

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NATIONAL RAILROAD PASSENGER CORPORATION D/B/A AMTRAK

Petitioner

v.

RAILWARE, INC.

Patent Owner

U.S. Patent RE47835

Issue Date: February 4, 2020

Title: TOOLS FOR RAILWAY TRAFFIC CONTROL

Inter Partes Review No. IPR2023-01180

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT RE47835
CHALLENGING CLAIMS 1-7, 9-16, 18-41
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 *et seq.***

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PETITIONER’S EXHIBIT LIST

Table of Exhibits for U.S. Pat. RE47835 Petition for *Inter Partes* Review

Exhibit Number	Description
1001	U.S. Pat. RE47835 (“RE’835 Patent”)
1002	File History of U.S. Pat. RE47835
1003	Declaration of Dr. William Michalson including Curriculum Vitae (“Michalson”)
1004	Oriol, N., Sheridan, T. and Multer, J. (2004). <i>Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer: Volume 1: Usability for the Roadway Worker</i> . Report No. DOT/FRA/ORD-04/13.i. U.S. Department of Transportation, Federal Railroad Administration (“Oriol”)
1005	Masquelier, T., Sheridan, T., and Multer, J. (2004). <i>Supporting Railroad Roadway Worker Communications with a Wireless Handheld Computer: Volume 2: Impact on Dispatcher Performance</i> . Report No. DOT/FRA/ORD-04/13.ii. U.S. Department of Transportation, Federal Railroad Administration (“Masquelier”)
1006	WO International Publication No. 2004/042663 to Wise (“Wise”)
1007	U.S. Patent Application Pub. No. 2012/0176217 to Tamaribuchi et al. (“Tamaribuchi”)
1008	<RESERVED>
1009	<RESERVED>
1010	<RESERVED>
1011	<i>Railware, Inc. v. National Railroad Passenger Corporation d/b/a/ Amtrak</i> , 1:22-cv-5013-KPF, Amended Complaint, Dkt. No. 27 (Jun. 30, 2022 S.D.N.Y.) (without exhibits)
1012	<i>Railware, Inc. v. National Railroad Passenger Corporation d/b/a/ Amtrak</i> , 1:22-cv-5013-KPF, Waiver of the Service of Summons, Dkt. No. 17 (Jul. 11, 2022 S.D.N.Y.).

1013	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20050211025837/http://www.fra.dot.gov:80/us/content/412
1014	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20060922194521/http://www.fra.dot.gov:80/us/content/412
1015	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20080212192107/http://www.fra.dot.gov:80/us/content/412
1016	Federal Railroad Administration, Research Reports, available at https://web.archive.org/web/20090320043352/http://www.fra.dot.gov:80/us/content/412
1017	GB2366419 to Nagai et al. (“Nagai”)
1018	WO International Publication No. 2005/047074 to Makkinga (“Makkinga”)
1019	U.S. Patent No. 6,959,233 to Hungate et al. (“Hungate”)
1020	U.S. Patent No. 7,328,090 to Pachl (“Pachl”)
1021	U.S. Patent No. 8,406,943 to Brand et al. (“Brand”)
1022	Internet Archive Affidavit for URLs including EX1013-1016: 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:80/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:80/us/content/412
1023	Excerpt of File History from U.S. Pat. RE49115
1024	File History of U.S. Patent No. 9,403,545
1025	U.S. Patent No. 9,403,545
1026	Malsch, N., Sheridan, T. and Multer, J. (2004). <i>Impact of Data Link Technology on Railroad Dispatcher Operations</i> . Report No. DOT/FRA/ORD-04/11. U.S. Department of Transportation, Federal Railroad Administration (“Malsch”)

TABLE A: LISTING OF CLAIMS

“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] railway <i>traffic</i> control [system] <i>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] 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:
19[A]	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];
19[B]	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
19[C]	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.
Claim 20	
20[Pre]	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:
20[A]	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

	<i>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</i>

	<i>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 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 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>

I. INTRODUCTION

National Railroad Passenger Corporation d/b/a Amtrak (“Petitioner”) petitions under 35 U.S.C. § 312 and 37 C.F.R. § 42 for *inter partes* review of claims 1-7, 9-16, 18-41 (“Challenged Claims”) of U.S. Pat. RE47835 (“RE’835 Patent”) (EX1001). RE’835 Patent is purportedly assigned to Railware, Inc. (“Railware”).¹

The patent relates to generating and communicating a code over a network for railway control. EX1001, Title, Abstract, Fig. 4, 2:59-63, 4:42-46; EX1011, ¶ 15. The RE’835 Patent uses generic components of centralized railway control (computer), network, and mobile device, to transmit known signals for blocking and unblocking railway tracks. EX1001, 1:29-2:10, Figs. 3A, 3B, 5:26–28, 6:17–24, 6:57–7:27; EX1011, ¶¶ 2, 14; EX1023, 2, 8 (¶¶ 5-7), 15-16.

The Grounds advanced here were not relied upon during prosecution of the RE’835 Patent and teach such a centralized railway control system to generate a code and transmit signals to block and unblock tracks.

¹ Petitioner reserves the right to challenge in litigation Railware’s standing to assert the RE’835 Patent and any related patents.

II. MANDATORY NOTICES

A. Real Party-in-Interest – §42.8(b)(1)

Pursuant to 37 C.F.R. § 42.8(b)(1), the Petitioner is the real party-in-interest. Further, the 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.

B. Related Proceedings – §42.8(b)(2)

RE'835 Patent, U.S. Pat. RE49115 ("RE'115 Patent"), and U.S. Patent No. 9,517,782 ("782 Patent") are asserted in *Railware, Inc. v. National Railroad Passenger Corporation d/b/a Amtrak*, 1:22-cv-05013-KPF (S.D.N.Y.) ("Litigation"). Amtrak filed an opposed motion to dismiss on patent ineligibility and other grounds (Dkt. Nos. 27-34), which is fully briefed and pending. No case schedule has been set.

C. 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.

III. CERTIFICATION OF GROUNDS FOR STANDING

RE'835 Patent is available for IPR, and Petitioner is not barred or estopped from requesting this IPR. 37 C.F.R. §42.104(a). The Amended Complaint (EX1011) was served by Patent Owner filing on July 11, 2022 the Waiver of the Service of Summons dated July 8, 2022. EX1012; *The Brinkmann Corporation v. A&J Manufacturing, LLC*, Case No. IPR2015-00056, Paper 10, at 6-7 (PTAB Mar. 23, 2015). Thus, this Petition is filed within one year after Amtrak was served with a complaint for alleged infringement. Amtrak has not filed a separate civil action challenging the validity of the claims of the RE'835 Patent, '782 Patent, and RE'115 Patent. This petition is one of three petitions that Petitioner has filed concurrently.

IV. UNPATENTABILITY GROUNDS

Petitioner requests cancellation of claims 1-7, 9-16, 18-41 based on the grounds below.

Ground	Reference(s)	Challenged Claims	Basis
1	Oriol and Masquelier	1-7, 9-16, 18-41	103
2	Oriol, Masquelier, and Wise	1-7, 9-16, 18-41	103

3	Oriol, Masquelier, and Pachl	1-7, 9-16, 18-41	103
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The three grounds are supported by the Declaration of Dr. William Michalson (EX1003, “Michalson”) and other supporting evidence in the Exhibit List. Michalson, ¶¶19-22.

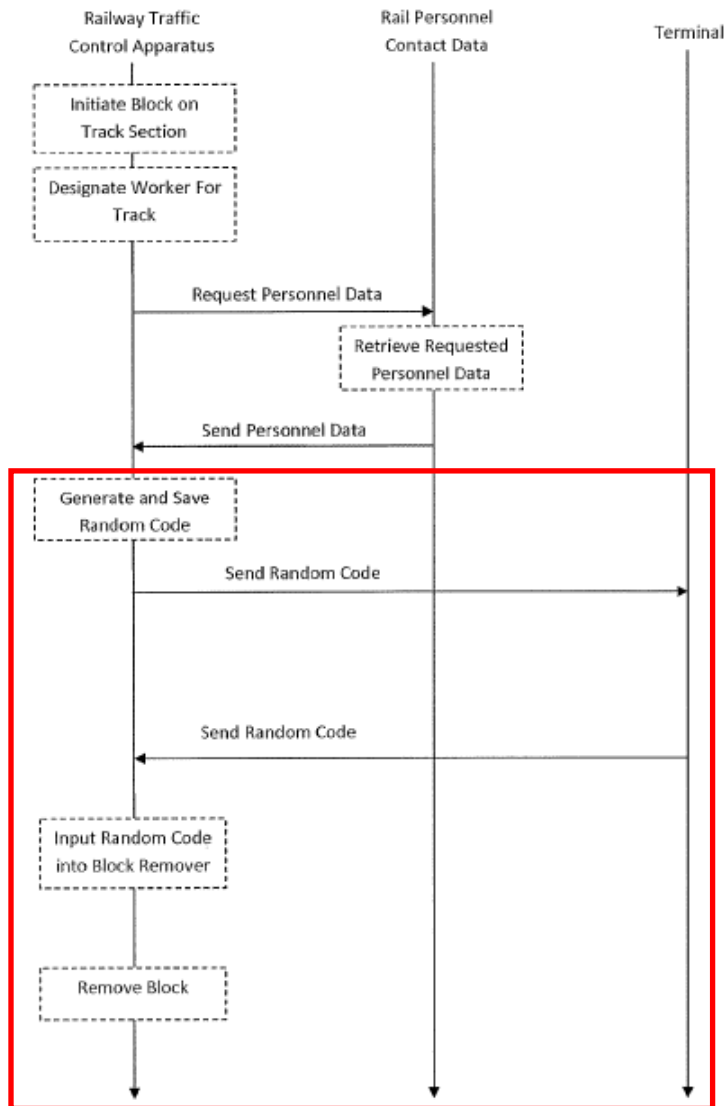
V. RE’835 PATENT

A. Summary

RE’835 Patent (application no. 15/928,955) was filed on March 22, 2018 and issued on February 4, 2020. This is a reissue of U.S. Patent No. 9,403,545 (“’545 Patent”), application no. 14/519,727, filed on October 21, 2014 and issued August 2, 2016, and provisional application no. 61/893,547 filed on October 21, 2013. EX1001, front page.

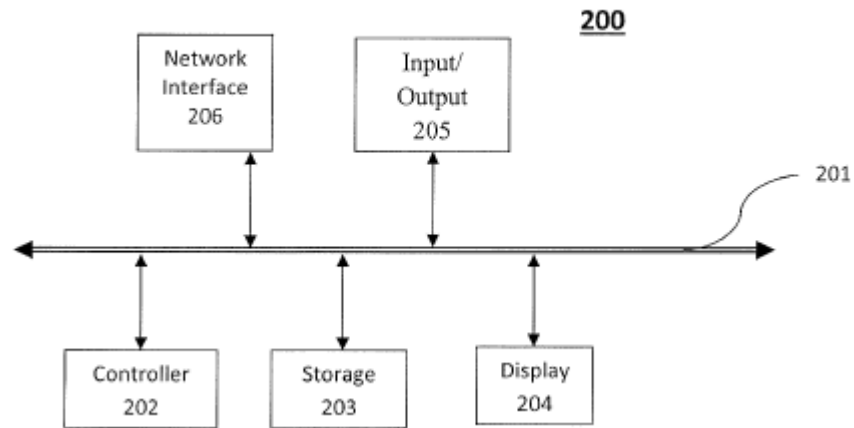
RE’835 Patent describes “Tools . . . to control traffic over a railway track section . . . [where] a block is placed . . . [and] a release code is generated . . . [such that] [t]he block is removed from the track section when the release code is received by the system.” EX1001, Abstract. This is shown in Figure 4 below.

FIGURE 4



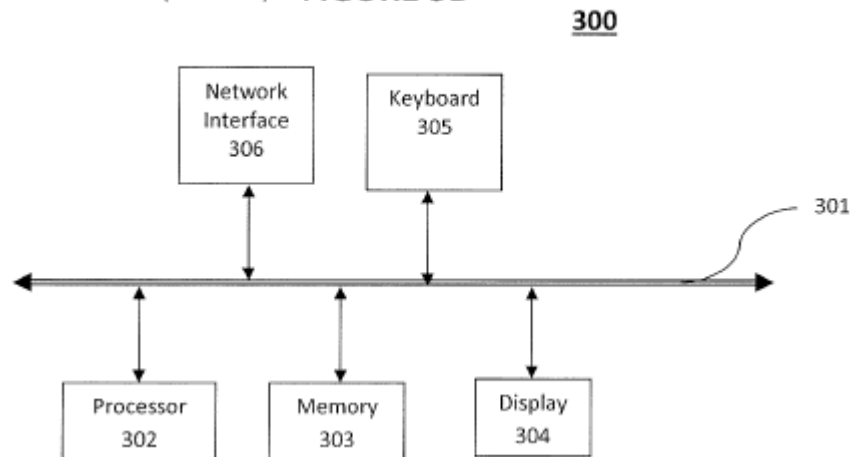
Id., Fig. 4 (annotated). RE'835 Patent admits it invokes generic hardware below in Figures 3A (user terminal) and 3B (railway control apparatus).

FIGURE 3A



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

(Amended) **FIGURE 3B**



Id., Fig. 3B, 6:17-30, 6:57-7:27; Michalson, ¶¶43-46.

B. Prosecution History

The application leading to the '545 Patent did not receive a substantive office action rejection. EX1024.

On March 22, 2018, a reissue application of the '545 Patent was filed. EX1002. After preliminary amendments were filed on March 22, 2018 and May 24, 2018, claims 20-41 were added to existing claims 1-19. *Id.*

On January 23, 2019, a non-final office action rejection was issued based on several grounds, such as certain claims were anticipated by primary reference EP Publication No. 1308366 to Rahn et al. (“Rahn”) (Ground 6); rendered obvious over Rahn with US Publication No. 2011/0006912 to Sheardown et al. (“Sheardown”) and Tamaribuchi (Ground 7); and rendered obvious over Rahn, Sheardown, Tamaribuchi, and Wise (Ground 8). EX1002.

The applicant traversed the rejection on April 23, 2019. *Id.*

On June 12, 2019, the examiner issued a final office action but stated certain claims would be “allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112(b)” *Id.*

On August 9, 2019, Patent Owner amended several claims and cancelled claims 8, 17 in response to a final office action. *Id.*

On September 16, 2019, a notice of allowance was issued. *Id.*

On December 8, 2020 and June 1, 2021, certificate of corrections were issued relating to statements on the related applications. EX1001, last two pages. Michalson, ¶¶49-58.

C. Priority Date

Petitioner assumes for the purpose of this Petition a priority date of October 21, 2013 (the “Priority Date”) but reserves the right to contest this priority date (and priority chain) before the PTAB and district court.

Because RE’835 Patent issued from an application filed after enactment of the America Invents Act (“AIA”) on March 16, 2013, the post-AIA statutory framework applies but evaluating under pre- or post-AIA does not change the below analysis.

VI. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner submits that a person having 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 also would have had at least two (2) years of experience in railway operations or railway control systems and would have programming experience. Michalson, ¶24. A higher level of education or specific skill might make up for less experience, and vice-versa. *Id.* Petitioner’s expert, Michalson, has more than ordinary skill in the art. *Id.*, ¶25.

VII. CLAIM CONSTRUCTION

Petitioner is not aware of any “prior claim construction determination” related to the RE’835 Patent, RE’115 Patent, and ’782 Patent. 37 C.F.R. §42.100(b). Because the prior art discloses the claim limitations, the claims require no express

construction and should be given their plain and ordinary meaning. However, Petitioner reserves the right to raise claim construction arguments in the Litigation.

VIII. OVERVIEW OF THE PRIOR ART

A. State of the Art

RE'835 Patent admits it was known to use an interface in a centralized railway control system to control track blocking and unblocking by transmitting a signal, *e.g.*, blocking signal or unblocking signal, to a track interlock.

Interlocking signals govern movement within a sector controlled by an interlock.

. . .

One method of **controlling all of the interlocks** within a rail system is through a **centralized traffic control (CTC)**, or traffic control system (TCS). A **CTC is used for monitoring, tracking and operating trains traversing tracks throughout a network**. The CTC is controlled by a single person known as a train dispatcher.

. . .

Information regarding track conditions, train traffic, scheduling, etc., **are presented on a control console which may include a map of the entire rail system controlled by the CTC**. Through the **control console, the dispatcher has control of each interlock signal (that is, the dispatcher controls the train traffic and flow of train traffic using the interlocks)** and is constantly made aware of the **positions of trains in the railway system as such positions are electronically reported by signals present throughout the railway system**. In addition, in order to provide for safe traffic control and avoid accidents or collisions, signals are provided throughout the track network, or interlocks.

The interlocks may be controlled from the CTC in any of various different ways

...

EX1001, 1:29-2:10 (emphasis added); EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶38.

It was further conventional for railway workers to operate a mobile device for communicating with a central control system to block and unblock a track. EX1007, Figs. 1-2, 7, [0063], [0068], [0077], [0111], [0119], [0215]; EX1017, Abstract, Figs. 10-11; EX1018, Abstract, 8:5-14, 10:7-10, 11:9-17; Michalson, ¶39. Also, it was known to generate and communicate a code to authorize train movement. EX1019, Abstract, 4:35-42; EX1021, Abstract, Fig. 4; Michalson, ¶40.

The named inventor (Mr. Ross Pirtle) admitted in the application leading to RE'115 Patent that mobile phones, text messaging, and email were known. EX1023, 2, 8 (¶¶ 5-7), 15-16; Michalson, ¶¶41-42.

B. Oriol

Oriol (EX1004) was not considered during prosecution of the RE'835 Patent. Oriol was published by the U.S. Department of Transportation, Federal Railroad Administration in October 2004.

Oriol was available to the relevant public in at least two ways: “This document is available to the public through the [1] National Technical Information Service, Springfield, VA 22161. This document is also available on

the [2] FRA website at www.fra.dot.gov.” EX1004, front page (emphasis added, alteration added), Report Documentation Page (“12a. Distribution/Availability Statement”), notice page (“This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange.”)

Oriol was accessible to a POSITA given the FRA’s statements above that Oriol was “available to the public” (or could be accessed) in multiple ways. Indeed, the Wayback Machine shows Oriol was available at www.fra.dot.gov in, for instance, 2005, 2006, 2008, and 2009. EX1013-1016 (*see* “DOT/FRA/ORD-04/13.i”); EX1022 (Internet Archive affidavit for the websites in EX1013-1016); Michalson, ¶¶61-66. Michalson could access Oriol in EX1013-1016. Michalson, ¶67; EX1022.

Lastly, another reference, Masquelier (EX1005), cites Oriol which further demonstrates that Oriol was available to the public. EX1005, ix, 3, 5, 72; Michalson, ¶67.

Thus, Oriol is prior art under, at least, post-AIA 35 U.S.C. § 102(a) as a POSITA with reasonable diligence could access or locate Oriol in at least two different ways. *GoPro, Inc. v. Contour IP Holding LLC*, 908 F.3d 690, 693 (Fed. Cir. 2018) (qualifies as prior art when “the relevant public has a means of accessing them.”) (citation omitted).

Oriol teaches that a railway worker operates a mobile device (PDA) to request work authorization over the Internet to a central control system, *e.g.*, web server, query server, and database, operated by a dispatcher.

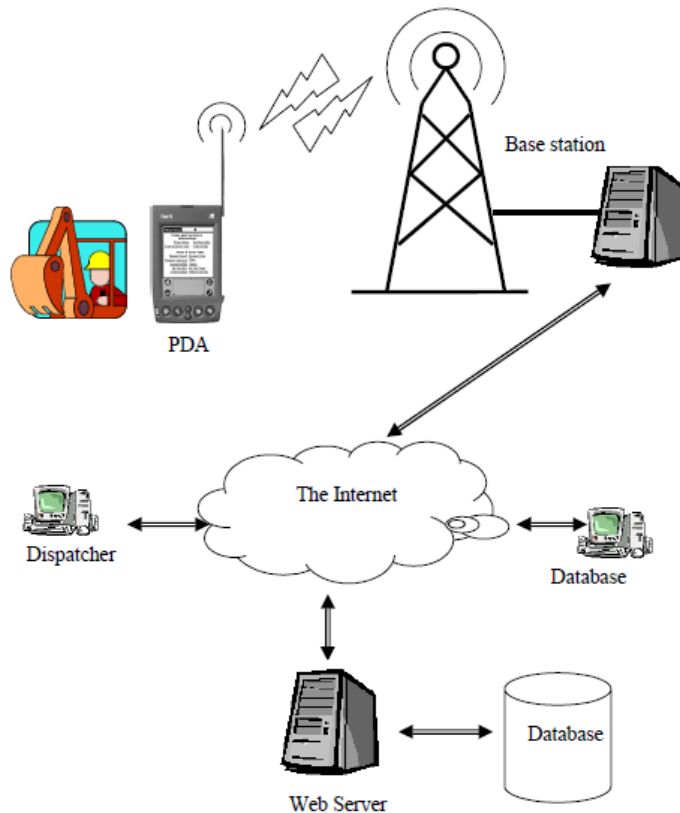


Figure 2. PDA System Architecture

EX1004, Fig. 2, 29. The work authorization can include, *e.g.*, worker's “work involves on-track equipment or will disturb the track” denoted as Form D “Line 4.” *Id.*, 7, 8, Fig. 4.

“If the dispatcher grants the Form D, the appropriate information will be sent to the roadway worker . . . includ[ing] Form D number (automatically assigned by system) . . . foreman in charge of the track out of service.” *Id.*, 38, 6.

After completing the work, the railway worker from the PDA's interface selects "Cancel/Fulfill" link to transmit the same Form D number to the dispatcher's central control system to unblock the track. *Id.*, Fig. A-1 ("You own these form Ds 0003 . . . Cancel/Fulfill . . . NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled"), 36-37; Michalson, ¶¶68-71.

C. Masquelier

Masquelier (EX1005) was not considered during prosecution of the RE'835 Patent. Masquelier was also published by the U.S. Department of Transportation, Federal Railroad Administration in October 2004.

Masquelier is the second volume of Oriol's publication and builds upon Oriol's work. EX1005, title, ix, 3, 5, 72. Like Oriol, Masquelier was available to 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**." *Id.*, front page (emphasis added), Report Documentation Page ("12a. Distribution/Availability Statement"), notice page ("This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange.")

Masquelier was accessible to a POSITA given the FRA's statements above that Masquelier was "available to the public" (or could be accessed) in multiple ways. Indeed, the Wayback Machine shows Masquelier was available at

www.fra.dot.gov in, for instance, 2005, 2006, 2008, and 2009. EX1013-1016 (*see* “DOT/FRA/ORD-04/13.ii”); EX1022 (Internet Archive affidavit for the websites in EX1013-1016); Michalson, ¶¶72-76. Michalson could access Masquelier in EX1013-1016. Michalson, ¶77; EX1022.

Thus, Masquelier is prior art under, at least, post-AIA 35 U.S.C. § 102(a) given a POSITA with reasonable diligence could access or locate Masquelier in at least two different ways.

Masquelier teaches that a railway worker operates a mobile device to request work authorization, *e.g.*, Form D, over the Internet to the dispatcher’s centralized railway system. EX1005, Abstract, 16-18, Figs. 4-5.

Masquelier teaches performing the same tasks as described in Oriol. *Id.*, 15. It further teaches using a central control system visual interface such that after receiving the work authorization request, and if the work is permitted, the dispatcher will select the interface to block the track. *Id.*, 10-12. This dispatcher interface is shown below.

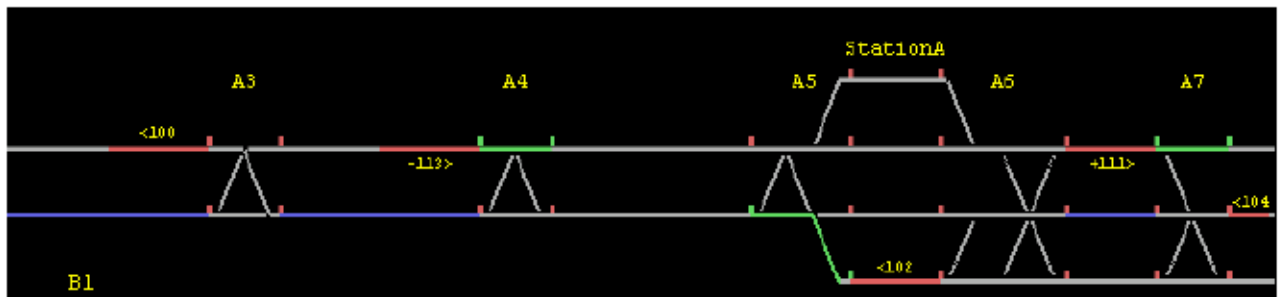


Figure 1. Track Chart Display

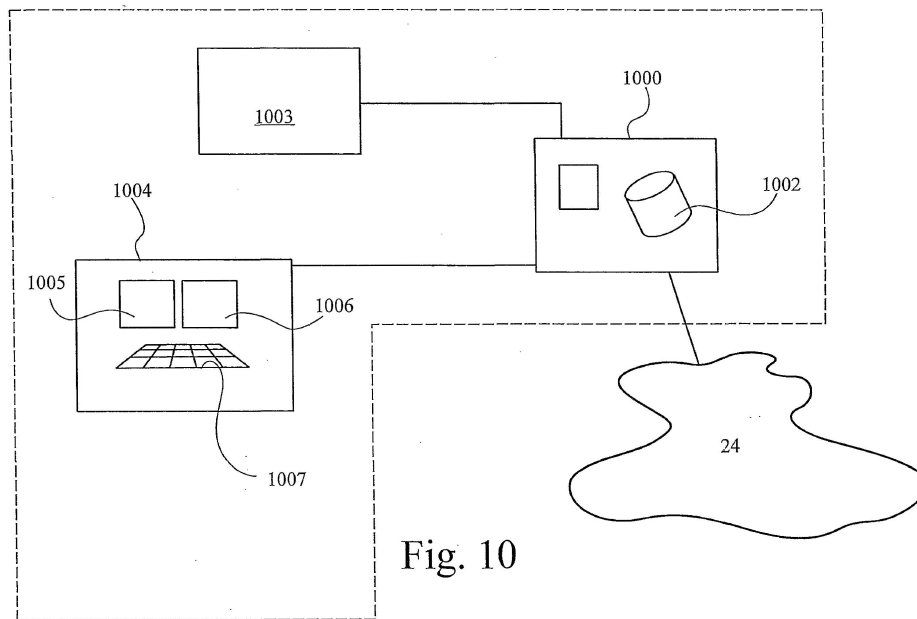
Id., Fig. 1, Table 2 (“Color Code for Monitoring Track Status”). Masquelier further teaches that the dispatcher and railway worker can communicate over text messages (SMS) relating to work authorization. *Id.*, 15, 21, 41.

Once the work is complete, “the roadway worker returns control of the track to the dispatcher, who releases the track for other uses.” *Id.*, 12; Michalson, ¶¶78-81.

D. Wise

Wise (EX1006) was published on May 21, 2004 and is prior art under, at least, post-AIA 35 U.S.C. § 102(a). Wise was cited during the prosecution of the RE’835 Patent and RE’115 Patent. However, the Examiner there did not consider the ground advanced here.

As shown in Figure 10 below, Wise teaches a remote station / call center (central control) with a processor that communicates over a network (Internet) with a worker’s mobile terminal.



Id., Fig. 10, 27:22-28:4, 9:23-28, Fig. 2.

After the worker requests a safety measure (green zone), the central control system blocks the track using signal lights and thereafter generates an access code, *e.g.*, safety check number (“SCN”), which is provided to the worker. *Id.*, Fig. 5H (“S553 Press the traffic-light icon on the toolbar & the SCN is automatically generated”), 7:33-8:2, claims 1, 16, 17, 12:6-15, 24:19-26, 29:32-30:3, 30:20-24.

When the work is complete, the worker transmits the same code or “SCN number . . . previously . . . allocated to the job” to the central control system to release the work. *Id.*, 25:4-9; Michalson, ¶¶82-86.

E. Pchl

Pchl (EX1020) issued as a U.S. Patent on February 5, 2008 and is prior art under, at least, post-AIA 35 U.S.C. § 102(a). It teaches a control center with a

computer interface and storage to first control the track safety measure and then generate a “checking code.” *Id.*, 3:35-45, 1:33-36, 1:11-20, 1:54-58, 1:63-66, 4:9-19, Abstract, Fig. 1.

Pachl also teaches that a train controller at the control center uses the interface to enter a code to release the track. *Id.*, 4:50-59, 2:47-60, Fig. 2. Michalson, ¶¶87-90.

F. Analogous Art

Each prior art reference is analogous art to the claimed invention in the RE’835 Patent. And each is in the same field of endeavor of railway control as in the RE’835 Patent. *Compare* EX1001, title, Abstract, 1:21-25, 2:49-52, 4:8-10, *with* EX1004, Abstract, 6, 13-14, 31-39, Figs. A-1-A-4, 2; EX1005, Abstract, 10-12, 15-18, 21, Figs. 1-2, 4, Table 2; EX1006, Abstract, Fig. 5H, claims 1, 16, 17, 7:33-8:2, 12:6-15, 24:19-26, 25:4-9, 27:22-28:4, Figs. 2, 10; EX1007, Abstract, Figs. 1-2, [0082], [0089], [0167]; EX1020, 1:5-9, 1:33-36, 1:54-66, 3:35-45, 4:9-15, 4:50-59, Abstract, Figs. 1-2, title, claim 1; EX1019, Abstract, 4:35-53, claims 14-15; EX1021, Abstract, Fig. 4, 4:10-17, 4:48-65, 5:24-30, 5:59-6:9, claim 1; EX1018, Abstract, 1:13-2:2, 5:1-11; EX1017, Abstract, 3:9-15, Figs. 10-11; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶¶92.

Additionally, each is reasonably pertinent to any purported problem addressed in the RE'835 Patent. *Id.*; EX1001, title, Abstract, 1:21-25, 2:49-52, 4:8-10; Michalson, ¶93.

IX. SPECIFIC GROUNDS

A. Ground 1: Claims 1-7, 9-16, 18-41 Are Obvious Over Oriol and Masquelier

1. Motivation to Combine; Reasonable Expectation of Success

Masquelier is the second volume to Oriol's publication and cites Oriol several times, such as Masquelier states the "continuing development and evaluation of the [Oriol] application" EX1005, 3, title (similar title as Oriol), ix, 5, 72; Michalson, ¶94. Thus, a POSITA would naturally have been motivated to combine them with a reasonable expectation of success. Michalson, ¶95.

A POSITA would have been motivated to modify Oriol with Masquelier and had a reasonable expectation of success given both Oriol and Masquelier were published by the U.S. Department of Transportation FRA, share two overlapping authors, and discuss solutions using the same types of devices. EX1004, cover page, Report Documentation Page, title, Abstract, 6-8, 29, 38, Figs. A-1-A4, 2, 4; EX1005, cover page, Report Documentation Page, title, Abstract, ix, 3, 5, 72; Michalson, ¶96.

There also would have been a motivation to combine and reasonable expectation of success given both publications are in the field of, and solve the

problem of, railway control for safe maintenance work and both have substantially similar network architecture and describe track blocking and unblocking using signals. EX1004, Abstract, 1, 6, 29, 37-38, Figs. A-1-A4, 2, 4; EX1005, Abstract, ix, 3, 5, 10-12, 16, Figs. 1, 4, Table 2; Michalson, ¶97.

Thus, a POSITA would have been motivated and had a reasonable expectation of success to modify Oriol, including with Masquelier's visual track blocking and unblocking systems and processes. Michalson, ¶98.

For instance, a POSITA would have been motivated to modify Oriol with Masquelier's central control visual interface using signals to control interlocks for track blocking and unblocking to improve safety and efficiency. Michalson, ¶¶99-101.

A POSITA would have had a reasonable expectation of success given Oriol includes central control blocking and unblocking based on the Form D number. EX1004, Abstract, 6, 29, 37-38, 41 (“[t]he system is designed to be highly configurable”), Figs. A-1-A4, 2, 4; Michalson, ¶102.

A POSITA also would have been motivated and had a reasonable expectation of success to use a “centralized traffic control” interface using signals to control interlocks for track blocking and unblocking because RE'835 Patent concedes and another reference teaches it was known to a POSITA. *See* Section VIII.A; EX1001,

1:25-47, 1:51-59; EX1026², ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶103.

2. Claim 1

a. 1[Pre]: “A centralized railway control system comprising:”

Whether or not the preamble is limiting, Oriol teaches 1[Pre] with a centralized railway control system—“Central Traffic Control”—such as “North East Corridor dispatcher” to grant railway track protection to workers. EX1004, 6 (“When a dispatcher receives a request for roadway worker protection . . . [and if] the dispatcher grants permission to work, (under . . . Form D . . .) the track is placed off-limits (blocked) for other uses. In Central Traffic Control (CTC) territory, blocking a track protects the roadway worker since it prevents the dispatcher from routing trains on that track.”), Figs. A-1, A-3 (“**North East Corridor dispatcher** has received your request . . . 2 track out of service”) (emphasis in original), iv, 1, Abstract (“A prototype communications device was developed for roadway workers

² Malsch is prior art because a POSITA could access Malsch in at least two ways similar to Oriol and Masquelier such as www.fra.dot.gov. EX1026, front page, Report Documentation Page; EX1013-1016 (*see* “DOT/FRA/ORD-04/11”); EX1022; Michalson, ¶¶108-109.

. . . to request track protection” from “dispatchers at the Central Traffic Control Center”), Fig. 2 (showing centralized system), 58; Michalson, ¶¶104-105.

Additionally, it was known to a POSITA to have a centrally controllable railway network with plural railways and interlocks as the RE’835 Patent admits and another reference teaches. *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6 (“routing interface displayed the track layout and was modeled after a Central Traffic Control (CTC) based signal system.”), 7-10, 53-56, 59, Figs. 3, 8; Michalson, ¶¶38, 106-112.

b. 1[A]: “a rail personnel contact database registering, for each railway personnel, an electronic contact address of the railway personnel; and”

Oriol teaches 1[A]. Michalson, ¶¶113-118.

Claims 1[A], 10[B], and 19[B] recite a “rail personnel contact database” while independent claims 20, 30, and 40 do not. Michalson, ¶114.

Oriol describes a rail personnel database registering an electronic contact address for each railway personnel given Oriol’s “database includes . . . Roadway workers (MWForemen.txt) . . . [with] information **about registered PDAs and their owner.**” EX1004, 39 (emphasis added), 57 (“Each Palm VII device had a built in device ID . . . [and this] device ID was used to identify which roadway worker was sending each request.”), 38; Michalson, ¶115. To the extent it is argued that the claimed database must be a standalone database, that would have been an obvious

modification because databases and storing data are known and separating data in separate databases is simply a design choice to use more databases. Michalson, ¶116.

The worker's PDA has an electronic contact address given that the Form D number is "sent to the roadway worker who requested it" and the worker's PDA device ID is registered in the railway control apparatus database. EX1004, 38, 39, 57, Figs. A-3 ("Delivered to: Oriol"), A-5; Michalson, ¶117.

Additionally, because the communication is over the Internet, it would have been known to a POSITA that there would be, *e.g.*, an IP address (as well as a MAC address), for the PDA and that some, or all, of that information would be stored in the Oriol database for such Internet communication. Michalson, ¶118.

- c. **1[B]: "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*, 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,"**

Oriol and Masquelier teach 1[B]. Michalson, ¶¶119-132.

Oriol teaches the railway traffic control apparatus which consists of at least the dispatcher's computer, database, and web server (query server) with associated

database that communicates over a network (Internet) with a user terminal (PDA), as shown below.

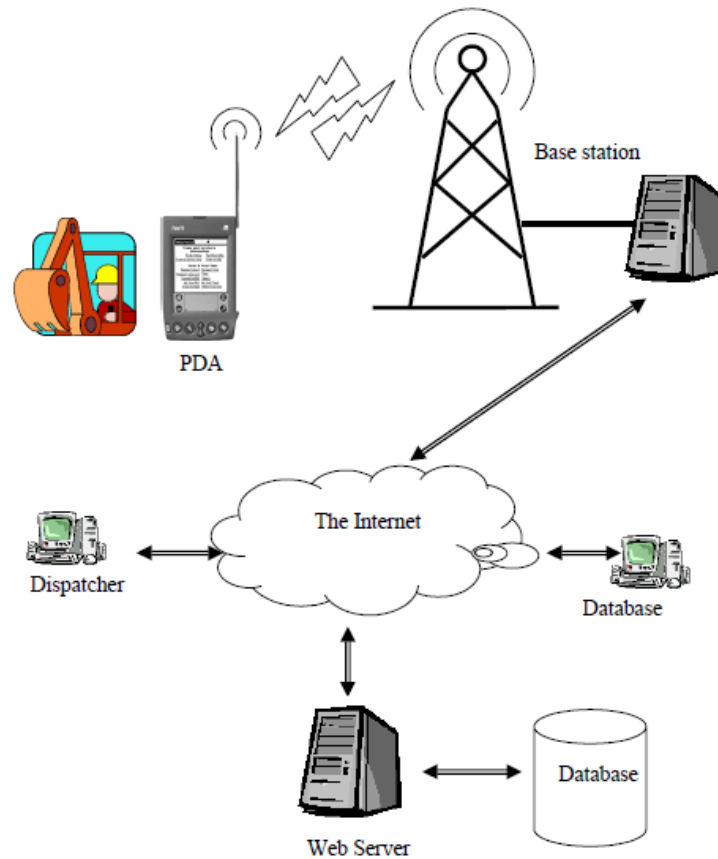


Figure 2. PDA System Architecture

EX1004, Fig. 2, 6, 31; *id.*, Fig. 1; Michalson, ¶¶120-121.

This railway traffic control apparatus provides centralized traffic control over a railway network because it centrally controls over the Internet access to the tracks (the blocking and unblocking of tracks) based on a work authorization (Form D) request from a worker's mobile phone (PDA). *See* 1[Pre]; EX1004, 37 (“worker has finished their job or wants to cancel or fulfill a Form D and is giving the track back to the dispatcher”), 29 (“The PDA also enabled the roadway worker to request a

variety of work authorizations (Form D and Foul Time).”), 11 (“[A] software application was developed for use on a PDA with wireless communication capabilities. . . . The application . . . was intended to facilitate communication between roadway workers and dispatchers.”), Abstract, iii, 6, 13-14, 31-32, Figs. 1, 2, A-1, A-3; Michalson, ¶122.

Masquelier teaches that this railway network includes plural railways and interlocks, including the central dispatcher has a user interface (track display) to transmit a signal to interlock(s), *e.g.*, blocking or unblocking signal, to control access to railway track(s) (blocking and unblocking):

Each dispatcher is in charge of a specific territory where he/she has authority to route the trains, **take tracks out of service, and grant work authorizations. 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.**

. . .

If the dispatcher intended to grant work authorization, the dispatcher proceeded to protect the requested track. At the **Traffic Control Center, the dispatcher could use the track display to protect the**

track segment in question using software that controlled various switched and signals in the field. . . . Operation of these switches is restricted and the protected track will display stop signals at both ends.
...

Once the job is complete, the roadway worker returns control of the track to the dispatcher, who releases the track for other uses.

EX1005, 10-12 (emphasis added), 68 (“**Interlocking**: An interconnection of signals and signals appliances”) (emphasis in original); 67 (“**Block Signal**: A fixed signal displayed to trains at the entrance to a block to govern use of that block.”) (emphasis in original, footnote omitted); EX1004, 1, 6; *see* 1[Pre]; Michalson, ¶123.

Oriol and Masquelier will transmit a block signal to the interlocks to display stop signals which will protect the track for the worker. EX1005, 1, 10, 11-12 (“Operation of these switches is restricted and the protected track will display stop signals at both ends.”), Fig. 1, Table 2, 67; EX1004, 6 (“signals (wayside and in-cab) for the blocked track will display a stop signal at both ends to prevent movement by unauthorized track vehicles.”), 8; Michalson, ¶124.

The central control user interface with plural railways to transmit a signal to interlock(s) for controlling blocking and unblocking of railway track(s) is also shown in Figure 1 and associated Table 2 (“Monitoring Track Status”) below. For instance, the interlocks in Figure 1 for the tracks in blue have been controlled such

that a “portion of track has been protected for use by maintenance” (track blocked) and the interlocks for the tracks in green have been cleared for train movement (track unblocked). EX1005, Table 2; Michalson, ¶125.

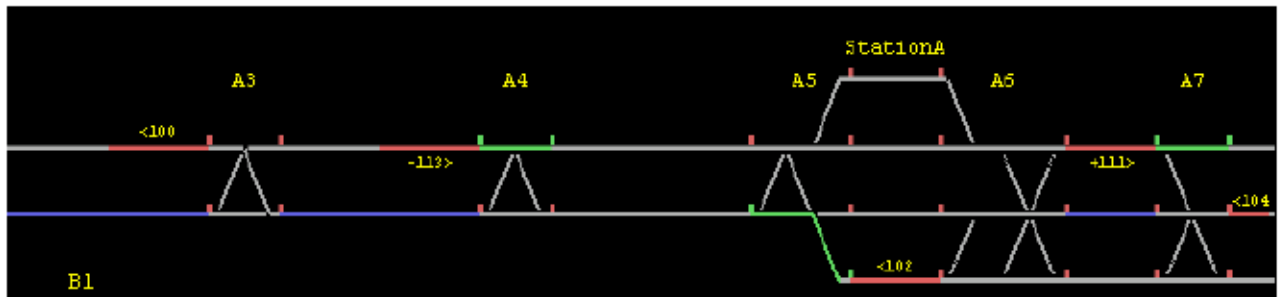


Figure 1. Track Chart Display

EX1005, 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.

Oriol also stores the track information, including the interlocking information. EX1004, 39 (“The database includes information Track information (Track Info.txt). Includes information about all the **locations along the track** (milepost,

dispatcher in charge, maximum train speed, **interlocking** or **station**))” (emphasis added), 15; Michalson, ¶126.

The dispatcher’s computer and web server (query server) with associated database would each have a processor and a non-transitory medium such as a hard drive, memory, or other storage for “storing one or more programs of executable instructions.” Michalson, ¶127. It was also known to a POSITA to have a program in a computer with executable instructions. EX1007, [0067], [0351], [0353]; Michalson, ¶128.

For instance, Oriol describes its components as computers, which would each have a processor and non-transitory medium, and they and the user terminal (PDA) use software. EX1004, 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) [A] Common Gateway Interface (CGI) script . . . [was] used as an interface between the web server and the query servers.”), 38-40, 11, Figs. A-1-A-5; Michalson, ¶129.

Additionally, the RE’835 Patent admits and another reference teaches it was known to a POSITA that each track has a corresponding interlock controlled by centralized control operation, such as transmitting a signal to interlock(s), *e.g.*, blocking or unblocking signal, to control blocking and unblocking of railway track(s). *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59,

Figs. 3 (below with “Active Track Layout” with “Block Track” and “Unblock Track” for interlockings), 8; Michalson, ¶¶38, 130-132; *Lyft, Inc. v. Agis Software Development LLC*, IPR2022-00513, Paper 24, fn 13 (PTAB May 25, 2023).

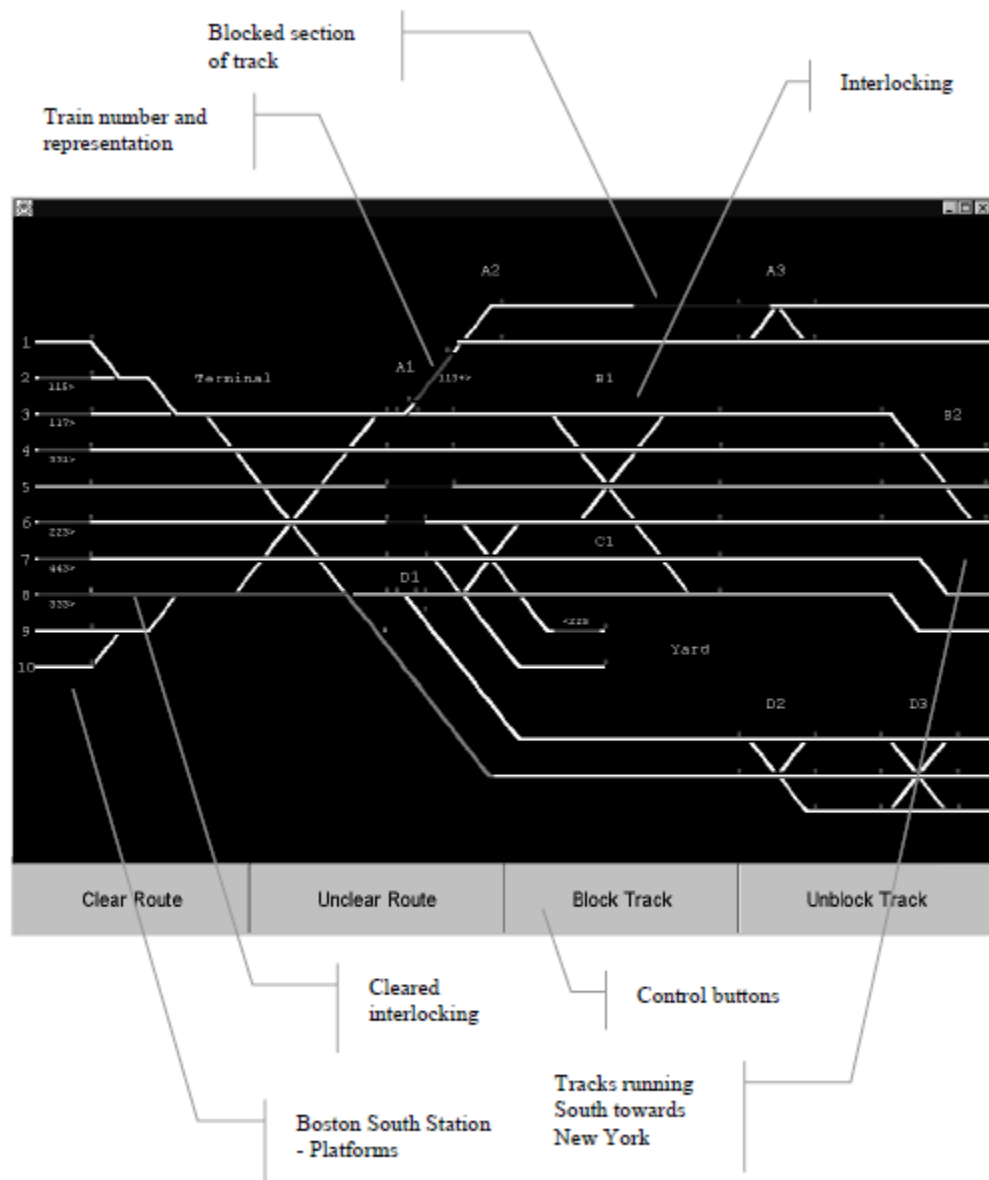


Figure 3. Active Track Layout

EX1026, Fig. 3; *id.*, 9.

- d. 1[C]: “wherein execution of said one or more programs of executable instructions configures *the railway traffic control apparatus comprising* the processor to include:

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];”*

Oriol and Masquelier teach 1[C]. Michalson, ¶¶133-148.

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; claims 20, 30, 40 do not recite such parts). *Id.*, ¶¶134-135

Software would implement the three parts because the claim recites “one or more programs,” which would be understood as software, and the specification describes software (“programming”) to implement the three parts. EX1001, 2:64-3:6, 2:53-55, 6:57-60; EX1023, 2; Michalson, ¶¶136-137. These three parts could be implemented in “one” software program or “more [software] programs” given the recitation in claim 1. Michalson, ¶138.

Oriol teaches the railway traffic control apparatus has a processor and one or more programs of executable instructions to implement the three parts. *See* 1[B]; EX1004, Fig. 2, 14, 31, 36, 38, 39, Fig. A-5; Michalson, ¶139. Additionally, implementing a program in a computer with executable instructions would have been known to a POSITA. EX1007, [0067], [0351], [0353]; Michalson, ¶140.

Oriol teaches that the worker operates a PDA to request work authorization, *e.g.*, Form D Line 4, “on or near the track” from the railway control apparatus. EX1004, 6, 11, 29, 37, Abstract, Preface, Figs. 2, A-1, A-3; *see* 1[B].

Based on this Form D request, the railway control apparatus (or processor) managed by centralized control operation includes a block placing part (software) which blocks the track (also denoted as “out of service” for maintenance).

Query servers used in this study were mainly written in Java (Sun Microsystems, 2001)

....

Dispatcher Query Server. Handles requests sent by the PDA that need dispatcher interaction

....

Answer request for Form D line 4: Used by a dispatcher to grant or deny the requested Form D lines 4. **If the dispatcher grants the Form D, the appropriate information will be sent to the roadway worker**

who requested it . . . [such as] Form D number (automatically assigned by system) . . . foreman in charge of the track out of service.

EX1004, 36-38 (emphasis added), 6 (“When a dispatcher receives a request for roadway worker protection . . . [and if] the dispatcher grants permission to work, (under . . . Form D . . .) the track is placed off-limits (blocked) for other uses.”), 14, Abstract, 13, 31; Michalson, ¶¶141-142.

Oriol and Masquelier describe that the central control system, including the railway traffic control apparatus, blocks and unblocks the track by using the user interface to control signals to the interlocks in the railway network. *See* 1[B]. The track display updates based on, *e.g.*, the railway control apparatus blocking and unblocking the track. EX1005, Table 2 (“Monitoring Track Status”), 10 (“The current study focused on signal territories, where dispatchers receive automatic indication of train location.”), 1, Fig. 1.

This block placing part software managed by centralized control operation is also shown in Figure A-3 where the centralized control railway control apparatus (“North East Corridor dispatcher”) blocks a track based on a work authorization request: **“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 . . . Dispatcher North East Corridor . . .”** EX1004, Fig. A-3 (emphasis added); Michalson, ¶¶143-144.

The track display discussed previously would implement this blocked track, “2 track out of service,” by transmitting signals to the interlocks. EX1005, 10-12, Fig. 1, Table 2; EX1004, 1, 6; *see* 1[B]; Michalson, ¶¶145-146. This exemplary blocking is also shown in the “Request Lines 2, 3” figure. EX1004, Fig. A-3, 31; Michalson, ¶146.

While the track is blocked, the worker can enter the track to perform, *e.g.*, maintenance work, and the “track is placed off-limits (blocked) for other uses.” EX1004, 6, 8 n.1 (Form D, Line 4 requires “the dispatcher to remove it from service”), Figs. A-1, A-3; *infra* 1[E]; Michalson, ¶147.

As discussed in claim 1[B], the RE’835 Patent admits and another reference teaches it was known to a POSITA that each track has a corresponding interlock controlled by centralized control operation, such as transmitting a signal to interlock(s), *e.g.*, blocking or unblocking signal, to control blocking and unblocking of railway track(s). *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶¶38, 148.

- e. **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”**

Oriol teaches 1[D]. Michalson, ¶¶149-163.

Oriol teaches that the worker on the PDA selects the Form D work authorization link, such as “Request Form D Line 4,” and transmits such work authorization to the railway control apparatus. *See* 1[B]-[C]; EX1004, Fig. A-3, 6, 14, 36-38, Figs. A-1, A-3, 2. When the railway control apparatus grants the work authorization, it blocks the track. *Id.*; Michalson, ¶¶149-151.

Claim 1[D] and the specification do not describe the “removal code.” Michalson, ¶152.

Oriol teaches that its railway control apparatus includes a code generation part (software) that generates a “Form D number (automatically assigned by system)” or removal code. EX1004, 38 (Form D line 4: **“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) . . . foreman in charge of the track out of service.”**) (emphasis added), 38 (Form D lines 2 and 3: “Form D number (automatically assigned by system)”); Michalson, ¶153.

Oriol’s Form D number is a removal code given the generated Form D number is sent to the worker “who requested it” (EX1004, 38) and who cancels the same Form D number (or under his authority) to remove the track block. *See infra* 1[E]; EX1004, 36 (“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.”), 37, Fig. A-1; Michalson, ¶154.

Oriol further retrieves the electronic contact address of the worker from the rail personnel database and transmits the removal code to the electronic contact address because Oriol uses the worker’s PDA device ID, which is registered in the railway control apparatus database (*see* 1[A]), to transmit the removal code “to the roadway worker who requested it.” EX1004, 38, 39, 57, Fig. A-3; Michalson, ¶¶155-156.

The railway control apparatus generating the removal code and transmitting the code to the electronic contact address of the worker’s PDA is also shown in Figure A-3, particularly “**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 . . .**” EX1004, Fig. A-3 (emphasis added),³ *id.* (“**Form D Lines**

³ Form D 0001 appears to be a typographical error as it should state Form D 0003 since Form D 0003 is later used in the same figure, the dispatcher’s interface shows Form D 0003 (EX1004, Fig. A-5), and worker cancels Form D 0003 (*id.*, Fig. A-1).

2,3 Request . . . Please confirm Form D 0005 . . . Form D 0005”) (emphasis in original), A-5 (dispatcher interface: **“Form D 0003 is Requested . . . Form D #: 0003 Delivered to: Oriol . . . track out of service”**) (emphasis in original), A-1 (“You own these form Ds 0003, NorthEast Corridor . . . NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled.”); Michalson, ¶157.

To the extent it is argued that claims 1[D], 10[B], 19[B], 20[B], 30[B], and 40[C] require that the code is generated after the track is block, Oriol teaches this as discussed above. EX1004, 38 (block track and then generate and transmit the Form D number with “the track out of service”), Fig. A-3 (request track block, then block the track, and then send the Form D number with the tracked blocked), A-5; Michalson, ¶158.

Nevertheless, a POSITA would have been motivated to modify Oriol and Masquelier to first block the track via the interface and thereafter generate a code as this is merely one of two possible design choices. Michalson, ¶159. Additionally, this modification could enhance safety and security as the central control system would only generate the code once the block has been implemented as otherwise the

Also, the “Form D Lines 2,3” figure shows the same Form D number (Form D 0005) twice, just as the Form D 0003 should appear. *Id.*, Fig. A-3; Michalson, ¶157 n.2.

removal code could be unsafely or incorrectly used before the track is blocked. *Id.*, ¶160.

A POSITA would have a reasonable expectation of success because Oriol and Masquelier could generate a temporary number or other placeholder and then once the track is blocked, generate the Form D number to provide greater security and safety as the Form D number or removal (secret) code would not be known until the track is blocked. Michalson, ¶161. Oriol and Masquelier have the existing hardware and software for the modification and Oriol “is designed to be highly configurable.” EX1004, 41; *see* 1[B]-[C]; Michalson, ¶¶162-163.

- f. **1[E]: “a block removal part to remove only upon entry of the removal code *by said centralized control operation from the railway control apparatus*, the block placed by the block placing part on said one or more track sections.”**

Oriol and Masquelier teach 1[E]. Michalson, ¶¶164-179.

Oriol describes that “[o]nce authorization for track use is granted to a roadway crew and the track is blocked, the dispatcher has delegated authority over that track to the roadway crew.” EX1004, 6; EX1005, 11 (“When the dispatcher gives track authority to a work crew, the dispatcher temporarily loses control over that section of track.”)

The “worker can retrieve a list of Form Ds . . . **under his/her authority . . . [and] [f]ollowing the link[] ‘Cancel/Fulfill’ . . . the roadway worker is able to give**

some track under his authority back to the dispatcher.” EX1004, 36 (emphasis added), 37 39, 31, Fig. A-1; Michalson, ¶¶165-166.

Thus, only the worker can remove the track block “under his/her authority” by selecting the “Cancel/fulfill” link. Michalson, ¶167.

Selecting this link transmits the previously generated Form D number or removal code (*see* 1[D]) to the railway control apparatus block removal part (software), which only unblocks the track after receiving the same removal code.

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

....

Retrieve list of active Form Ds: Used whenever a **roadway worker has finished their job or wants to cancel or fulfill a Form D and is giving the track back to the dispatcher.**

....

Cancel/fulfill Form D: Works together with the previous request. This is the step to **actually cancel or fulfill the Form D.**

EX1004, 37 (emphasis added).

The central control system, including the railway traffic control apparatus, unblocks the track by controlling signals to the interlocks in the railway network.

See 1[B]; EX1005, 10-12 (“Each dispatcher has a workstation to control the switches and signals. . . . Once the job is complete, the roadway worker returns control of the track to the dispatcher, who releases the track for other uses.”); EX1004, 36, 6 (“When the job is completed . . . the dispatcher unblocks the track making it available for other uses.”); Michalson, ¶¶168-169.

This block removal part (software) is also shown in Figure A-1 below where the railway control apparatus removes the track block only based on receiving the same removal code previously generated, particularly “**Cancel/Fulfill Form D . . . You own these form Ds 0003, NorthEast Corridor . . . Cancel/Fulfill . . . Form D Cancel . . . YOU ARE NOT UNDER DISPATCHER PROTECTION NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled.**” EX1004, Fig. A-1 (emphasis added). The user interface would unblock this track by transmitting signals to the interlocks. EX1005, 10-12, Fig. 1, Table 2; Michalson, ¶170.

Thus, a specific form D “0003” is transmitted to the railway control apparatus to unblock the track as shown by the same Form D number, “form D# 0003,” being cancelled. Michalson, ¶171.

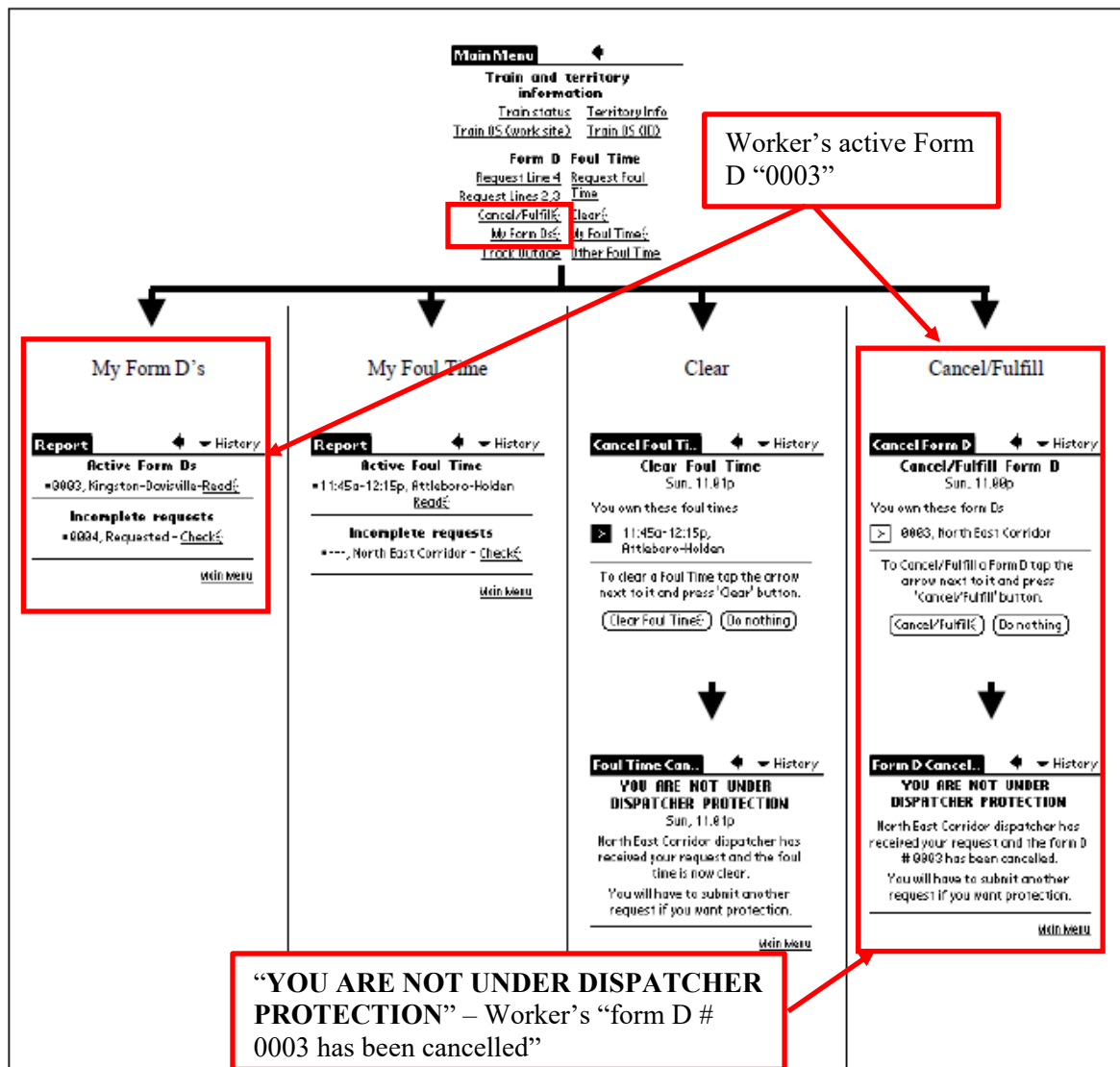


Figure A-1. PDA Screen Shots (1)

EX1004, Fig. A-1 (annotated).

Additionally, the RE'835 Patent admits and another references teaches it was known to a POSITA that each track has a corresponding interlock controlled by centralized control operation, such as transmitting a signal to interlock(s), *e.g.*, unblocking signal, to control the unblocking of railway track(s). *See* Section VIII.A;

EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶¶38, 172.

Claims 1[E], 10[C], and 19[C] also recite removing the block “only upon entry of the removal code.” These claims do not specify how the code is entered other than by “centralized control operation.” Michalson, ¶173.

Oriol teaches the block is removed only upon entry of the removal code because, as discussed above, the code is received, and block removed by the centralized control operation of the railway traffic control apparatus. Indeed, the dispatcher transmits back to the worker that the specific removal code has been cancelled and the worker is no longer under dispatcher protection. EX1004, Figs. A-1; Michalson, ¶¶175-176.

Alternatively, a POSITA would have been motivated to modify Oriol and Masquelier to have the dispatcher enter the removal code or Form D number in the railway traffic control apparatus because it would provide another level of protection before the track is unblocked. Michalson, ¶177. It will also ensure the dispatcher is alert to the information provided. *Id.*

A POSITA would have had a reasonable expectation of success because Oriol teaches a centralized dispatcher user interface and related software that a POSITA could have modified to include entry of the removal code. *See* 1[B]; EX1004, 31, 36, 38, 39, Figs. A-1-A-5, 2; EX1005, 10-12, Figs, 1, 15, Table 2; Michalson, ¶178.

A POSITA would further have been motivated with a reasonable expectation of success to enter the removal code because it was a known to a POSITA to enter a received code for confirming a person was paying attention to allow train movement. EX1021, 4:10-17 (“[T]he unique code is designated for display to the operator H, for the operator H to enter the displayed code into the OCU 42 for purposes of confirming that the operator is paying attention to information”), 4:48-65, Abstract, 5:24-30, 5:59-65, claim 1, Fig. 4; Michalson, ¶179.

3. Claim 10

a. 10[Pre] — Use Centralized Control with Interlocks

See 1[Pre] and 1[B]; Michalson, ¶180.

b. 10[A] — Place Track Block

See 1[B]-[C]; Michalson, ¶181.

c. 10[B] — Generate and Transmit Code

See 1[A] and [D]; Michalson, ¶182.

d. 10[C] — Remove Track Block

See 1[E]; Michalson, ¶183.

4. Claim 19

a. 19[Pre] — Use Centralized Control with Interlocks

See 1[Pre] and 1[B]; Michalson, ¶184.

b. 19[A] — Place Track Block with Interface

See 1[B]-[C]; EX1005, 10-12, Fig. 1, Table 2; Michalson, ¶185.

c. 19[B] — Generate and Transmit Code

See 1[A] and [D]; Michalson, ¶186.

d. 19[C] — Remove Track Block

See 1[E]; Michalson, ¶187.

5. Claim 20

a. 20[Pre] — Use Centralized Control with Interlocks

See 1[Pre] and 1[B]; Michalson, ¶188.

b. 20[A] — Place Track Block

See 1[B]-[C]; Michalson, ¶189.

c. 20[B] — Generate a Secret Code

See 1[D]; Michalson, ¶¶190-198.

Claims 20[B], 30[C], and 40[C] recite a secret release code or secret code instead of a removal code.

The claim language in the above limitations does not describe the “secret code” and what makes a code “secret,” including failing to detail any specific level of security. *See also* EX1001, 6:3-6 (no specifics); Michalson, ¶¶191-192.

Oriol and Masquelier teach these claim limitations in that the generated Form D number is a secret code given only a specific registered worker can access the

Form D numbers he owns. EX1004, 57 (“Each Palm VII device had a built in device ID that could be sent with every message. This **device ID was used to identify which roadway worker was sending each request.**”) (emphasis added), 36 (“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.”), 39, 37, 38; *see* 1[D]; Michalson, ¶193.

Moreover, the central control system-worker communications were secured and protected, including by “cryptographic technology.” *Id.*, 57-58 (“The Palm VII incorporated several levels of protection Palm VII used a cryptographic technology . . [and there] were also other levels of security such as network authentication”).

Thus, the Form D number is a secret code given the worker can only access the Form D number “under his/her authority” and given this code is transferred using the secured communications described above. Michalson, ¶¶194-195. To extent the secret code must have even further security, this was known to a POSITA. EX1021, 4:8-9 (“Software within the LCU 40 could be used to generate a random number as the basis for the unique code.”); EX1019, 4:39-53 (“secure code generator 11 at the dispatch office generates the secure code” and can use a “multiple digit number generation algorithm”), 5:40-52 (encrypted code); Michalson, ¶196.

The secret code is further associated with the blocked track because the secret code is stored in the database and “sent to the roadway worker” with the track out of service. *See* 1[D]; EX1004, 31, 37-39, Figs. A-1, A-3; Michalson, ¶197.

The railway control apparatus generating the secret code and associating it with the block track section is also shown in Figure A-3, particularly “**Form D Line 4 Request . . . North East Corridor dispatcher** has received your request . . . **Please confirm Form D 0001 . . . 2 track out of service . . .**” EX1004, Figs. A-3 (emphasis in original), A-1, A-5; *see* 1[D]; Michalson, ¶198.

d. 20[C] — Transmit the Secret Code

See 1[D]; Michalson, ¶199.

e. 20[D] — Receive the Secret Code

See 1[D]-[E]; Michalson, ¶200.

f. 20[E] — Remove Track Block

See 1[E]; Michalson, ¶¶201-202. Claims 20[E] and 30[E] do not recite “entry” of the removal code while claim 40 does not require the code to be transmitted back to the railway control apparatus for entry to unblock the track. Michalson, ¶202.

6. Claim 30

a. 30[Pre] — Use Centralized Control with Interlocks

See 1[Pre] and 1[B]; Michalson, ¶203.

b. 30[A] — Place Track Block

See 1[B]-[C]; Michalson, ¶204.

c. 30[B] — Generate Secret Code

See 1[D], 20[B]; Michalson, ¶205.

d. 30[C] — Transmit Secret Code

See 1[D], 20[B]; Michalson, ¶206.

e. 30[D] — Receive the Secret Code

See 1[D]-[E], 20[B]; Michalson, ¶207.

f. 30[E] — Remove Track Block

See 1[E], 20[B]; Michalson, ¶208.

7. Claim 40

a. 40[Pre] — System

See 1[Pre]; Michalson, ¶209.

b. 40[A] — Use Centralized Control with Interlocks

See 1[Pre] and 1[B]; Michalson, ¶210.

c. 40[B] — Place Track Block

Oriol and Masquelier teach receiving a track selection to block which is managed by centralized control, where each track section corresponds to one or more railway traffic interlocks among a plurality of interlocks in the railways constituting the railway network. *See* 1[B]-[C]; EX1005, 10-12, Fig. 1, Table 2; EX1004, 39.

This was also known to a POSITA. *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶211.

Figure 1 below shows a track display where a track is selected to block it by controlling one or more railway traffic interlocks among a plurality of railway traffic interlocks in the railway. EX1005, 11 (“At the Traffic Control Center, the dispatcher could use the track display to protect the track segment in question using software that controlled various switched and signals in the field.”), 10, 12.

For instance, the tracks in blue have been selected such that the corresponding interlocks resulted in a “portion of track has been protected for use by maintenance” (track blocked) and tracks in green have been selected such that the corresponding interlocks resulted in the track being “cleared (authorized for use) for train movement” (track unblocked). EX1005, Table 2 (“Color Code for Monitoring Track Status”); Michalson, ¶¶212-213.

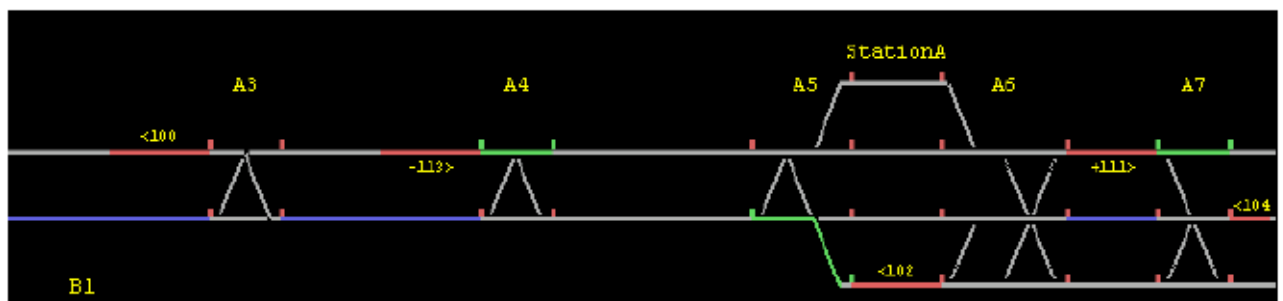


Figure 1. Track Chart Display

Id., Fig. 1, Table 2.

d. 40[C] — Generate Secret Code

Oriol and Masquelier teach responsive to selecting the track, generating the code associated with the track. *See* 1[B]-[D], 20[B]; Michalson, ¶214.

e. 40[D] — Save Secret Code

Oriol and Masquelier teach responsive to generating the Form D number or secret code, the code is saved. EX1004, 31 (“**Database**. . . . This database stores information about . . . train information (direction of travel, number of cars, engine number), **out of service track under Form D . . .**”) (emphasis added), 39 (“Form Ds . . . are . . . stored in the machine running the web server.”), 37; *see* 1[D], 20[B]; Michalson, ¶215.

f. 40[E] — Associate Secret Code with User

See 1[D]-[E], 20[B]; EX1004, 38, 39, 57, Fig. A-3; Michalson, ¶216.

g. 40[F] — Transmit Block Signal

Oriol and Masquelier teach that the dispatcher blocks the track by selecting the track on the display and transmitting a block signal to the interlocks to display stop signals which will protect the track for the worker. *See* 1[B]-[C]; EX1005, 1 (signals to block track), 10, 11-12 (“Operation of these switches is restricted and the protected track will display stop signals at both ends.”), Fig. 1, Table 2, 67; EX1004, 6 (“signals (wayside and in-cab) for the blocked track will display a stop signal at

both ends to prevent movement by unauthorized track vehicles.”), 8; *see* 40[B]; Michalson, ¶217.

This was also known to a POSITA. *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶218.

h. 40[G] — Transmit Secret Code

See 1[D]-[E], 20[B]; Michalson, ¶219.

8. Dependent Claims

a. Claims 2/11 — Place Track Block and Identify Worker

Oriol and Masquelier teach claims 2/11, including the central dispatcher has a user interface to control the signals to interlocks (*e.g.*, blocking signal) to block a specific track and specify the worker performing the work on the track. *See* 1[B]-[C], 40[F]; EX1004, Figs. A-1, A-3 (“**North East Corridor dispatcher** has received your request . . . Delivered to: Oriol . . . 2 track out of service . . .”) (emphasis in original), A-5 (“in charge of Oriol [fillable text box]”); EX1005, 10-12, 15, 21, 27, Fig. 1, Table 2; Michalson, ¶220.

A POSITA would have been motivated with a reasonable expectation of success to modify the dispatcher’s user interface to specify identifying information of the worker given it would increase efficiency if the current worker is unable to start or complete the work. *See* 1[B]; EX1005, 10-12, Figs. 1, 15, Table 2; Michalson, ¶221. Masquelier teaches “[s]ending a message by clicking on a roadway

worker on the tracking display,” so the change would be minimal. EX1005, 21, 15, 27, 41, 63; Michalson, ¶222.

b. Claims 3/12 — Store Block Information

Oriol and Masquelier teach claims 3/12 because the railway traffic control apparatus (database or other components) stores block identifying information, both the “track[s] out of service” and “Form D” or removal code. EX1004, 14, 31 (database stores “out of service track under Form D”), 39 (“Form Ds . . . are . . . stored in the machine running the web server”), 39 (“The database includes information . . . [including] Track information (Track Info.txt). Includes information about all the locations along the track”) (emphasis in original), 36-38, Figs. A-1, A-3; *see* 40[D]; Michalson, ¶223.

It would have been obvious to a POSITA to store the claimed information in a database to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶224; EX1004, 39-40.

c. Claims 4/13 — Store Further Block Information

Oriol and Masquelier teach claims 4/13 because the railway traffic control apparatus (database or other components) stores the dispatcher who requested the block (“dispatcher in charge”) and blocked track sections (“track out of service under Form D.”) EX1004, 14, 31, 36-39, Figs. A-1, A-3, A-5; *see* 3/12; Michalson, ¶225.

The railway traffic control apparatus further stores reasons for the track block (“work site description”) and date and time block placed. EX1004, 37 (“**Dispatcher Query Server. . . . Requests sent by PDA: Request Form D line 4: Used to send a work site description to the dispatcher, track number, and desired window of time to perform a work**”) (emphasis added), 38, Figs A-1, A-3 (showing reasons for work, date and time, and dispatcher); Michalson, ¶226.

It would have been obvious to a POSITA to store the claimed information in a database to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶227; EX1004, 39-40.

d. Claims 5/14 — Block and Unblock Track with Code

Oriol and Masquelier teach claims 5/14. They describe a blocking placing part to block a track, generate the removal code, and transmit the removal code to the electronic contact address of the worker. *See* 1[Pre]-[D]. The block remains in place until the entry of the removal code which causes the block removal part to remove the block. *See* 1[E]; Michalson, ¶¶228-230.

e. Claims 6/15 — Block Removal Interface

Oriol and Masquelier teach claims 6/15 because the removal code is entered in an interface to cause the block removal part to remove the block on the track. *See* 1[B], [E]; Michalson, ¶231.

f. Claims 7/16 — Confirm Track Cleared

Oriol and Masquelier teach claims 7/16. Michalson, ¶¶232-239.

A POSITA would have been motivated to modify Oriol and Masquelier's dispatcher interface to display, in addition to the entry of the removal code, confirmation that the track sections have been cleared from the worker. Michalson, ¶233.

This would provide another level of protection to ensure all workers have left the track before unblocking the track. EX1026, 12; Michalson, ¶234. There would be a reasonable expectation of success given the existing interfaces and software and database. *See* 1[B], 1[E]; EX1005, 10-12, Fig. 1, Table 2; Michalson, ¶235.

Oriol and Masquelier teach a database for registering the blocked tracks ("track out of service under Form D."), date and time block was placed, and worker associated with block ("Oriol"). EX1004, 14 ("The database contained . . . track out of service under Form D"), 31, 39, Figs. A-3 (showing tracks blocked, date and time, and worker: "Delivered to: Oriol"), A-5, 38, 31, 36-39; *see* 2/11, 3/12, 4/13; Michalson, ¶236.

Oriol and Masquelier also store the date and time the block was removed. EX1004, Fig. A-1 ("Sun, 11:00 p . . . NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled."), 37; Michalson, ¶237.

A POSITA would be motivated to store the user who entered the removal code and specified the confirmation that the track sections have been cleared (and other information to the extent it is argued as absent) because this information would provide a transaction log history which would enable others in the future to determine if the correct procedures were followed, analyze any error, and train others using the system. Michalson, ¶238.

There would be a reasonable expectation of success as Oriol and Masquelier store significant information, so this data could be efficiently maintained. EX1004, 13-14, 31, 36-37, 39-40, Figs. 1-2; *see* 2/11, 3/12, 4/13; Michalson, ¶239.

g. Claims 9/18; 27/37; 28/38; 29/39 — Transmit Message

Oriol and Masquelier teach claims 9/18, 27/37, 28/38, and 29/39. Michalson, ¶¶240-250.

Oriol and Masquelier's railway control apparatus generates the Form D number or secret code (*see* 1[Pre], [B]-[D], 20[B]) and transmits that code to the worker's PDA or electronic contact address. *See* 1[A], [D]-[E]. The worker's PDA interface displays a message, *e.g.*, embedded link of "Cancel/Fulfill" in Fig. A-1, which when activated returns the code to the railway control apparatus. *See* 1[E]; EX1004, Figs. A-1, A-3.

A POSITA would have been motivated to modify Oriol and Masquelier with a reasonable expectation of success to transmit the, *e.g.*, embedded link of

“Cancel/Fulfill” in Fig. A-1, in text message or email. Mr. Pirtle admits that mobile phones, text messaging, and email were conventional. *See* Section VIII.A; EX1023, 2, 8 (¶¶ 5, 7), 15-16; Michalson, ¶¶241-244.

There would also have been a motivation to combine with a reasonable expectation of success to transmit the code in a text message or email to the worker to provide a more accessible form. Masquelier specifically updated Oriol’s PDA with the “Qualcomm® pdQ™ Smartphone 800” for text messaging relating to work authorization. EX1005, 15, 21, 27, 41, 63.

Also, workers “were asked if they would use the PDA in their jobs. Interest was high for both requesting information and work authorizations” and workers were familiar with email and cell phones. EX1004, 25, 16, 13. Thus, there would be a motivation to modify Oriol with a reasonable expectation of success to further improve Oriol. *Id.*, 26.

The worker responds to the text message or email by selecting the cancel/fulfill link to transmit the previously generated removal code to the railway control apparatus to remove the track block for other uses. *See* 1[E]; EX1005, 41, 63; Michalson, ¶¶245-250.

h. Claims 21/31 — Place Block via Interlocking Signal

Oriol and Masquelier teach claims 21/31 as they place a block using an interlocking signal, which causes the display of stop signals and prohibits trains from

traversing a track. *See* 1[B]-[C], 19[A], 22/32; EX1005, 10-12, Fig. 1, Table 2; EX1004, 6, 8; Michalson, ¶251.

This was also known to a POSITA. *See* Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶252.

i. Claims 22/32 — Display Stop Signal

Oriol and Masquelier teach claims 22/32, where the railway traffic control apparatus places a block by causing the interlocks to display a stop signal. *See* 1[B]-[C], 19[A], 40[F]; EX1005, 11-12 (“Operation of these switches is restricted and the protected track will display stop signals at both ends.”); EX1004, 6, 8.

Also, it would be an obvious modification to a POSITA to cause the interlocks to display a stop signal. EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶¶253-254.

j. Claims 23/33 — Only Receive Secret Release Code

Oriol and Masquelier teach claims 23/33 in that only the railway traffic control apparatus and the worker’s PDA receive the generated secret release code. *See* 20[B]-[C], 1[D]-[E]; Michalson, ¶255.

k. Claims 24/34 — Store Secret Code

Oriol and Masquelier teach claims 24/34 as the railway traffic control apparatus stores the secret release code in memory or database. *See* 40[D], 20[B]-[C], 3/12; Michalson, ¶256.

l. Claims 25/35 —Store Block Removal Information

Oriol and Masquelier teach claims 25/35 because they generate and store block removal information in response to removing the blocked track. *See* 1[E]; EX1004, Fig. A-1 (“Sun, 11:00 p . . . NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled.”), 39, 14, 37; *see* 7/16; Michalson, ¶257.

It would have been obvious to a POSITA to store the claimed information in a database to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶258; EX1004, 39-40.

m. Claims 26/36 — Store Block Removed Date & Time

Oriol and Masquelier teach claims 26/36. *See* 7/16. As discussed in claims 7/16, it would have been obvious to a POSITA to store the date and time the block was removed as well as the dispatcher who entered the code. *See* 7/16; Michalson, ¶¶259-260; EX1004, 39-40.

n. Claim 41 — Release Track Block Based on Verifying Secret Code

Oriol and Masquelier teach claim 41. Oriol and Masquelier store and transmit the code to the worker, where the worker transmits the code to the railway control apparatus to remove the track block. *See* 1[D]-[E], 3/12, 20[B]-[C], 40[D].

Oriol teaches that the railway control apparatus removes the track block only after determining the same (or second) secret code matches the stored code, particularly **“Cancel/Fulfill Form D . . . You own these form Ds 0003, NorthEast Corridor . . . Cancel/Fulfill . . . Form D Cancel . . . YOU ARE NOT UNDER DISPATCHER PROTECTION NorthEast Corridor dispatcher has received your request and the form D # 0003 has been cancelled.”** EX1004, Fig. A-1 (emphasis added); *see also id.*, 37, 39; *see* 1[D]-[E]; Michalson, ¶¶261-263.

Also, it was known to a POSITA to transmit a block removal signal to unblock the track. *See* 1[E]; Section VIII.A; EX1001, 1:29-2:10; EX1026, ix, 1, 6-10, 53-56, 59, Figs. 3, 8; Michalson, ¶264.

Additionally, Oriol and Masquelier would not release the track block based on an incorrect, or arbitrary, returned code as that would jeopardize the worker’s safety. *See* 1[E], 3/12; Michalson, ¶265.

It would have been obvious to a POSITA to verify a stored code with the returned code and only release the track block if the codes match (or maintain the block if they do not match). A POSITA would have a reasonable expectation of success given it is a straightforward comparison of secret codes. Michalson, ¶¶266-267.

It was also known to a POSITA to compare codes to provide railway authority. EX1019, 4:35-42, claims 14-15, Abstract; Michalson, ¶268.

B. Ground 2: Claims 1-7, 9-16, 18-41 Are Obvious Over Oriol, Masquelier, and Wise

1. Motivation to Combine; Reasonable Expectation of Success

A POSITA would have been motivated to combine Oriol, Masquelier, and Wise and had a reasonable expectation of success given the references are in the field of, and solve the problem of, railway control for safe maintenance work. EX1004, Abstract, 29, 37, Fig. 2; EX1005, Abstract, 3, 10-12, 16, Fig. 4; EX1006, title, Abstract, 1:3-7, 12:6-15; Michalson, ¶269.

There also would have been a motivation to combine and reasonable expectation of success given the references use central railway traffic control. EX1004, Abstract, 1, 6, 29, 37-38, Figs. A-1-A4, 2, 4; EX1005, Abstract, ix, 3, 5, 10-12, 16, Figs. 1, 4, Table 2; EX1006, Abstract, 7:33-8:2, 9:23-28, 12:6-15, 24:19-26, 27:22-28:4, claims 1, 16, 17, Figs. 2, 5H, 10; Michalson, ¶270.

For instance, a POSITA would have been motivated to modify Oriol and Masquelier with Wise's first blocking the track and thereafter generating a unique access code (*e.g.*, SCN), as the removal or secret code. Michalson, ¶271; *see* Section VIII.D. This modification could enhance safety and security as the central control system would only generate the code once the block has been implemented as otherwise the dispatcher and/or third-party could unsafely or incorrectly use the code before the track is blocked. Michalson, ¶272. Moreover, because Wise's code would

be separate from the Form D number, it would be more difficult for a third-party to decipher and potentially unsafely unblock the track. Michalson, ¶273. Thus, Wise's code could provide another layer of security over the Form D number because it acts as authority to enter the track for maintenance. Michalson, ¶274; EX1006, Abstract, 12:6-15, claims 1, 15-17, 23, 24:19-26, 26:14-23, Fig. 5H.

A POSITA would have a reasonable expectation of success because Oriol and Masquelier have existing hardware and software (for the Form D number) such that they could visually block the track and then generate and transmit Wise's code. *See* Ground 1, 1[B]-[D]; Michalson, ¶275. Indeed, Oriol notes that "[t]he system is designed to be highly configurable," which would further enable a POSITA to make modifications. EX1004, 41. Also, because Oriol generates and transmits a Form D number and other information to the worker's device, it would require minimal changes to likewise generate and transmit Wise's access code. EX1004, 38, Fig. A-3; Michalson, ¶¶276-277.

Further, a POSITA would have had a reasonable expectation of success for the worker to transmit the same removal code to the railway control apparatus to unblock the track. For instance, a POSITA would modify Oriol's "Cancel/Fulfill" in Fig. A-1 (*see* Ground 1, 1[E]) such that the Wise code would be returned with the Form D number to the railway control apparatus. Michalson, ¶278. This would

require minimal effort or programming given the existing hardware and software. *See* Ground 1, 1[B]-[C]; Michalson, ¶279.

2. Independent Claims

Oriol, Masquelier, and Wise render obvious independent claims 1, 10, 19, 20, 30, and 40. Michalson, ¶¶280-285.

After blocking the track, Oriol and Masquelier would also generate and transmit Wise’s code such as an SCN to the worker. Michalson, ¶281.

Wise teaches that, after the worker requests a safety measure (denoted as a green zone), the central control system blocks the track using signal lights and thereafter generates an access code, *e.g.*, SCN, which is provided to the worker. *See* Section VIII.D; EX1006, Fig. 5H (“S553 Press the traffic-light icon on the toolbar & the SCN is automatically generated . . . Pass number to COSS [controller of site safety]”), 7:33-8:2 (“[G]reen zone refers to a location where there is a blockage such a[s] traffic lights”), claims 1, 16 (“unique access code is provided to said user”), 17, 30:20-24 (“operators . . . may take steps . . . by controlling traffic lights in the region, controlling the speed of trains or preventing trains from running.”), 29:32-30:3 (“operators will be responsible for controlling signalling”), 12:6-15, 24:19-26, Abstract; Michalson, ¶282.

Wise teaches that the access code transmitted to the worker provides authority to enter a track for maintenance. EX1006, 12:6-15 (SCN “authorises/permits the user

. . . to carry out work and access a work site. Alternatively the user themselves may not enter the work site.”), claims 1, 15-17, 23, 24:19-26, 26:14-23, 16:16-19, Abstract, Fig. 5H. This code would be considered a secret code because without the code a worker cannot access the worksite and only that worker has access to the code. *Id.*; *id.*, 31:33-32:3; Michalson, ¶¶283-284.

When the work is completed and once “Cancel/Fulfill” is selected, Oriol and Masquelier would transmit Wise’s access code (and Form D number) to the railway control apparatus to be entered. *See* Ground 1, 1[E]; EX1006, 25:4-9 (transmits the same removal code or “SCN number . . . previously . . . allocated to the job” to the central control system); Michalson, ¶285.

3. Dependent Claims

a. Claims 2/11 — Place Track Block and Identify Worker

Oriol, Masquelier, and Wise teach claims 2/11 as Wise describes an “assignment screen” in which the central control operator can assign a worker for a blocked track. Ground 1, 2/11; EX1006, 23:20-35, Figs. 5H (“S553 Press the traffic-light icon on the toolbar & the SCN is automatically generated”), 6D (worker fields: “Sentinel ID,” “FirstName,” and “LastName” and block placed: “Actually Initiated” in date/time), 31:2-6; Michalson, ¶286.

b. Claims 3/12 — Store Block Information

Oriol, Masquelier, and Wise teach claims 3/12 as Wise stores the tracks blocked and the removal code. Ground 1, 3/12; EX1006, 20:4-21, 31:2-6, 28:6-12, Figs. 2, 5H, 6B-D, 8A-B, 10, claim 16; *see* 4/13, 41; Michalson, ¶287.

It would have been obvious to a POSITA to store the claimed information in a database to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶288.

c. Claims 4/13 — Store Further Block Information

Oriol, Masquelier, Wise teach claims 4/13. Michalson, ¶¶289-292.

Wise displays the blocked track sections, reasons for the block, and date/time block was placed. *See* Ground 1, 4/13; claims 3/12; EX1006, Figs. 2, 6A (“Nature of your work”), B-D (block placed: “Actually Initiated” in date/time), 8A-B (showing tracks), 10, 19:20-25, 20:4-21, 28:6-12, 31:2-6; Michalson, ¶290.

Such information would be stored in a database or other storage. EX1006, 31:2-6, 28:6-12, 20:15-18, Figs. 2, 10; Michalson, ¶291.

It would have been obvious to a POSITA to store the claimed information, including the user who specified the instruction to block the track sections, in a database to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶292.

d. Claims 5/14 — Block and Unblock Track with Code

See Ground 1, 5/14; Independent Claims; Michalson, ¶293.

e. Claims 7/16 — Confirm Track Cleared

Oriol and Masquelier teach claims 7/16. *See* Ground 1, 7/16; Michalson, ¶¶295-300.

Wise further teaches a user interface that displays the date and time the block was placed, worker associated with block, confirmation that the track is clear before the track block is removed, and date and time when the block was removed. EX1006, Fig. 6D (block placed: “Actually Initiated” in date/time), Fig. 6D (worker fields: “Sentinel ID,” “FirstName,” and “LastName”), Fig. 5H (“S554 COSS rings back when . . . all staff safe & clear of the line.”), Fig. 6D (“ARE ALL STAFF COVERED BY THIS SCN CLEAR OF THE LINE?”), Fig. 6D (block removed: “Actual Withdraw” in date/time), Fig. 5H (“Actual Withdrawn time and any relevant comments” in step S555), 25:4-9, 31:2-6; *see* 3/12, 4/13.

These fields are shown in Wise’s user interface below.

Call Logging - [Work Group - New Call]

File Edit View Group Customer Solution Accessory Report AutoTask Window Help

ARE YOU STOOD IN A POSITION OF SAFETY? ☐

Sentinel ID Issue ☐ Name COSS COSS(P) PTS_ANY
IWA TCOD

Which Business Unit do you work for? Business Function

Planned Resource

Sentinel ID	FirstName	LastName	Contractor	Role	PTS	L/O	HSM	NCCA Sponsor
68	69			☐				
				☐				
				☐				
				☐				
				☐				
				☐				
				☐				
				☐				
				☐				
				☐				

Have you had to change any part of the Planning form details ☐ (Enter any changes made in the Comments field)

Actually Initiated / /

Estimated Withdraw / / (If Estimated Withdrawn is amended, original Time/Date and reason to be entered in Comments field)

Actual Withdraw / / (If Actual Withdrawn is after Estimated Withdrawn a reason is to be entered in Comments field)

ARE ALL STAFF COVERED BY THIS SCN CLEAR OF THE LINE? IF "YES" CLOSED CALL RECORD, IF "No" CALL REMAINS OPEN.

☒ Call Log ☒ Detail ☒ Assignment ☐ Journal

Navigation buttons: << < > >>

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Fig. 6D

Id., 6D; Michalson, ¶¶296-297.

A POSITA would have been motivated to modify Oriol and Masquelier with Wise's user interface to confirm the track is clear before entry of the removal code for ensuring the workers are in a safe position. Michalson, ¶298.

Also, a POSITA would have been motivated to store block placed and removal information above, including the user who specified the confirmation that the track sections have been cleared. *Id.*, ¶299. This would provide a transaction log history to determine if the correct procedures were followed, analyze any error, and train others using the system. *Id.*

There would also be a reasonable expectation of success given Oriol and

Masquelier already store significant information, so the Wise data could be efficiently maintained. *See* Ground 1, 2/11, 3/12, 4/13; EX1004, 39-40; Michalson, ¶300.

f. Claims 23/33 — Only Receive Secret Release Code

See Ground 1, 23/33; Independent Claims; Michalson, ¶304.

g. Claims 24/34 — Store Secret Code

Oriol, Masquelier, and Wise teach claims 24/34 because Wise stores the secret code. Ground 1, 24/34; EX1006, 28:6-12, 31:2-6; *see* 3/12, 4/13; Michalson, ¶305.

h. Claims 25/35 — Store Block Removal Information

See Ground 1, 25/35; claims 7/16; Michalson, ¶306.

i. Claims 26/36 — Store Block Removed Date & Time

See Ground 1, 26/36; claims 7/16; Michalson, ¶307.

j. Claim 41 — Release Track Block Based on Verifying Secret Code

Oriol, Masquelier, and Wise teach claim 41. Ground 1, 41. Michalson, ¶¶308-316.

Oriol, Masquelier, and Wise teach that the generated secret code is stored. *See* 24/34, 3/12, 4/13, Independent Claims.

Wise teaches that when the work is completed, it would transmit the access code to the railway control apparatus. EX1006, 25:4-9 (transmits the same removal code or “SCN number . . . previously . . . allocated to the job” to the central control

system), Fig. 5H; Michalson, ¶¶309-310. Thereafter, “the bulletin board is updated to indicate that that job has successfully been carried out.” *Id.*, 25:10-11.

Given the above, such received code would not have been accepted unless compared to the previously generated code. Michalson, ¶¶311-312.

Otherwise, this would mean Wise’s central control system simply accepts any code to remove the track block, thereby jeopardizing the safety of the workers, which is contrary to the purpose of the code to authorize work. EX1006, 12:6-15, 1:3-7, Title, claims 1, 15-17, 23, 24:19-26, 26:14-23, Fig. 5H; Michalson, ¶313.

A POSITA would have been motivated to modify Oriol and Masquelier with Wise’s verification step to provide another protective mechanism, and there would be a reasonable expectation of success given the straightforward comparison involved. Michalson, ¶¶ 314-316.

Once the codes match, a block removal signal would be transmitted to unblock the track. Ground 1, 1[E].

k. Other Dependent Claims

Oriol, Masquelier, and Wise render the other dependent claims obvious for the reasons discussed in Ground 1. *See* Ground 1 and corresponding dependent claims; *see e.g.*, Michalson, ¶¶294, 301-303.

C. Ground 3: Claims 1-7, 9-16, 18-41 Are Obvious Over Oriol, Masquelier, and Pachl

1. Motivation to Combine; Reasonable Expectation of Success

A POSITA would have been motivated to combine Oriol, Masquelier, and Pachl and had a reasonable expectation of success given the references provide railway control. EX1004, Abstract, 1, 6, 29, 37-38, Figs. A-1-A4, 2, 4; EX1005, Abstract, ix, 3, 5, 10-12, 16, Figs. 1, 4, Table 2; EX1020, 1:33-36, 1:63-66, 2:47-60, 3:22-45, 4:9-15, 4:50-59, Abstract, Figs. 1-2, claim 3; Michalson, ¶317.

There also would have been a motivation to combine and a reasonable expectation of success given that the references implement centralized railway traffic control. EX1004, Abstract, 1, 6, 38, 41, Figs. A-1, A-3; EX1005, ix, 3, 5, 10-12, Fig. 1, Table 2, 72; EX1020, Abstract, 2:47-60, 3:35-45, 4:9-15, Figs. 1-2.

For instance, a POSITA would have been motivated to modify Oriol and Masquelier with Pachl to first block the track and thereafter generate a code (Form D number). Michalson, ¶¶318-319. This modification could enhance safety and security as the central control system would only generate the code once the block has been implemented as otherwise the dispatcher and/or third-party could unsafely or incorrectly use the removal (or secret) code before the track is blocked. Michalson, ¶320.

A POSITA would have a reasonable expectation of success because Oriol and Masquelier could generate a temporary number or other placeholder and then once the safety measure is made effective, generate the Form D number to provide greater security and safety as that removal (secret) code would not be known until the track is blocked. Michalson, ¶321. Indeed, Oriol and Masquelier's railway control apparatus has existing hardware and software to visually block the track and generate and transmit a Form D number. *See* Ground 1, 1[B]-[C]; Michalson, ¶322.

A POSITA would also have been motivated to modify Oriol and Masquelier with Pachl such that the dispatcher in the railway traffic control apparatus only unblocks the track based on the dispatcher entering a received code (transmitted from the worker) in an interface. Michalson, ¶323. This would provide another level of confirmation before the track is unblocked. Michalson, ¶324. It will also ensure the dispatcher is alert to the information provided. *Id.*

A POSITA further would have had a reasonable expectation of success because Oriol already teaches a centralized dispatcher user interface and related software that a POSITA could have modified to include entry of the removal code. Ground 1, 1[Pre], [B]; Michalson, ¶325. Further, Oriol notes that “[t]he system is designed to be highly configurable” which would enable a POSITA to make this obvious modification. EX1004, 41; Michalson, ¶326.

Moreover, given it was known how to enter a code in an interface before permitting train movement (EX1021, 4:10-17, 4:22-27, 4:48-53, 4:54-65, 5:24-30, 5:59-65, claim 1), a POSITA would therefore have had a motivation to combine and a reasonable expectation of success. Michalson, ¶327.

2. Independent Claims

Oriol, Masquelier, and Pachl teach independent claims 1, 10, 19, 20, 30, and 40. Michalson, ¶¶328-335.

Oriol and Masquelier could block the track and then generate the code (Form D number) as shown by Pachl first implementing a safety measure and then generating a code.

Pachl teaches a central control center with a computer interface to first control the track safety measure (“movement permission”) and then generate a “checking code.” *See* Section VIII.E; EX1020, 1:33-36 (“The introduction of the checking code which is specific to the movement permission technically precludes the transmission of a movement permission for which the safety preconditions are not satisfied.”), 3:35-40 (“train control computer to be integrated in the control interface for electronic control systems . . . to control . . . train control sections from one user interface.”), 4:9-15, 1:38-42, 1:63-66, 3:40-45, 1:11-20, Abstract; Michalson, ¶¶329-330.

The Pachl code is secret because it is calculated and only the central control and receiving device can determine the code. EX1020, 2:50-60, 4:7-26, 4:50-59, claim 1, Figs 1-2; Michalson, ¶¶331-332.

Controlling the safety measure (“Permissibility checking of the movement permission” and “Occupation of the assigned track sections”) and then generating the code (“output of the checking code”) is shown in Figure 1. EX1020, Fig. 1.

Oriol and Masquelier could further implement Pachl’s entry of the removal or secret code in an interface to only release the track based on entry of a received code.

Pachl teaches that the train controller (such as a dispatcher) at the control center will only release the track upon entry of a received code in the interface. *Id.*, 4:50-59 (“The train running message and checking code are entered in the train control computer”), 2:47-60 (“train controller” enters a received code and thus **“it is impossible for an associated track section to be released erroneously.”**) (emphasis added), 1:63-66, 4:15-18, claims 1, 5; Michalson, ¶¶333-335.

The entering of the code to release the track is shown in Figure 2, particularly “Input into the train control computer.” EX1020, Fig. 2.

3. Dependent Claims

a. Claims 3/12 — Store Block Information

Oriol, Masquelier, and Pachl teach claims 3/12. Ground 1, 3/12; EX1020, 4:7-26, 3:29-34, 1:54-58, 2:50-60, 4:50-59, Fig. 1, claim 3; Michalson, ¶337.

b. Claims 5/14 — Block and Unblock Track with Code

See Ground 1, 5/14; Independent Claims; Michalson, ¶339.

c. Claims 6/15 — Block Removal Interface

Oriol, Masquelier, and Pachl teach claims 6/15. Ground 1, 6/15; Independent Claims; Michalson, ¶340.

d. Claims 23/33 — Only Receive Secret Release Code

Oriol, Masquelier, and Pachl teach claims 23/33 in that only the control center and user terminal receive the secret release code. Ground 1, 23/33; Independent Claims; EX1020, 4:7-26, Abstract, Figs 1-2, claim 1; Michalson, ¶345.

e. Claims 24/34 — Store Secret Code

Oriol, Masquelier, and Pachl teach claims 24/34. Ground 1, 24/34; EX1020, 2:50-60, 4:7-26, 4:50-59, claim 1, Figs 1-2; Michalson, ¶346.

e. Claims 25/35 — Store Block Removal Information

Oriol, Masquelier, and Pachl teach claims 25/35 in that after the track sections are released, they are stored in the history file in the control center. Ground 1, 25/35; EX1020, 4:56-59, 1:54-58, claims 1, 3, 5, 2:47-60, 3:40-45, Fig. 2; Michalson, ¶¶347-348.

f. Claims 26/36 — Store Block Removed Date & Time

Oriol, Masquelier, and Pachl teach dependent claims 26/36. Ground 1, 26/36.

Pachl further stores the tracks released or blocks removed in its history and the secret code. *See* 25/35; EX1020, 3:29-34, 1:54-58, 4:7-26, 4:56-59, claims 1, 3, 5, 2:47-60, 3:40-45, Figs. 1-2.

It would have been obvious to a POSITA to also store the user who entered the secret code and date and time when tracks released to maintain a safe environment, including auditing this data in case of an error or irregularity and training others. Michalson, ¶¶349-351.

g. Claim 41 — Release Track Block Based on Verifying Secret Code

Oriol, Masquelier, and Pachl teach claim 41. Ground 1, 41. Michalson, ¶¶352-356.

Pachl further teaches that a received secret code at central control is verified as compared to a stored code and only if they match is the track or block released. EX1020, 2:50-60 (“If the entered checking code does not match the calculated checking code, the train running message is rejected. . . . [Thus,] it is impossible for an associated track section to be released erroneously.”), 4:50-59, claim 1, Fig. 2.

A POSITA would have been motivated to modify Oriol and Masquelier with Pachl’s verifying the code to provide another protection mechanism. Michalson, ¶355. There would be a reasonable expectation of success as Oriol and Masquelier

have the hardware and software to store the code and release the track block, so a comparison step could be added. *See* Ground 1, 1[B]-[C], [E]; Michalson, ¶356.

h. Other Dependent Claims

Oriol, Masquelier, and Pachl render the other dependent claims obvious for the reasons discussed in Ground 1. *See* Ground 1 and corresponding dependent claims; *see e.g.*, Michalson, ¶¶336, 338, 341-344.

X. GRAHAM FACTORS (NO SECONDARY CONSIDERATIONS)

The *Graham* factors were discussed for each ground, including the scope of the prior art, the prior art as compared to the claims, and the level of ordinary skill in the pertinent art. *See* Sections VI, VIII-IX.

For the last factor, secondary considerations, Patent Owner has not shown any nexus to the claim language.

XI. NO BASIS FOR DISCRETIONARY DENIAL

A. § 314(a): *Fintiv* and *General Plastic* Factors Favor Institution

The six *Fintiv* factors weigh against discretionary denial. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 6 (PTAB Mar. 20, 2020).

First Factor. This is neutral because Petitioner has not yet moved to stay the Litigation pending IPR, and the PTAB will not speculate on how a district court may rule when a stay is requested. *See Hulu LLC v. SITO Mobile R&D IP, LLC*, IPR2021-00298, Paper 11 at 10-11 (PTAB May 19, 2021).

Second Factor. This favors institution as a Final Written Decision is quite likely before a trial occurs given no trial date is scheduled.

Third Factor. This factor favors institution given the Litigation in its early stage as no discovery, claim construction, and other significant milestones have occurred based on the briefed motion discussed previously.

Fourth Factor. This factor favors institution. Petitioner stipulates that if this RE'835 Patent IPR is instituted, Petitioner will not pursue invalidity grounds in the Litigation of the Challenged Claims on any ground raised, or that could have been reasonably raised in this IPR for the Challenged Claims. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, at 18-19 (PTAB Dec. 1, 2020).

Fifth Factor. This factor should be accorded little weight or is neutral given the Petitioner and Patent Owner are the same parties as in the Litigation.

Sixth Factor. Petitioner's merits are strong, including supporting Michalson declaration.

Additionally, *Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha* factors weigh against discretionary denial because there is no prior petition filed on the challenged claims of the RE'835 Patent. *Id.*, IPR2016-01357, Paper 19, at 16-18 (Sept. 6, 2017).

B. § 325(d): *Advanced Bionics* Favors Institution

Denial under § 325(d) is not warranted under *Advanced Bionics*’ two-factor test. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, at 8 (PTAB Feb. 13, 2020).

The first factor is not met of the “same or substantially the same prior art or arguments previously were presented to the Office” (*id.*) given the specific grounds here were not considered during prosecution of the RE’835 Patent. Thus, there is no need to analyze the second factor. *Sony Group Corp. v. MZ Audio Sciences, LLC*, IPR2022-01544, Paper No. 12, at 7 (PTAB Apr. 21, 2023).

XII. CONCLUSION

Petitioner requests *inter partes* review and cancellation of claims 1-7, 9-16, 18-41 of RE’835 Patent.

DATED: July 6, 2023

Respectfully submitted,

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CERTIFICATION OF COMPLIANCE UNDER 37 CFR § 42.24(d)

Pursuant to 37 C.F.R. §42.24(d), Petitioner certifies that this Petition for *Inter Partes* Review has total 13,800 words as counted by Microsoft Word, exclusive of the cover page, table of contents, table of authorities, mandatory notices under §42.8, certificate of service, word count, appendix of exhibits or claim listing, and signature block (37 CFR § 42.24(a)). This is within the 14,000 word limit allowed under §42.24(a)(1)(i).

DATED: July 6, 2023

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on July 6, 2023 I caused a true and correct copy of the foregoing materials:

- Petition for *Inter Partes* Review of U.S. Patent RE47835
- Exhibits
- Petitioner's Power of Attorney

to be served via overnight delivery on the USPTO Patent Center (PAIR)

Correspondence Address for U.S. Patent RE47835 as follows:

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I also caused a courtesy copy of the foregoing materials to be served via email on Railware's counsel of record in the district court litigation:

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