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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jeffrey	D.	Kernwein	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Cedar Rapids	State/Province	IA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	2532 L. Avenue NW
Address 2	
City	Cedar Rapids
State/Province	IA
Postal Code	52405
Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Karen	A.	Shaw	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Cedar Rapids	State/Province	IA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	225 Wasatch Court NE
Address 2	
City	Cedar Rapids
State/Province	IA
Postal Code	52402
Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas	Paul	Spiegelhalter	Jr.

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

Wabtec v. Railware, Inc.
IPR2026-00135
EX2018 - 0001

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

City	Cedar Rapids	State/Province	IA	Country of Residence i	US

Mailing Address of Inventor:

Address 1	9160 Darrell Drive		
Address 2			
City	Cedar Rapids	**State/Province**	IA
Postal Code	52411	**Country i**	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	28289		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions		
Attorney Docket Number	4293-1606329	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	**Suggested Figure for Publication (if any)**	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country i

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	28289		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Claims benefit of provisional	62406144	2016-10-10

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Westinghouse Air Brake Technologies Corporation		
Mailing Address Information For Applicant:			
Address 1	1001 Air Brake Avenue		
Address 2			
City	Wilmerding	**State/Province**	PA
Country	US	Postal Code	15148
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Christian D. Ehret/			Date (YYYY-MM-DD)	2017-10-06
First Name	Christian D.	Last Name	Ehret	Registration Number	67,743

Additional Signature may be generated within this form by selecting the Add button. Add

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	4293-1606329
	Application Number	
Title of Invention	System, Method, and Computer Program Product for Verifying Railroad Work Zone Instructions	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/726,446	10/06/2017	Jeffrey D. Kernwein	WABP13191USUTL1 552-771US	1054

91959 7590 01/07/2020
The Small Patent Law Group, LLC
225 S. Meramec, Suite 725
St. Louis, MO 63105

EXAMINER
KUHFUSS, ZACHARY L

ART UNIT	PAPER NUMBER
3617	

NOTIFICATION DATE	DELIVERY MODE
01/07/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docket@splglaw.com
TransportationPatentCorrespondence@ge.com
john.kramer1@ge.com

Office Action Summary	Application No. 15/726,446	Applicant(s) Kernwein et al.	
	Examiner ZACHARY L KUHFUSS	Art Unit 3617	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 12 June 2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-10 and 13-22 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-10 and 13-22 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 06 October 2017 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 20180423.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claim Objections

Claim 10 is objected to because of the following informalities:

Claim 10 begins with the limitation of “switching operating modes” and does not indicate proper dependency from a previous claim. The Examiner suggests amending claim 10 to depend from a previous claim (e.g. inserting “The computer-implemented method of claim 1, further comprising”). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

Claims 1, 3-10, 13-14, and 16-22 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Cross et al. (US 2014/0104081).

Referring to Claim 1: Cross discloses a computer-implemented method, comprising:

receiving, by an on-board system (103) of a mobile equipment, at least one electronic work zone (106) instruction message (alert signal) from a message device (102) (Para. [0042]) (Fig. 1);

transmitting at least one instruction diagram (AVL signal) that is based at least partially on the electronic work zone instruction message from the on-board system (103) to the message device (102) (Para. [0044]);

receiving, by the on-board system (103), a verification (high alert packet) from the message device (102) (Para. [0050]); and

in response to receiving the verification, operating the mobile equipment in a mode (alert mode) according to at least one work zone instruction parameter (Para. [0043] and [0050]).

Referring to Claims 3 and 16: Cross discloses a method, further comprising generating the at least one instruction diagram (AVL signal) by extracting a plurality of work zone instruction parameters from the work zone instruction message (alert signal) (Para. [0042]); and converting the plurality of work zone instruction parameters to the instruction diagram (Para. [0044]).

Referring to Claims 4 and 17: Cross discloses a method, wherein the at least one work zone instruction (AVL) is received from a back office system (104) (Para. [0042]), and

wherein the back office system (104) receives the at least one work zone instruction message (alert signal) from the message device (102) (Para. [0049]).

Referring to Claims 5 and 18: Cross discloses a method, wherein the back office system, after receiving the at least one work zone instruction message (alert signal) (Para. [0042]), extracts a plurality of work zone instruction parameters from the work zone instruction message (Para. [0037]) and transforms the plurality of work zone instruction parameters to a route data framework associated with the on-board system (Para. [0043]).

Referring to Claims 6 and 19: Cross discloses a method, wherein the at least one work zone (106) instruction message (alert signal) comprises at least one of the following work zone instruction parameters: work zone limits, a work zone speed restriction, a work zone route, or a combination thereof (Para. [0042]).

Referring to Claims 7 and 20: Cross discloses a method, wherein the work zone instruction parameter is a work zone route selected from a plurality of possible routes (108) (Para. [0042] and [0043]) (Fig. 3) (i.e. Cross's work zone route is a reduced speed route relative to a normal cruising speed route).

Referring to Claims 8 and 21: Cross discloses a method, wherein the work zone instruction is work zone speed restriction (Para. [0042] and [0043]) (i.e. Cross's work

zone instruction is a reduced speed instruction relative to a normal cruising speed instruction).

Referring to Claim 9: Cross discloses a method, further comprising requesting, by the on-board system (103), the at least one work zone instruction message from the message device (102), and thereby to prompt the message device (102) to send the work zone instruction in response to the request (Para. [0049]) (i.e. the location data sent by VCU 103 to PNU 102 may be broadly interpreted as a request, and the alert mode condition identified by the PNU 102 may be interpreted as a work zone instruction).

Referring to Claim 10: Cross discloses a method, further comprising switching operating modes (switching to an alert mode) of an on board system (103) of a mobile equipment to operate the mobile equipment in accordance with at least one work zone instruction parameter of a work zone instruction message in response to a work zone instruction message being received by the on board system (103) from a message device (102) (Para. [0050] and [0043]).

Referring to Claim 13: Cross discloses an on board system (103) comprising:
a controller configured to: (i) receive at least one work zone instruction message (alert signal) from a message device (102) (Para. [0042]); (ii) generate an instruction diagram (AVL signal) based at least partially on the work zone instruction message (Para. [0044]); (iii) transmit the instruction diagram (AVL signal) to the message device (102)

(Para. [0044]); (iv) receive a verification (high alert packet) or a rejection of the instruction diagram from the message device (Para. [0050]); and (v) in response to receiving a verification, operate the mobile equipment in accordance with the work zone instruction message (Para. [0043]).

Referring to Claim 14: Cross discloses a system, wherein the message device (102) is a portable computing device (Para. [0051]) including at least one processor programmed or configured to: (i) receive user input; (ii) generate the work zone instruction message based on the user input; (iii) receive the instruction diagram from the on-board control system; (iv) display the instruction diagram; and (v) receive the approval or the rejection (Para. [0049]).

Referring to Claim 22: Cross discloses a system, wherein the work zone instruction is work zone limit comprising a geographical feature of the work zone (106) (Para. [0057]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 15 are rejected under 35 U.S.C. 103 as being unpatentable over Cross in view of Sheardown (US 8,344,877).

Referring to Claims 2 and 15: Cross teaches a method, wherein the at least one instruction diagram (AVL) comprises one or more textual instructions (Para. [0044]).

Cross does not teach that the instruction diagram comprises a visual route diagram. However, Sheardown teaches a track worker safety system, wherein the track workers (40) are provided a mobile safety device with a display that includes "a visual representation of the different rail roads and/or roads present in the vicinity along with train route maps including direction of travel of each rail vehicle." (Col. 13, lines 39-47) (Fig. 18). It would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention, for Cross to send track workers a visual route diagram using a mobile safety device with a display, as taught by Sheardown, in addition to the text instructions sent to the track workers in order to enhance worker safety. The motivation for providing a visual route diagram "is that a track worker carrying the mobile device will immediately know in real time when an alarm is received, [and] which of the present rail roads are possible paths for approaching rail vehicles." (Sheardown, Col. 13, lines 49-53).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US-20180099684; US-20190283787; US-20190337545; US-20190263432; US-20190092359; US-20180312181; US-20180281832; US-20180244292; US-20180043913; US-20150367873; US-20130166114; US-20110226910; US-9878729; US-8786428; US-10518792; US-10347106; US-10336353; US-10207726; US-10179596; US-10179595; US-10106079; US-10029716; US-

9902411; US-9767968; US-9542852; US-8952805; US-8630758; US-7624952; US-6145792; US-5924651; US-5727758; US-6232887; US-6371416; US-9517782; and US-9403545.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZACHARY L KUHFUSS whose telephone number is (571)270-7858. The examiner can normally be reached on Monday - Friday 10:00am to 6:00 pm CDT.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samuel (Joe) Morano can be reached on (571)272-6682. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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/ZACHARY L KUHFUSS/
Primary Examiner, Art Unit 3617

Notice of References Cited	Application/Control No. 15/726,446	Applicant(s)/Patent Under Reexamination Kernwein et al.	
	Examiner ZACHARY L KUHFUSS	Art Unit 3617	Page 1 of 3

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Notice of References Cited	Application/Control No. 15/726,446	Applicant(s)/Patent Under Reexamination Kernwein et al.	
	Examiner ZACHARY L KUHFUSS	Art Unit 3617	Page 2 of 3

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	Examiner ZACHARY L KUHFUSS	Art Unit 3617	Page 3 of 3

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