.

A POSITA would have been motivated to modify FRA-Report with a reasonable expectation of success for the worker’s interface to display the claimed code taught in Schmitz given the worker’s user interfaces and it is a design choice. *See supra* p.44.

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. *See supra* p.44. As another option, text and email message would have included an embedded link to activate the return of the code. Kaufman, ¶¶466-474,57-77.

f. 1[E]

FRA-Report and Schmitz disclose and render obvious 1[E]. Kaufman, ¶475.

i. *FRA-Report and Schmitz Combination*

FRA-Report teaches the worker selects the “Cancel/fulfill” link to transmit information to the railway traffic control apparatus, which by centralized control operation unblocks the track. *See* Ground 1, 1[E], 1[B]-[C].

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

Schmitz teaches the relevant person transmitting the code to the server and, only upon receiving and verifying the code, the server allows access. Specifically, the relevant person enters this 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, 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 1[E].

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

It would have been obvious 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.10-11, 49-50. Also, Railware's broad understanding of "user terminal" and "from the terminal" reinforces FRA-Report and Schmitz teach 1[E]. *See supra* pp.12,50-51; Kaufman, ¶¶476-485,57-77.

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 in the FRA-Report. *See supra* pp.5, 29, 40-43; 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" or verification protocol, where the worker unblocks the track with the code taught in Schmitz, would thus have been

predictable. *See supra* p.43; EX1028, 4, 14-15. Schmitz as discussed above teaches verifying the user with a secret code. 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 code. *Id.*

A POSITA would have combined FRA-Report and Schmitz with a reasonable expectation of success as both involve a verification system, along with access control (Sections VI.A.3, C, F). 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 code. EX1004, Vol. I: Preface; Ground 1, 1[E].

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

Modifying FRA-Report with Schmitz would have had a reasonable expectation of success given the hardware and software in FRA-Report. *See supra* p.44; Kaufman, ¶¶486-492, 57-77.

2. Claims 10, 19, 20, 30

a. 10[Pre], 19[Pre], 20[Pre], 30[Pre]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶¶493,497,501,507.

b. 10[A], 19[A], 20[A], 30[A]

See Ground 1, 1[B]-[C]; EX1004, Vol. II: 10-12, Fig. 1, Table 2; Kaufman, ¶¶494,498,502,508.

c. 10[B], 19[B], 20[B]-[C], 30[B]-[C]

See 1[D]; Ground 1, 1[A], [D], and 10[B], 19[B], 20[B]-[C], 30[B]-[C]; Kaufman, ¶¶495,499,503-504,509-510.

d. 10[C], 19[C], 20[D]-[E], 30[D]-[E]

See 1[E]; Ground 1, 1[D]-[E] and 10[C], 19[C], 20[D]-[E], 30[D]-[E]; Kaufman, ¶¶496,500,505-506,511-512.

3. Claim 40

a. 40[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶514.

b. 40[A]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶515.

c. 40[B]

See Ground 1, 1[B]-[C]; Kaufman, ¶516.

d. 40[C]

See Ground 1, 1[B]-[D]; Kaufman, ¶517.

e. 40[D]

See 1[D]-[E]; Kaufman, ¶518.

f. 40[E]

See 1[C]-1[D]; Kaufman, ¶519.

g. 40[F]

See Ground 1, 1[B]-[C]; Kaufman, ¶520.

h. 40[G]

See 1[D]; Kaufman, ¶521.

4. Dependent Claims

For the reasons discussed in Ground 1, FRA-Report and Schmitz render obvious dependent claims 2-7, 9, 11-16, 18, 21-29, 31-39, 41 (*see supra* pp. 56-62), except here FRA-Report is combined with Schmitz such that the railway traffic control apparatus generates, saves, and transmits a code as taught in Schmitz to the worker, who thereafter, transmits the code to the railway traffic control apparatus which unblocks the track by entry or automatically. *See* 1[D]-[E]; Kaufman, ¶¶522-536.

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

1. Claim 1

a. 1[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶548.

b. 1[A]

See Ground 1, 1[A]; Kaufman, ¶549.

c. 1[B]

See Ground 1, 1[B]; Kaufman, ¶550.

d. 1[C]

See Ground 1, 1[C]; Kaufman, ¶551.

e. 1[D]

FRA-Report and Byford disclose and render obvious 1[D]. Kaufman, ¶552.

i. FRA-Report and Byford Combination

Byford supplies the claimed code such that the dispatcher in FRA-Report operates the track display via the railway traffic control apparatus to block the track and retrieve the worker's electronic contact address, generate and transmit the claimed code (as taught in Byford) to the worker's electronic contact address. *See* Ground 1, 1[Pre]-[D].

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” (*e.g.*, random) code to the relevant person. *Id.*, 5:7-14.

Thus, FRA-Report and Byford disclose and render obvious 1[D]. Given the foregoing, they also disclose 1[D] under the Board’s understanding of the claimed code (see *supra* pp.10-11), including Byford’s “cipher lock code” is a secret code: encrypted code for “one-time access” to the relevant person. Byford even validates the person before providing the code.

FRA-Report and Byford disclose and render obvious 1[D] under Railware’s construction, including the code taught in Byford is secret to the relevant person or “not readily available” to the dispatcher when combined with the FRA-Report. *See supra* pp.10-11.

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 only received by the relevant worker before the Priority Date. *See supra* pp.40-41.

Likewise, a POSITA would have implemented Byford as the claimed code in FRA-Report given there were known problems and motivations in the art, such as

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.41-42; Kaufman, ¶¶553-563,57-77.

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 supra* Sections VI.A.3, E-F.

A POSITA would have modified FRA-Report with Byford because it would have been obvious to try given secret-code systems were known and FRA-Report recognized that a secret-code system would have been implemented. *See supra* pp.5, 29, 40-43; Sections VI.A.3, B-F.

FRA-Report urges a need to implement robust verification measures to effectively verify roadway worker identities, and Byford teaches one such code-based approach. *See supra* pp.43, 77-78.

A POSITA would have been further motivated by the FRA-Report's goals to "improve roadway worker safety" (EX1004, Vol. I: Preface) and implement a "verification system." EX1004, Vol. I: 9, 27. 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. *See supra* p.43.

A POSITA would have appreciated that modifying FRA-Report with Byford would have had a reasonable expectation of success given the hardware and software in FRA-Report. Ground 1, 1[Pre]-1[C]; *supra* p.44. Thus, the FRA-Report would have had flexibility when the code is generated.

The POSITA would further have been motivated to modify FRA-Report to display the code taught in Byford given the worker's user interfaces. Ground 1, 1[Pre]-1[C].

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 or email message. *See supra* p.44; Kaufman, ¶¶564-570,57-77.

f. 1[E]

FRA-Report, Byford, and Macey disclose and render obvious 1[E]. Kaufman, ¶571.

i. *FRA-Report, Byford, and Macey Combination*

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

Thus, based on Macey’s implementation, the worker in FRA-Report would transmit the code as taught in Byford to the railway traffic control apparatus, which centralized control operation will only unblock the track once the transmitted code is entered or automatically. *See* Ground 1, 1[E].

Additionally, a POSITA would have been motivated to combine with a reasonable expectation of success FRA-Report and Byford with Macey’s implementation because there were known problems and motivations in the art, such as protecting workers, a worker controlling a work zone, and one-time code. *See supra* pp.48-49.

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.10, 49-50.

Railware’s understanding of “user terminal” and “from the terminal” reinforces FRA-Report, Byford, and Macey teach 1[E]. *See supra* pp.12,50-51; Kaufman, ¶¶572-578,57-77.

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. *See supra* pp.5, 29, 40-43; Sections VI.A.3, B-F.

FRA-Report’s “verification system” and goal to “minimize[] common human error” 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* p.43; EX1028, 4, 14-15.

FRA-Report recognized “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 the worker with the code. *Id.*; Ground 1, 1[E].

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

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

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.44; Kaufman, ¶¶579-584, 57-77.

2. Claims 10, 19, 20, 30

a. 10[Pre], 19[Pre], 20[Pre], 30[Pre]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶¶585,589,593,599.

b. 10[A], 19[A], 20[A], 30[A]

See Ground 1, 1[B]-[C]; EX1004, Vol. II: 10-12, Fig. 1, Table 2; Kaufman, ¶¶586,590,594,600.

c. 10[B], 19[B], 20[B]-[C], 30[B]-[C]

See 1[D]; Ground 1, 1[A], [D], and 10[B], 19[B], 20[B]-[C], 30[B]-[C]; Kaufman, ¶¶587,591,595-596,601-602.

d. 10[C], 19[C], 20[D]-[E], 30[D]-[E]

See 1[E]; Ground 1, 1[D]-[E] and 10[C], 19[C], 20[D]-[E], 30[D]-[E]; Kaufman, ¶¶588,592,597-598,603-604.

3. Claim 40

a. 40[Pre]

See Ground 1, 1[Pre]; Kaufman, ¶606.

b. 40[A]

See Ground 1, 1[Pre] and 1[B]; Kaufman, ¶607.

c. 40[B]

See Ground 1, 1[B]-[C]; Kaufman, ¶608.

d. 40[C]

See Ground 1, 1[B]-[D]; Kaufman, ¶609.

e. 40[D]

See 1[D]-[E]; Kaufman, ¶610.

f. 40[E]

See 1[C]-1[D]; Kaufman, ¶611.

g. 40[F]

See Ground 1, 1[B]-[C]; Kaufman, ¶612.

h. 40[G]

See 1[D]; Kaufman, ¶613.

4. Dependent Claims

For the reasons in Ground 1, FRA-Report, Byford, and Macey render obvious dependent claims 2-7, 9, 11-16, 18, 21-29, 31-39, 41 (*see supra* pp. 56-62), except here FRA-Report and Byford are combined with Macey's implementation such that the railway traffic control apparatus in FRA-Report generates, saves, and transmits a code as taught in Byford to the worker, who after any work, transmits the code to the railway traffic control apparatus which unblocks the track by entry or automatically. *See* 1[D]-[E]; Kaufman, ¶¶614-628.

VIII. NO BASIS FOR DISCRETIONARY DENIAL

Petition includes new grounds not previously presented. Based on 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 1-7, 9-16, and 18-41 of RE'835.

DATED: November 19, 2025

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CERTIFICATE 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. RE47,835 contains 13,993 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).

DATED: November 19, 2025

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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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