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JC973 U.S. PTO 10/267959 10/10/02

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	3805-001-27
First Inventor or Application Identifier	Mark Edward Kane
Title	METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ■ Fee Transmittal Form (e.g. PTO/SB/17) (Submit an original and a duplicate for fee processing)
   ■ Applicant claims small entity status.
2. ■ Specification — Total Pages: 25
3. ■ Drawing(s) *(35 U.S.C. 113)* — Total Sheets: 4
4. ■ Oath or Declaration — Total Pages: 3
   a. ■ Newly executed (original or copy)
   b. □ Copy from a prior application *(37 C.F.R. §1.63(d))* *(for continuation/divisional with box 16 completed)*
5. □ Incorporation By Reference *(usable if box 4B is checked)* The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4B, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein

ACCOMPANYING DOCUMENTS

6. ■ Assignment Papers (cover sheet & document(s))
7. □ 37 C.F.R. §3.73(b) Statement *(when there is an assignee)* □ Power of Attorney
8. □ English Translation Document *(if applicable)*
9. □ Information Disclosure Statement (IDS)/PTO-1449 □ Copies of IDS Citations
10. □ Preliminary Amendment
11. ■ White Advance Serial No. Postcard
12. □ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
13. □ Request for Priority
14. □ List of Inventors' Names and Addresses
15. □ Other:

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below:
    □ Continuation □ Divisional □ Continuation-in-part (CIP) of prior application no.:
    Prior application information: Examiner: Group Art Unit:

17. Amend the specification by inserting before the first line the sentence:
    □ This application is a □ Continuation □ Division □ Continuation-in-part (CIP) of application Serial No. Filed on
    □ This application claims priority of provisional application Serial No. Filed

18. CORRESPONDENCE ADDRESS

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10267959_101002

FEE TRANSMITTAL

Docket No.	3805-001-27
Serial No.	New Application
Filing Date	Herewith
Inventor(s)	Mark Edward KANE, et al.
Group Art Unit	
Examiner	

TOTAL AMOUNT OF PAYMENT $986.00

1. ■ Applicant claims small entity status.

□ Charge any **UNDERPAYMENT** or credit any **OVERPAYMENT** in the indicated fees to Deposit Account No. 50-1442.

□ Charge the indicated fees to Deposit Account No 50-1442.

2. ■ Check enclosed.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	740	2001	370	Utility filing fee	370.00
1002	330	2002	165	Design filing fee	
1003	510	2003	255	Plant filing fee	
1004	740	2004	370	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
				SUBTOTAL (1)	$370.00

2. EXTRA CLAIM FEES

tot. claims	70	-	20*	=	50	x	$9	=	450
ind. claims	6	-	3*	=	3	x	$42	=	126
□ Multiple Dependent Claims							$140	=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	84	2201	42	Independent claims in excess of 3
1203	280	2203	140	Multiple dependent claim, if not paid
1204	84	2204	42	*Reissue independent claims over original patent
1205	18	2205	9	*Reissue claims in excess of 20 and over original patent
				SUBTOTAL (2) $576.00

* or number previously paid, if greater, For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge-late filing fee or oath	
1052	50	2052	25	Surcharge-late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2520	1812	2520	Ex parte reexam fee	
1251	110	2251	55	1-mo ext of time	
1252	400	2252	200	2-mo ext of time	
1253	920	2253	460	3-mo ext of time	
1254	1440	2254	720	4-mo ext of time	
1255	1960	2255	980	5-mo ext of time	
1401	320	2401	160	Notice of Appeal	
1402	320	2402	160	Appeal Brief	
1403	280	2403	140	Request for Oral Hearing	
1501	1280	2501	640	Utility/Reissue Issue Fee	
1502	460	2502	230	Design Issue Fee	
1503	620	2503	310	Plant Issue Fee	
1460	130	1460	130	Petitions to the Commissioner	
1806	180	1806	180	IDS Submission	
8021	40	8021	40	Assignment	40.00
1801	740	2801	370	For Filing RCE	
1802	900	1802	900	Expedited Design	
OTHER (indicate below)					
				SUBTOTAL (3)	$40.00

Name	Steven B. Kelber	Registration No.	30,073		
Signature		Date	October 10, 2002	Telephone	202-861-3900
Name	James M. Heintz	Registration No.	41,828		

DOCKET NO: 3805-001-27

TITLE OF THE INVENTION

METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates to railroads generally, and more particularly to a method and system for ensuring that a train does not pass a device such as a grade crossing gate or a track switch when that device is not properly configured.

Discussion of the Background

Train safety has always been a concern in the railroad industry. If anything, this concern has increased in recent years. This concern has led to proposals for and development of automated, safety-enhancing systems such as Automatic Train Control (ATC), Positive Train Control (PTC), and others. While such systems vary in their implementation, one goal they all share is to avoid accidents.

One source of accidents is an improperly set switch. Historically, an engineer or conductor would visually verify that a switch has been set to the correct position. However, engineers and conductors, being human, sometimes make mistakes, including traveling too fast such that there is not sufficient time to stop the train when the signal is first visible, not activating the brakes a sufficient distance from the switch, failing to notice that the switch has been improperly set, and even forgetting to look at the switch. The results of such mistakes can be disastrous.

Another source of accidents is a malfunctioning grade crossing gate. Grade crossing gates may be triggered by radar, by a track circuit, or by a mechanical switch set at a position far enough away from the crossing gate such that the gate will have sufficient time to go down when triggered by a train traveling at the maximum allowable speed. Some gates are equipped with monitoring equipment that can determine if the gate is malfunctioning and, in some cases, sends a message via telephone or radio informing the dispatcher of a malfunction. The dispatcher is then required to broadcast this information to all other trains that pass the grade crossing.

What is needed is a method and apparatus that ensures that a train will not pass a switch, grade crossing gate, or other device that is not properly configured.

SUMMARY OF THE INVENTION

The present invention meets the aforementioned need to a great extent by providing a computerized train control system in which a control module determines a position of a train using a positioning system such as a global positioning system (GPS), consults a database to determine when the train is approaching a configurable device such as a switch or grade crossing gate, continuously interrogates the device to determine its status as the train approaches the device, and forces an engineer/conductor to acknowledge any detected malfunction. A malfunction can be reported by the device itself, or can be declared by the system if the device fails to respond to initial or subsequent interrogations. In some embodiments of the invention, the train is forced to come to a complete stop before proceeding past the device. In other embodiments, the train will slow

to a speed that will allow the engineer/conductor to visually determine whether it is safe to proceed past the device if the engineer/conductor acknowledges a message warning of the malfunction and will stop the train if the engineer/conductor fails to acknowledge the warning message.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the invention and many of the attendant features and advantages thereof will be readily obtained as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

Figure 1 is a logical block diagram of a train control system according to one embodiment of the invention.

Figure 2 is a flow chart of a device interrogation method according to another embodiment of the invention.

Figures 3a and 3b are a flow chart of a device interrogation method according to a third embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will be discussed with reference to preferred embodiments of train control systems. Specific details, such as specific algorithms and hardware, are set forth in order to provide a thorough understanding of the present invention. The preferred embodiments discussed herein should not be understood to limit the invention. Furthermore, for ease of understanding, certain

method steps are delineated as separate steps; however, these steps should not be construed as necessarily distinct nor order dependent in their performance.

Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, Figure 1 is a logical block diagram of a train control system 100 according to an embodiment of the present invention. The system 100 includes a control module 110, which typically, but not necessarily, includes a microprocessor. The control module 110 is responsible for controlling the other components of the system.

A positioning system 120 is connected to the control module 110. The positioning system supplies the position (and, in some cases, the speed) of the train to the control module 110. The positioning can be of any type, including a global positioning system (GPS), a differential GPS, an inertial navigation system (INS), or a Loran system. Such positioning systems are well known in the art and will not be discussed in further detail herein. (As used herein, the term "positioning system" refers to the portion of a positioning system that is commonly located on a mobile vehicle, which may or may not comprise the entire system. Thus, for example, in connection with a global positioning system, the term "positioning system" as used herein refers to a GPS receiver and does not include the satellites that transmit information to the GPS receiver.)

A map database 130 is also connected to the control module 110. The map database 130 preferably comprises a non-volatile memory such as a hard disk, flash memory, CD-ROM or other storage device, on which map data is stored. Other types of memory, including volatile memory, may also be used. The map data preferably includes positions of all configurable devices such as switches and grade

crossing gates. The map data preferably also includes information concerning the direction and grade of the track in the railway. By using train position information obtained from the positioning system 120 as an index into the map database 140, the control module 110 can determine its position relative to configurable devices.

When the control module 110 determines that a configurable device 180 (which includes a transceiver 190) is present, it interrogates the device 180 through transceiver 150. The transceiver 150 can be configured for any type of communication, including communicating through rails and wireless. In addition to communicating with configurable devices 180, the transceiver 150 may communicate with a dispatcher (not shown in Figure 1).

Also connected to the control module 110 is a brake interface 160. The brake interface 160 monitors the train brakes and allows the control module 110 to activate and control the brakes to stop or slow the train when necessary.

A warning device 170 is also connected to the control module 110. The warning device 170 is used to warn the conductor/engineer that a malfunction has been detected. The warning device 170 may also be used to allow the engineer/ conductor to acknowledge the warning. In some embodiments, the warning device 170 is in the form of button on an operator display such as the display illustrated in co-pending U.S. application serial number 10/186,426, entitled "Train Control System and Method of Controlling a Train or Trains" filed July 2, 2002, the contents of which are hereby incorporated by reference herein. In other embodiments, the warning device 170 may be a stand alone button that illuminates when a malfunction is detected. In yet other embodiments (e.g., those in which no

acknowledgment of a warning is required), the warning device 170 may comprise or consist of a horn or other device capable of providing an audible warning.

Figure 2 is a flowchart 200 illustrating operation of the processor 110 in connection with configurable devices 180. The control module 110 determines the train's current position from information provided by the positioning system 120 at step 210. The control module then obtains the locations of nearby configurable devices 180 from the map database 130 at step 212. If no configurable device 180 is withing a threshold distance, steps 210 et seq. are repeated. If a configurable device 180 is within a threshold distance at step 214, the device is interrogated at step 216.

In some embodiments, this threshold distance is predetermined distance based in part upon a worst case assumption (i.e., an assumption that a train having the greatest possible weight is traveling at a maximum allowable or possible speed in a downhill direction on a portion of track with the steepest grade in the system). In other embodiments, the threshold is based on the actual speed and weight of the train and the grade of the track between the train and the device. In still other embodiments, the calculation may take into account the distribution of weight in the train this will effect the required stopping distance as discussed in the aforementioned co-pending U.S. patent application.

In some embodiments, the interrogation includes an identification number associated with the device 180. Since only the device corresponding to the identification number will respond to the interrogation, this identification number is obtained from the map database 130. This avoids contention between multiple devices attempting to respond to the interrogation on the same frequency.

If the configurable device 180 fails to respond at step 218, or reports an incorrect configuration at step 220, the control module notifies the conductor/engineer of the malfunction at step 224. If, in response to the notification, the operator fails to activate the brakes at step 226, the control module 110 automatically activates the brakes to bring the train to a halt at step 228. At this point, the conductor/engineer must restart the train, which preferably requires the conductor/engineer to acknowledge the warning provided at step 224.

If the device 180 responds to the interrogation at step 218 and reports a correct configuration at step 220, then, at step 222, the control module 110 returns to step 216 if the device 180 has not been passed, or returns to step 210 to repeat the process for the next configurable device 180. Returning to step 216 to interrogate the device multiple times as the train approaches the device is important for safety purposes. This will detect malfunctions or changes in configuration after the initial interrogation (e.g., someone throwing the switch into the wrong position after the initial interrogation but before the train reaches the switch) from causing and accident. Whether or not the interrogation of step 318 includes the device's identification number, it is preferable for the device's response to include its identification number as this allows for greater assurance that a response from some other source has not been mistaken as a response from the device.

Figures 3a and 3b together form a flowchart 300 illustrating operation of the control unit 110 in connection with configurable devices 180 according to a second embodiment of the invention. Steps 310-322 of the flowchart 300 are similar to steps 210-222 of the flowchart 200 of Figure 2; therefore, the detailed discussion of these steps will not be repeated. If a configurable device 180 does

not respond at step 318 or reports an incorrect configuration at step 320 after being interrogated at step 316, the control module 110 then activates the warning device 170 to inform the conductor/engineer of the problem at step 330. A time period within which the operator must acknowledge the warning and slow the train to a reduced speed is associated with the warning. This time period may be a predetermined number based on a worst-case stopping distance, or may be calculated dynamically based on factors such as the current speed of the train, the braking characteristics of the brakes on the train, the weight of the train, the distribution of weight on the train, and/or the grade of the track as determined from the map database 130 using the train position from the positioning system 120, or other factors as discussed in the above-referenced co-pending U.S. patent application.

If the operator acknowledges the warning at step 332 and sufficiently slowed the train at step 334 within the allowable time period, the control module 110 monitors the speed of the train to ensure that the reduced speed is maintained at step 336 until either the train has passed the device 180 at step 338 or the conductor/engineer verifies that he has visually determined that the device is configured properly at step 340. In the case of a configurable device such as a grade crossing gate, this allows the train to continue moving past the gate at a slow speed. In the case of an incorrectly thrown switch, it is expected that the conductor/engineer will stop the train if the switch cannot be set to the correct position before the train reaches it; however, there may be some circumstances in which the conductor/engineer desires to allow the train to continue past an incorrectly thrown switch. Because the conductor/engineer was forced to

acknowledge the warning about the improperly configured switch, it is unlikely that allowing the train to proceed past the improperly configured switch is not intentional. In other embodiments, a train may not be allowed to pass the switch until it has come to a complete stop, but may be allowed to pass an improperly configured grade crossing gate at a reduced speed without first coming to a complete stop.

If the conductor/engineer fails to acknowledge the warning at step 334 within the allowed time period, the control module 110 commands the brake interface to stop the train at step 342. The control module 110 then notifies the dispatcher of the stopped train at step 344.

At steps 220 and 320 above, the control module 110 determines whether the device 180 is properly configured. This determination is necessarily device dependent. For example, in the case of a switch, the determination as to whether the device is configured correctly is preferably made with respect to warrants/authorities and/or route information issued to the train. That is, the control module 110 preferably stores information as to what route the train is to take and what warrants (also sometimes referred to as authorities) have been issued for that train. In the case of a grade crossing gate, determining that the device is configured properly comprises more than determining that the gate is in the down position. Many such devices are designed such that a failure results in the gate being placed in the down position. However, in the event of such a failure, it can be expected that some cars and/or pedestrians may attempt to cross the tracks even though the gate is down. Thus, if the crossing gate reports a malfunction, it is

preferably treated as if it is not properly configured despite the fact that the gates may be reported as being in the down position.

It should be understood that any and all of the aforementioned events (e.g., the acknowledgment or lack thereof of a warning from an engineer/conductor, the stopping of the train upon a detection of an improperly configured device) may be recorded by the event recorder 140. It should also be understood that, in some embodiments, some configurable devices 180 may be configured by sending commands from the train. In such embodiments, the control module 110 will send the appropriate command via the transceiver 150 on the train to the device 180 via its transceiver 190.

One advantage of those embodiments of the invention in which a configurable device is interrogated as the train approaches is that such devices are not required to transmit information when trains are not in the area. This saves power as compared to those systems in which wayside devices continuously or periodically transmit information regardless of whether a train is close enough to receive such information.

In the embodiments discussed above, the control module 110 is located on the train. It should also be noted that some or all of the functions performed by the control module 110 could be performed by a remotely located processing unit such as processing unit located at a central dispatcher. In such embodiments, information from devices on the train (e.g., the brake interface 160) is communicated to the remotely located processing unit via the transceiver 150.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

WHAT IS CLAIMED IS:

1. A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise.

2. The system of Claim 1, wherein the device is a grade crossing gate.

3. The system of Claim 1, wherein the device is a switch.

4. The system of Claim 1, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

5. The system of Claim 1, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

6. The system of Claim 1, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

7. The system of Claim 6, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

8. The system of Claim 7, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

9. The system of Claim 7, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

10. The system of Claim 9, wherein the threshold is further based on a weight of the train.

11. The system of Claim 9, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

12. The system of Claim 11, wherein the threshold is further based on distribution of weight in the train.

13. The system of Claim 1, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

14. The system of Claim 13, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

15. A method for controlling a train comprising the steps of:

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

16. The method of Claim 15, wherein the device is a grade crossing gate.

17. The method of Claim 15, wherein the device is a switch.

18. The method of Claim 16, further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information.

19. The method of Claim 15, wherein the response includes an identification number of the device and the method further comprises the step of

confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

20. The method of Claim 15, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

21. The method of Claim 15, further comprising the steps of:

identifying a configurable device in a database which is a next device which the train will pass based on information from a positioning system located on the train; and

obtaining an identification number associated with the device identified in the identifying step from the database.

22. The method of Claim 21, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

23. The method of Claim 22, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

24. The method of Claim 22, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

25. The method of Claim 24, wherein the threshold is further based on a weight of the train.

26. The method of Claim 24, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

27. The method of Claim 26, wherein the threshold is further based on distribution of weight in the train.

28. The method of Claim 15, further comprising the step of activating a warning device when a response with a correct configuration is not received.

29. The method of Claim 28, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

30. A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

31. The system of Claim 30, wherein the device is a grade crossing gate.

32. The system of Claim 30, wherein the device is a switch.

33. The system of Claim 30, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

34. The system of Claim 30, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

35. The system of Claim 30, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

36. The system of Claim 35, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

37. The system of Claim 35, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

38. The system of Claim 35, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

39. The system of Claim 38, wherein the threshold is further based on a weight of the train.

40. The system of Claim 38, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

41. The system of Claim 40, wherein the threshold is further based on distribution of weight in the train.

42. The system of Claim 30, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

43. The system of Claim 42, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

44. The system of Claim 30, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

45. The system of Claim 30, further comprising a positioning system in communication with the control unit and located on the train, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train. track.

46. The system of Claim 45, further comprising a track database in communication with the control unit, wherein the period of time is further based on a grade of a section of track between the train and the device.

47. A method for controlling a train comprising the steps of:

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if a response with a correct configuration is not received or if no response is received,

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

48. The method of Claim 47, wherein the device is a grade crossing gate.

49. The method of Claim 47, wherein the device is a switch.

50. The method of Claim 47, wherein the response includes an identification number of the device and further comprising the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

51. The method of Claim 47, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

52. The method of Claim 47, further comprising the steps of:

identifying a configurable device in the database which is a next device which the train will pass based on information from a positioning system; and

obtaining an identification number associated with the device identified in the identifying step from a database.

53. The method of Claim 52, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

54. The method of Claim 52, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

55. The method of Claim 52, further comprising the step of calculating the threshold based at least in part upon the current speed of the train.

56. The method of Claim 55, wherein the threshold is further based on a weight of the train.

57. The method of Claim 55, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

58. The method of Claim 57, wherein the threshold is further based on distribution of weight in the train.

59. The method of Claim 47, further comprising the step of activating a warning device when a response with a correct configuration is not received.

60. The method of Claim 59, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

61. The method of Claim 47, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

62. The method of Claim 47, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train.

63. The method of Claim 62, wherein the period of time is further based on a grade of a section of track between the train and the device.

64. The method of Claim 63, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a

memory and determining whether a configuration received from the switch is correct by comparing a direction of the switch to a desired direction of the switch based on the route information.

65. A method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

stopping the train if a response from the device indicates that the device is not properly configured or if a response is not received within the period of time.

66. The method of Claim 65, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

67. The method of Claim 65, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

68. A computerized method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a first period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the first period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

providing a warning to an operator if a response from the device indicates that the device is not properly configured or if a response is not received within the first period of time;

stopping the train if the operator does not acknowledge the warning and slow the train to a reduced speed within a second period of time; and

if the warning is acknowledged and the reduced speed is achieved within the second period of time, maintaining the reduced speed until the operator verifies that the device is configured properly or until the train has passed the device;

69. The method of Claim 68, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

70. The method of Claim 68, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a

memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

ABSTRACT

A train control system includes a positioning system and consults a database to determine when the train is approaching a configurable device such as a switch or grade crossing gate. The system continuously interrogates the device to determine its status as the train approaches the device, and forces an engineer/conductor to acknowledge any detected malfunction. The train is forced to come to a complete stop before proceeding past the device or may be slowed down to a speed that will allow the engineer/conductor to visually determine whether it is safe to proceed past the device if the engineer/conductor acknowledges a message warning of the malfunction and will stop the train if the engineer/conductor fails to acknowledge the warning message.

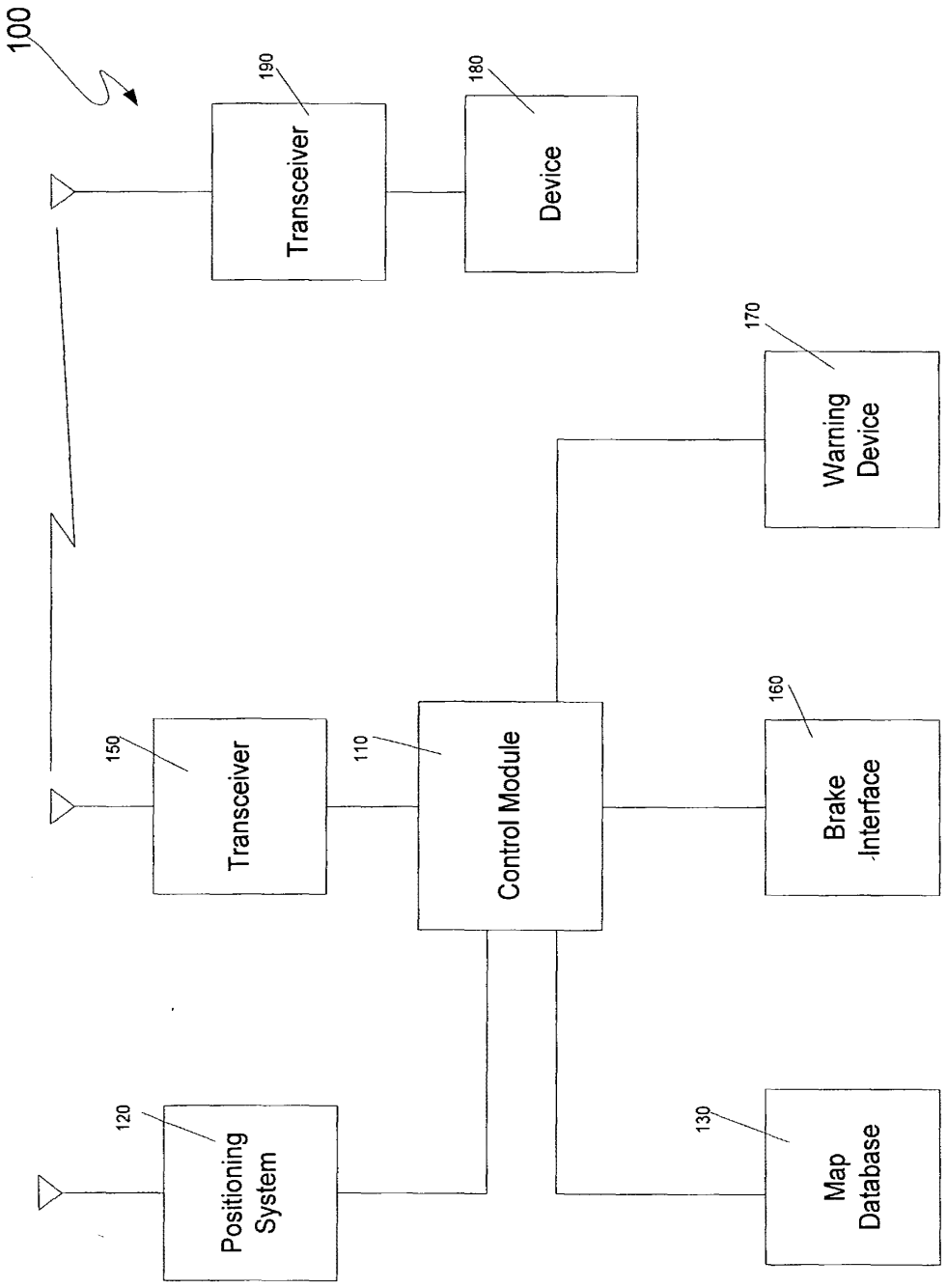

100
190
Transceiver
180
Device
170
Warning Device
150
Transceiver
110
Control Module
160
Brake Interface
120
Positioning System
130
Map Database

Figure 1

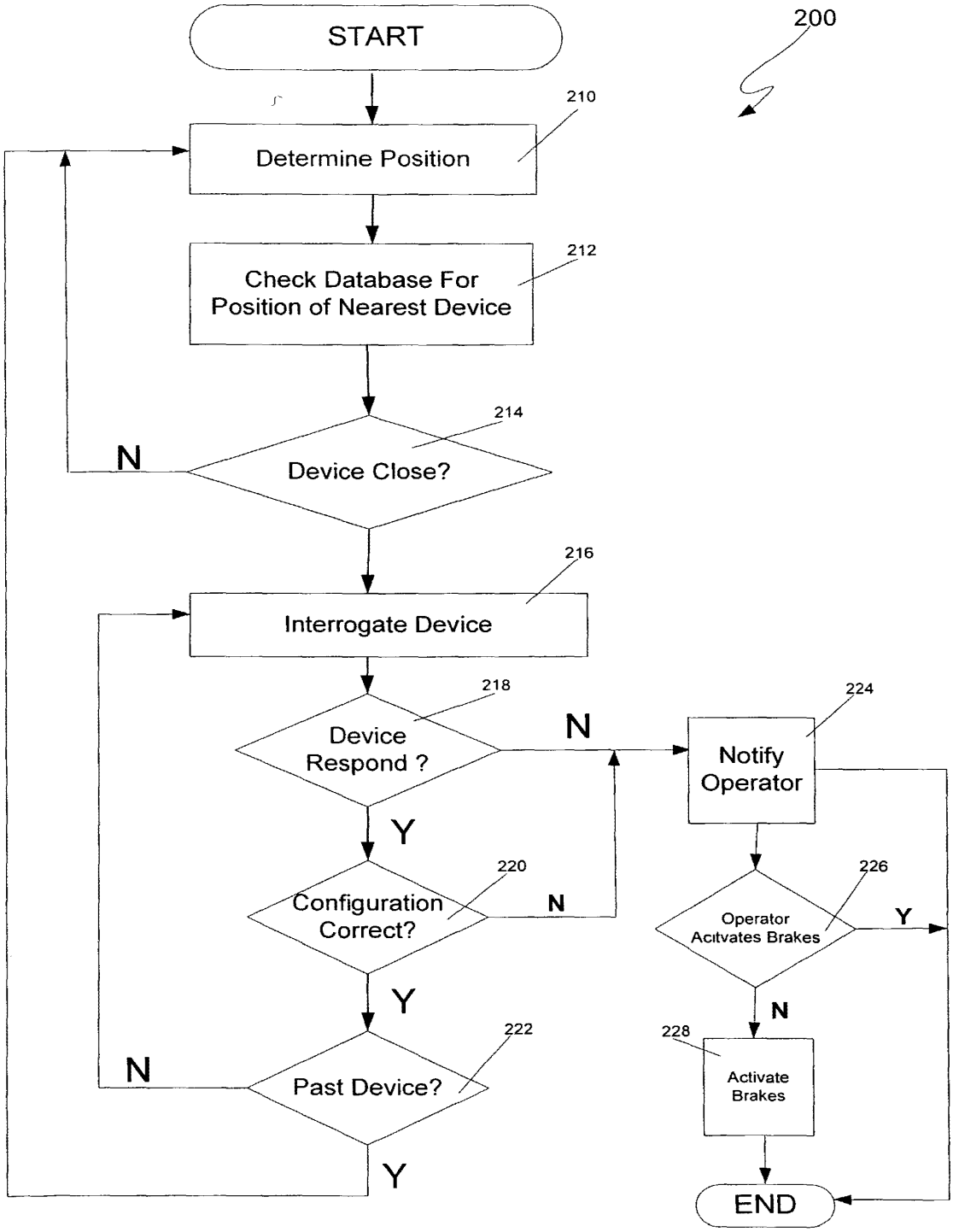

START
200
210
Determine Position
212
Check Database For Position of Nearest Device
214
Device Close?
N
216
Interrogate Device
218
Device Respond ?
N
Y
220
Configuration Correct?
N
Y
222
Past Device?
N
Y
224
Notify Operator
226
Operator Acitvates Brakes
Y
N
228
Activate Brakes
END

Figure 2

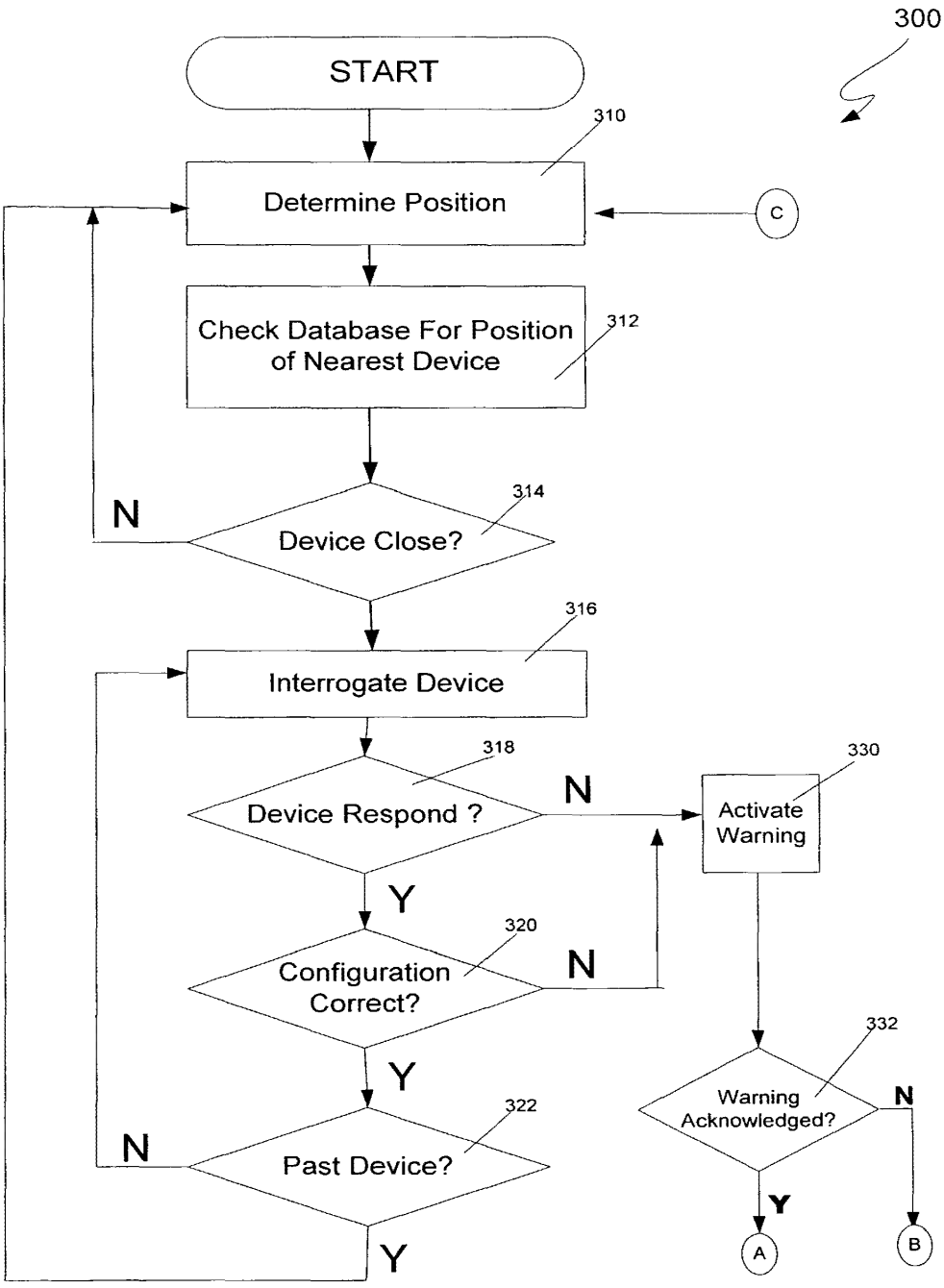
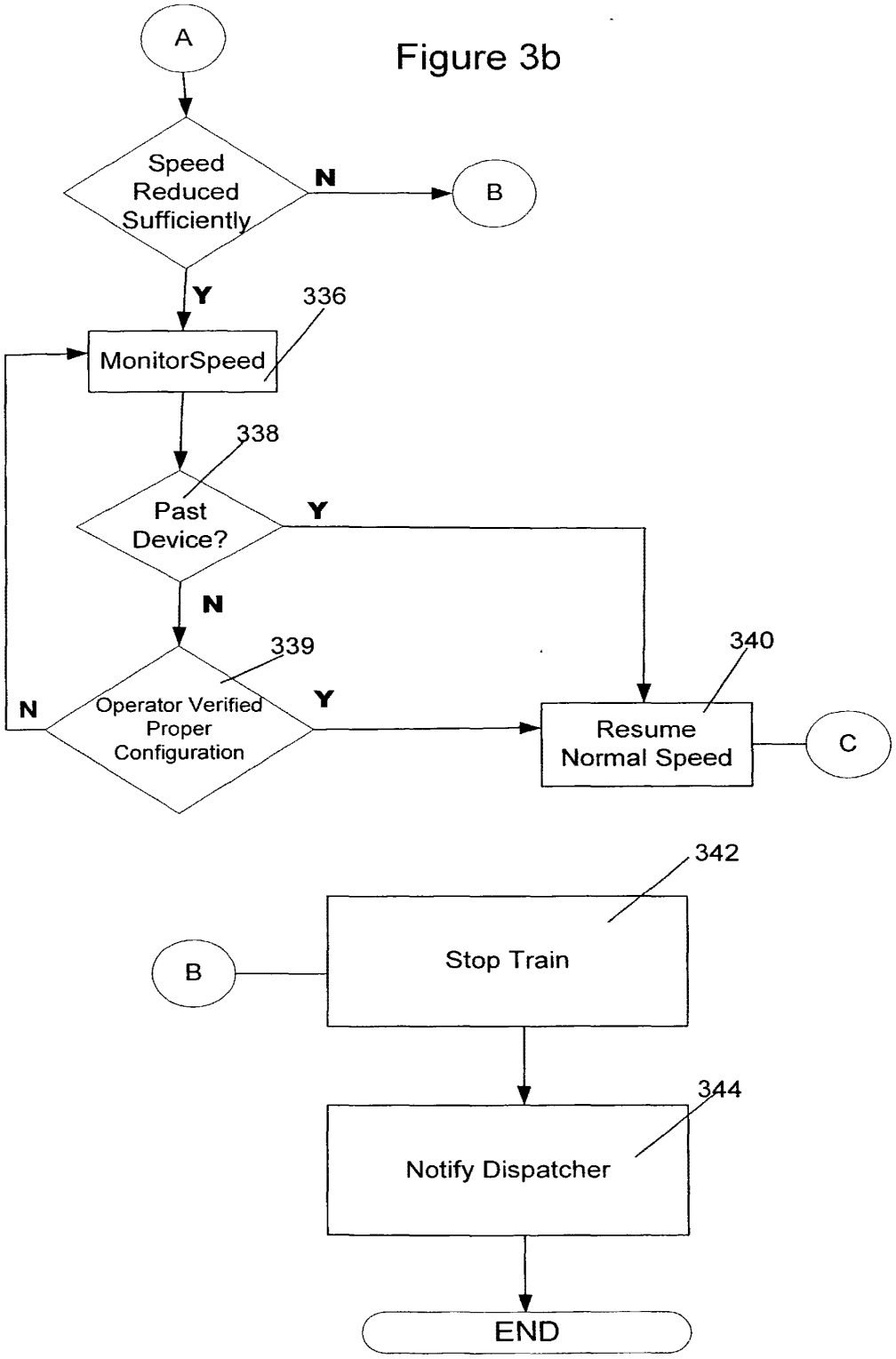

300
START
310
Determine Position
C
Check Database For Position of Nearest Device
312
N
314
Device Close?
316
Interrogate Device
318
Device Respond ?
N
330
Activate Warning
Y
320
Configuration Correct?
N
Y
332
Warning Acknowledged?
N
Y
322
N
Past Device?
Y
A
B

Figure 3a

Figure 3b


A
Speed Reduced Sufficiently
N
B
Y
336
MonitorSpeed
338
Past Device?
Y
N
339
Operator Verified Proper Configuration
N
Y
340
Resume Normal Speed
C
342
B
Stop Train
344
Notify Dispatcher
END

Docket No.: 3805-001-27

Declaration, Power of Attorney and Petition

WE (I) the undersigned inventor(s), hereby declare(s) that:

My residence, post office address and citizenship are as stated below next to my name,

We (I) believe that we are (I am) the original, first, and joint (sole) inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

the specification of which

■ is attached hereto.

☐ was filed on _____

as Application Serial No. _____

and amended on _____

☐ was filed as PCT international application

Number _____

on _____

and was amended under PCT Article 19

on _____ (if applicable).

We (I) hereby state that we (I) have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We (I) acknowledge the duty to disclose information known to be material to the patentability of this application as defined in Section 1.56 of Title 37 Code of Federal Regulations.

We (I) hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed. Prior Foreign Application(s)

Application No.	Country	Day/Month/Year	Priority Claimed
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No

We (I) hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

We (I) hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

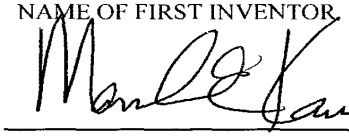
Application Serial No.	Filing Date	Status (pending, patented, abandoned)

And we (I) hereby appoint Steven B. Kelber, Reg. No. 30,073; Jerold I. Schneider, Reg. No. 24,765; Paul C. Kimball, Reg. No. 34,641; Wilburn L. Chesser, Reg. No. 41,668; James M. Heintz, Reg. No. 41,828; Perry E. Van Over, Reg. No. 42, 197; Raymond Millien, Reg. No. 43,806; Lisa K. Norton, Reg. No. 44,977; Patrick R. Delaney, Reg. No. 45,338; and Christopher W. Raimund, Reg. No. 47,258, as our (my) attorneys, with full powers of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith; and we (I) hereby request that all correspondence regarding this application be sent to Supervisor, Patent Prosecution Services, Piper Rudnick LLP, 1200 Nineteenth Street, N.W., Washington, D.C. 20036-2412.

We (I) declare that all statements made herein of our (my) own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Mark Edward KANE

NAME OF FIRST INVENTOR



Signature of Inventor

9/27/02

Date

Residence: 2653 Holly Point Drive
Orange Park, FL 32073

Citizen of: United States

Post Office Address: Same As Above

James Francis SHOCKLEY
NAME OF SECOND JOINT INVENTOR

Signature of Inventor

9/27/02
Date

Residence: 3011 Doctors Lake Drive
Orange Park, FL 32073

Citizen of: United States

Post Office Address: Same As Above

Harrison Thomas HICKENLOOPER
NAME OF THIRD JOINT INVENTOR

Signature of Inventor

9/27/02
Date

Residence: ~~Route 3, Box 1830~~ 179 BUFFALO BLUFF RD
Palatka, FL 32177

Citizen of: United States

Post Office Address: Same As Above

NAME OF FOURTH JOINT INVENTOR

Signature of Inventor

Date

Residence:

Citizen of:

Post Office Address:

NAME OF FIFTH JOINT INVENTOR

Signature of Inventor

Date

Residence:

Citizen of:

Post Office Address:

JC-601

PATENT NUMBER and ISSUE DATE

U.S. UTILITY Patent Application

APPL NUM	FILING DATE	CLASS	SUBCLASS	GAU	EXAMINER
10267959	10/10/2002	701 (105)	270R	3617	MARC - COLEMAN

**APPLICANTS: Kane Mark; Shockley James; Hickenlooper Harrison;

**CONTINUING DATA VERIFIED: None MYM

** FOREIGN APPLICATIONS VERIFIED: None MYM

PG-PUB	DO NOT PUBLISH ☐	RESCIND ☐	
Foreign priority claimed	☐ yes ☒ no		ATTORNEY DOCKET NO
35 USC 119 conditions met	☐ yes ☒ no		3805-001-27
Verified and Acknowledged Examiners's initials	MYM		

TITLE : Method and system for ensuring that a train does not pass an improperly configured device

U.S.DEPT. OF COMM./PAT.& TM-PTO-436L(Rev. 12-94)

NOTICE OF ALLOWANCE MAILED	Assistant Examiner	CLAIMS ALLOWED: Total Claims / Print Claim for O.G
ISSUE FEE: Amount Due / Date Paid		DRAWING: Sheets Drwg. / Figs.Drwg. / Print Fig.
☐ TERMINAL DISCLAIMER	Primary Examiner / PREPARED FOR ISSUE	Application Examiner

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FILED WITH: ☐ DISK (CRF) ☐ CD-ROM (Attached in pocket on right inside flap)

SEARCH

Class	Sub.	Date	Exmr.
701	19	1/15/04	MYM
	301		
246	292		
	182R		
	124		
	284		
	473R		
348	148		
	149		
340	541		
	425.5		
	438		
	439		
701	19	6/17/04	MYM
246	270R		
	167R		
	292		

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.

SEARCH NOTES

(List databases searched. Attach search strategy inside.)

	Date	Exmr.
West Text Search	1/15/04	MYM
West Text Search	6/17/04	MYM

ISSUE SLIP STAPLE AREA (for additional cross-references)

ISSUING CLASSIFICATION			
ORIGINAL		CROSS REFERENCE(S)	
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
INTERNATIONAL CLASSIFICATION			
/			
/			
/			
/			
/			^ Continued on Issue Slip Inside File Jacket

INDEX OF CLAIMS

✓ ..... Rejected - (Through numeral) ... Canceled N ..... Non-elected A ..... Appeal
= ..... Allowed + ... Restricted I ..... Interference O ..... Objected

Claim Final	Claim Original	Date	Claim Final	Claim Original	Date	Claim Final	Claim Original	Date
	1	✓ 1/15/04 6/17/04		51	O 1/15/04 ✓ 6/17/04		101	
	2	✓		52			102	
	3	✓		53			103	
	4	O		54			104	
	5			55			105	
	6			56			106	
	7			57			107	
	8			58	O		108	
	9			59	✓		109	
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	14			64	O		114	
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	19	O		69			119	
	20			70	= ✓		120	
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	44	O		94			144	
	45			95			145	
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	47	✓		97			147	
	48			98			148	
	49	✓		99			149	
	50	O ✓		100			150	

If more than 150 claims or 9 actions staple additional sheet here

11-06-03

#8

10267959_101002

JC973 U.S. PTO 10/267959 10/10/02

10/10/02 JC973 U.S. PTO

UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	3805-001-27
First Inventor or Application Identifier	Mark Edward Kane
Title	METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

1. ■ Fee Transmittal Form (e.g. PTO/SB/17) (Submit an original and a duplicate for fee processing)
   ■ Applicant claims small entity status.
2. ■ Specification — Total Pages: 25
3. ■ Drawing(s) *(35 U.S.C. 113)* — Total Sheets: 4
4. ■ Oath or Declaration — Total Pages: 3
   a. ■ Newly executed (original or copy)
   b. □ Copy from a prior application *(37 C.F.R. §1.63(d))* *(for continuation/divisional with box 16 completed)*
5. □ Incorporation By Reference *(usable if box 4B is checked)* The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4B, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

ACCOMPANYING DOCUMENTS

6. ■ Assignment Papers (cover sheet & document(s))
7. □ 37 C.F.R. §3.73(b) Statement *(when there is an assignee)* □ Power of Attorney
8. □ English Translation Document *(if applicable)*
9. □ Information Disclosure Statement (IDS)/PTO-1449 □ Copies of IDS Citations
10. □ Preliminary Amendment
11. ■ White Advance Serial No. Postcard
12. □ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
13. □ Request for Priority
14. □ List of Inventors' Names and Addresses
15. □ Other:

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below:
□ Continuation □ Divisional □ Continuation-in-part (CIP) of prior application no.:
Prior application information: Examiner: Group Art Unit:

17. Amend the specification by inserting before the first line the sentence:
□ This application is a □ Continuation □ Division □ Continuation-in-part (CIP) of application Serial No. Filed on
□ This application claims priority of provisional application Serial No. Filed

18. CORRESPONDENCE ADDRESS

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Street, N.W.
Washington, D.C. 20036-2412
Telephone No. (202) 861-3900
Facsimile No. (202) 223-2085

Name	Steven B. Kelber	Registration No.	30,073		
Signature		Date	October 10, 2002	Telephone	202-861-3900
Name	James M. Heintz	Registration No.	41,828		

10267959_101002

FEE TRANSMITTAL

Docket No.	3805-001-27
Serial No.	New Application
Filing Date	Herewith
Inventor(s)	Mark Edward KANE, et al.
Group Art Unit	
Examiner	

TOTAL AMOUNT OF PAYMENT $986.00

1. ■ Applicant claims small entity status.

□ Charge any **UNDERPAYMENT** or credit any **OVERPAYMENT** in the indicated fees to Deposit Account No. 50-1442.

□ Charge the indicated fees to Deposit Account No. 50-1442.

2. ■ Check enclosed.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	740	2001	370	Utility filing fee	370.00
1002	330	2002	165	Design filing fee	
1003	510	2003	255	Plant filing fee	
1004	740	2004	370	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
				SUBTOTAL (1)	$370.00

2. EXTRA CLAIM FEES

tot. claims	70	-	20*	=	50	x	$9	=	450
ind. claims	6	-	3*	=	3	x	$42	=	126
□	Multiple Dependent Claims						$140	=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	84	2201	42	Independent claims in excess of 3
1203	280	2203	140	Multiple dependent claim, if not paid
1204	84	2204	42	*Reissue independent claims over original patent
1205	18	2205	9	*Reissue claims in excess of 20 and over original patent
				SUBTOTAL (2) $576.00

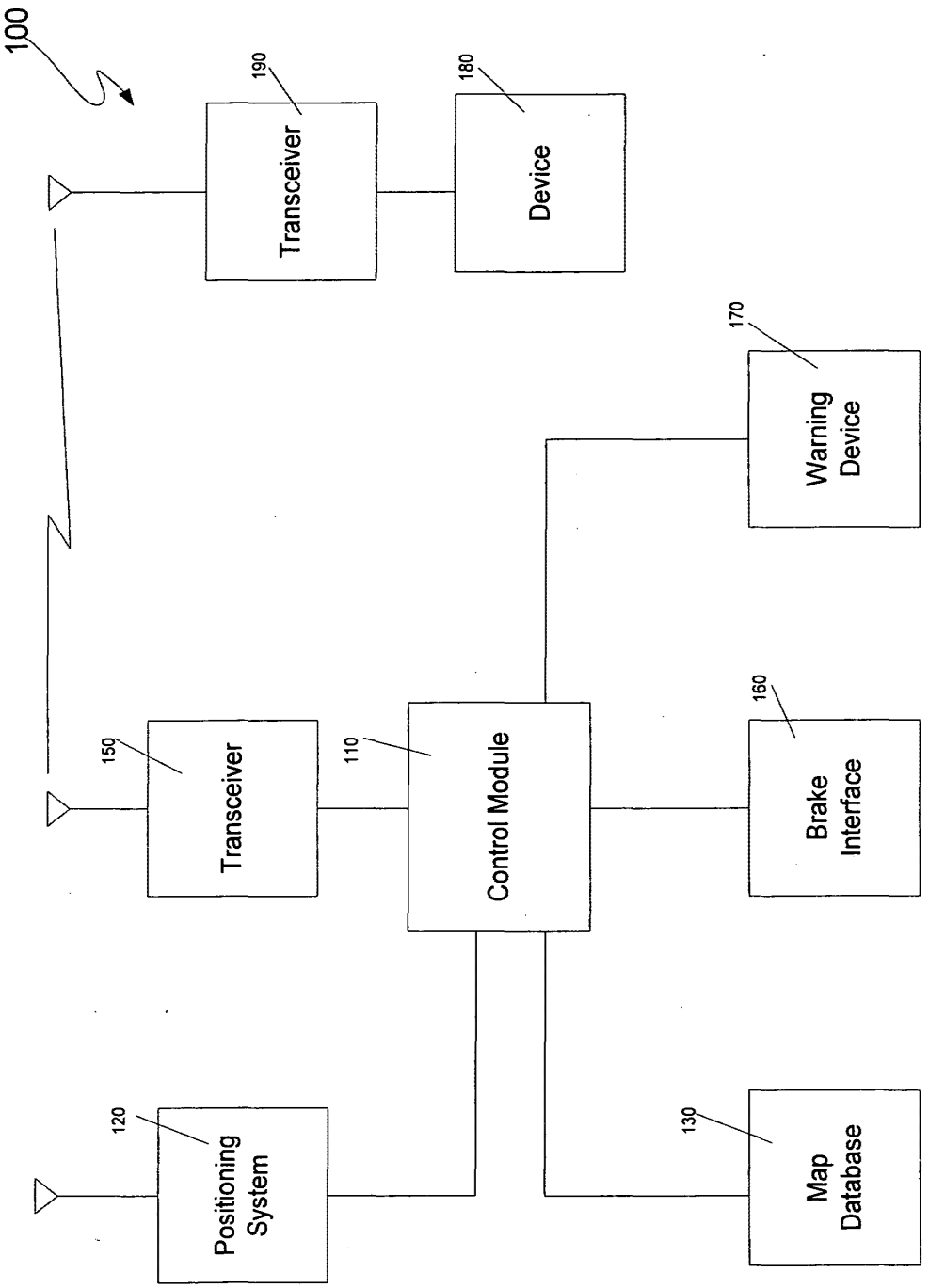
* or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge-late filing fee or oath	
1052	50	2052	25	Surcharge-late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2520	1812	2520	Ex parte reexam. fee	
1251	110	2251	55	1-mo. ext. of time	
1252	400	2252	200	2-mo. ext. of time	
1253	920	2253	460	3-mo. ext. of time	
1254	1440	2254	720	4-mo. ext. of time	
1255	1960	2255	980	5-mo. ext. of time	
1401	320	2401	160	Notice of Appeal	
1402	320	2402	160	Appeal Brief	
1403	280	2403	140	Request for Oral Hearing	
1501	1280	2501	640	Utility/Reissue Issue Fee	
1502	460	2502	230	Design Issue Fee	
1503	620	2503	310	Plant Issue Fee	
1460	130	1460	130	Petitions to the Commissioner	
1806	180	1806	180	IDS Submission	
8021	40	8021	40	Assignment	40.00
1801	740	2801	370	For Filing RCE	
1802	900	1802	900	Expedited Design	
OTHER (indicate below):					
				SUBTOTAL (3)	$40.00

Name	Steven B. Kelber	Registration No.	30,073		
Signature		Date	October 10, 2002	Telephone	202-861-3900
Name	James M. Heintz	Registration No.	41,828		


100
190
Transceiver
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Device
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110
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160
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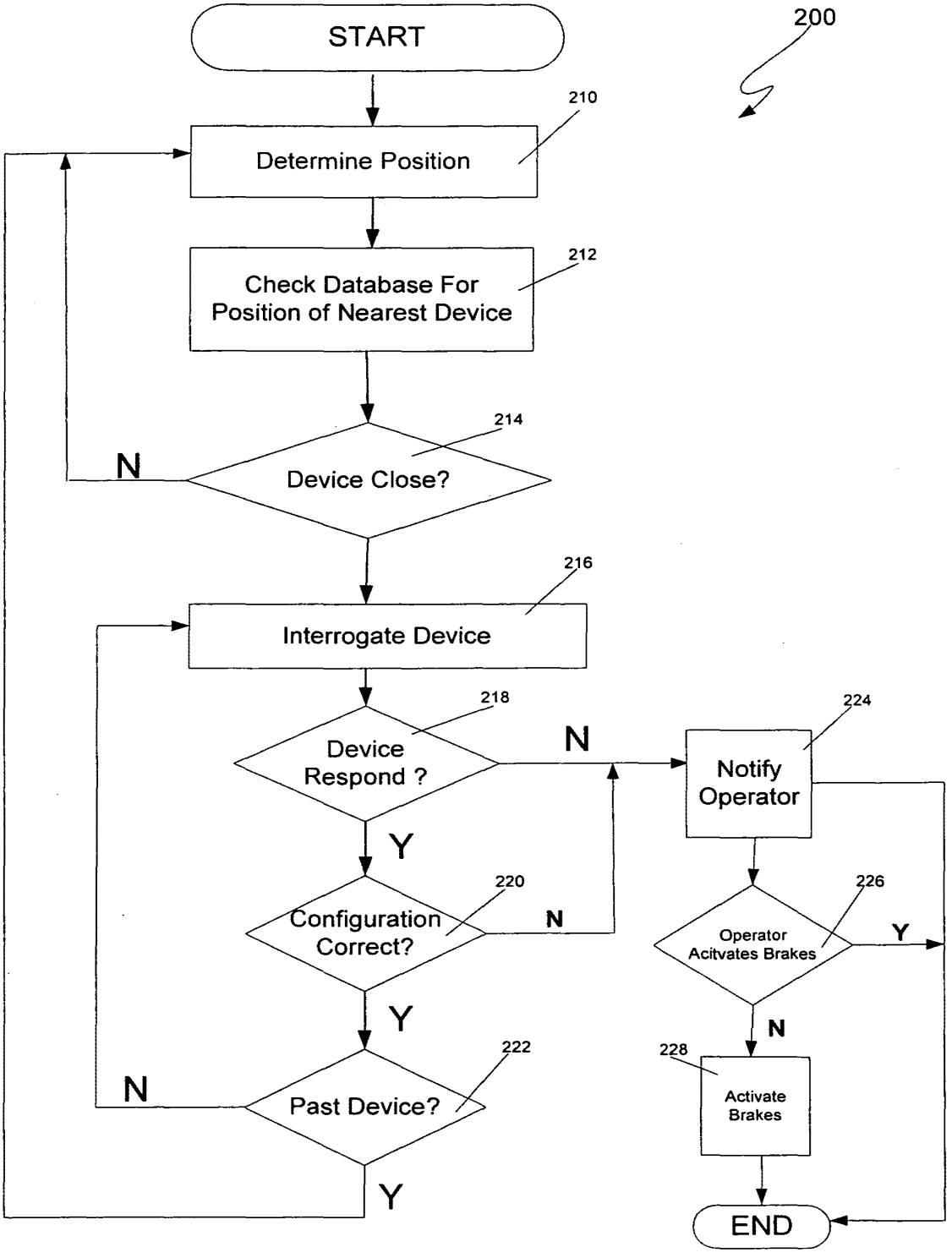
120
Positioning System
130
Map Database

Figure 1


START
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Determine Position
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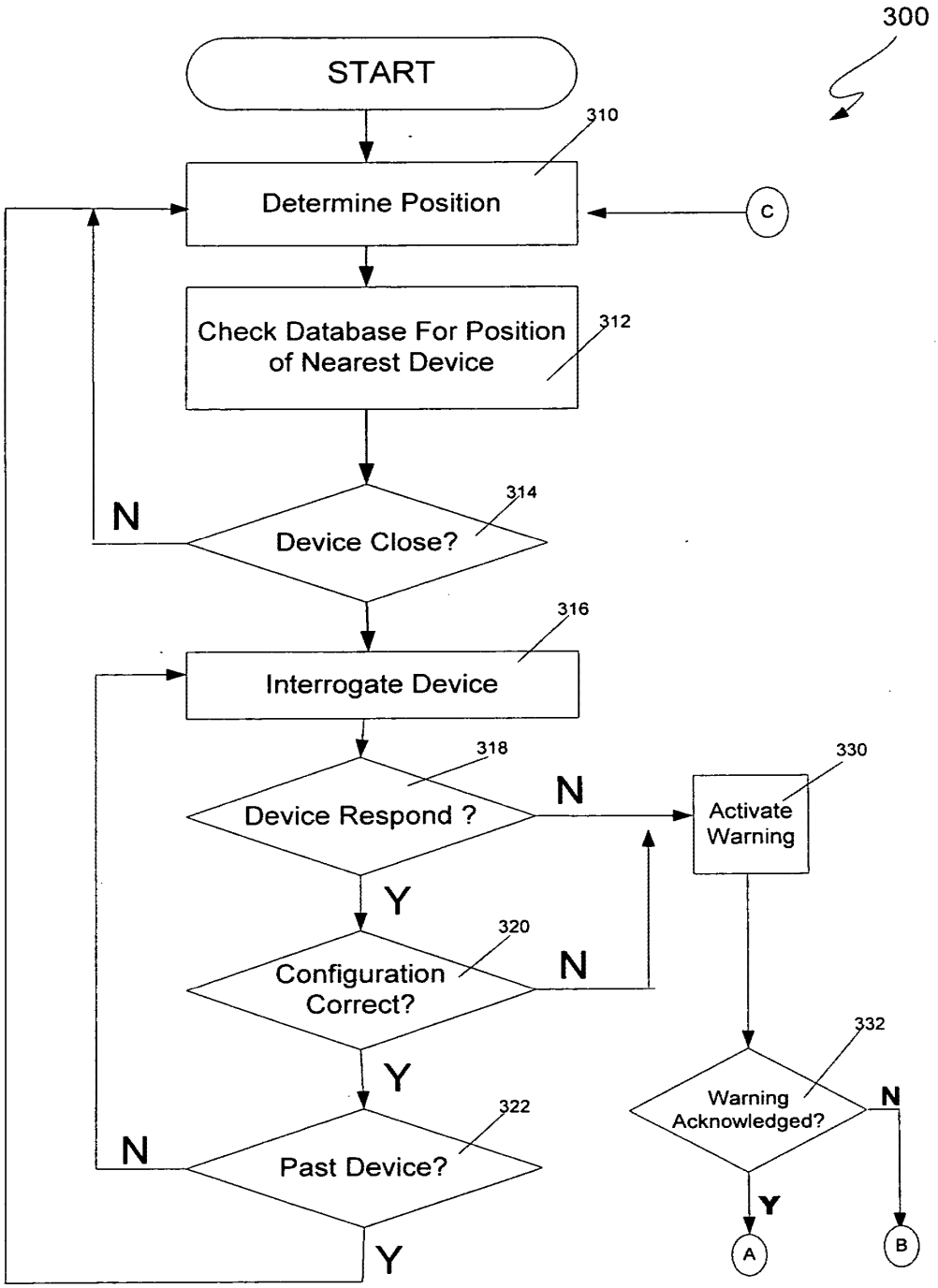
Device Close?
N
216
Interrogate Device
218
Device Respond ?
N
224
Notify Operator
Y
220
Configuration Correct?
N
226
Operator Acitvates Brakes
Y
Y
N
222
Past Device?
228
Activate Brakes
N
Y
END

Figure 2


300
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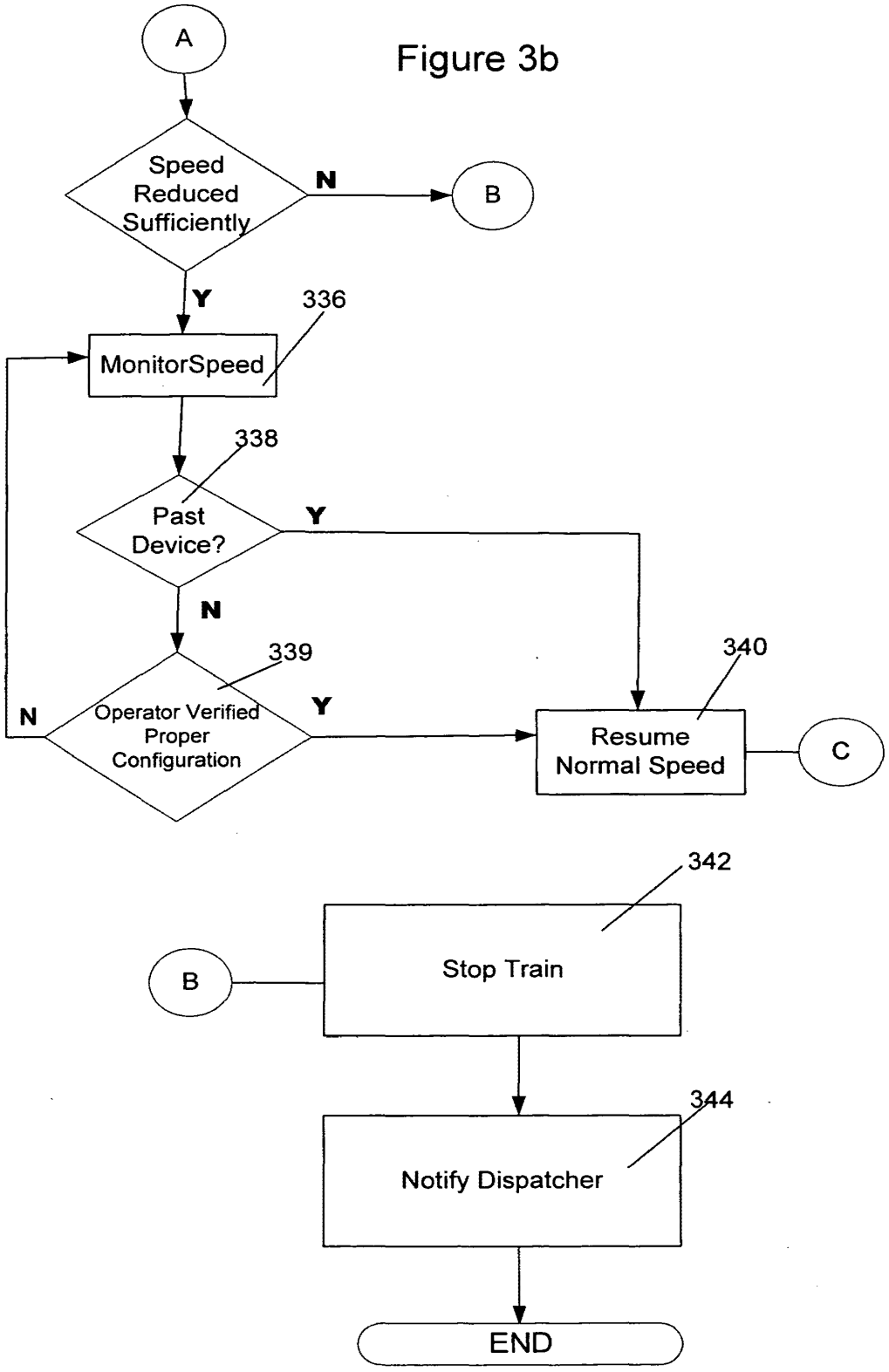
314
Device Close?
316
Interrogate Device
318
Device Respond ?
N
330
Activate Warning
Y
320
Configuration Correct?
N
Y
332
Warning Acknowledged?
N
322
N
Past Device?
Y
Y
A
B

Figure 3a

Figure 3b


A
Speed Reduced Sufficiently
N
B
Y
336
MonitorSpeed
338
Past Device?
Y
N
339
Operator Verified Proper Configuration
N
Y
340
Resume Normal Speed
C
342
B
Stop Train
344
Notify Dispatcher
END

DOCKET NO: 3805-001-27

TITLE OF THE INVENTION

METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates to railroads generally, and more particularly to a method and system for ensuring that a train does not pass a device such as a grade crossing gate or a track switch when that device is not properly configured.

Discussion of the Background

Train safety has always been a concern in the railroad industry. If anything, this concern has increased in recent years. This concern has led to proposals for and development of automated, safety-enhancing systems such as Automatic Train Control (ATC), Positive Train Control (PTC), and others. While such systems vary in their implementation, one goal they all share is to avoid accidents.

One source of accidents is an improperly set switch. Historically, an engineer or conductor would visually verify that a switch has been set to the correct position. However, engineers and conductors, being human, sometimes make mistakes, including traveling too fast such that there is not sufficient time to stop the train when the signal is first visible, not activating the brakes a sufficient distance from the switch, failing to notice that the switch has been improperly set, and even forgetting to look at the switch. The results of such mistakes can be disastrous.

Another source of accidents is a malfunctioning grade crossing gate. Grade crossing gates may be triggered by radar, by a track circuit, or by a mechanical switch set at a position far enough away from the crossing gate such that the gate will have sufficient time to go down when triggered by a train traveling at the maximum allowable speed. Some gates are equipped with monitoring equipment that can determine if the gate is malfunctioning and, in some cases, sends a message via telephone or radio informing the dispatcher of a malfunction. The dispatcher is then required to broadcast this information to all other trains that pass the grade crossing.

What is needed is a method and apparatus that ensures that a train will not pass a switch, grade crossing gate, or other device that is not properly configured.

SUMMARY OF THE INVENTION

The present invention meets the aforementioned need to a great extent by providing a computerized train control system in which a control module determines a position of a train using a positioning system such as a global positioning system (GPS), consults a database to determine when the train is approaching a configurable device such as a switch or grade crossing gate, continuously interrogates the device to determine its status as the train approaches the device, and forces an engineer/conductor to acknowledge any detected malfunction. A malfunction can be reported by the device itself, or can be declared by the system if the device fails to respond to initial or subsequent interrogations. In some embodiments of the invention, the train is forced to come to a complete stop before proceeding past the device. In other embodiments, the train will slow

to a speed that will allow the engineer/conductor to visually determine whether it is safe to proceed past the device if the engineer/conductor acknowledges a message warning of the malfunction and will stop the train if the engineer/conductor fails to acknowledge the warning message.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the invention and many of the attendant features and advantages thereof will be readily obtained as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

Figure 1 is a logical block diagram of a train control system according to one embodiment of the invention.

Figure 2 is a flow chart of a device interrogation method according to another embodiment of the invention.

Figures 3a and 3b are a flow chart of a device interrogation method according to a third embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will be discussed with reference to preferred embodiments of train control systems. Specific details, such as specific algorithms and hardware, are set forth in order to provide a thorough understanding of the present invention. The preferred embodiments discussed herein should not be understood to limit the invention. Furthermore, for ease of understanding, certain

method steps are delineated as separate steps; however, these steps should not be construed as necessarily distinct nor order dependent in their performance.

Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, Figure 1 is a logical block diagram of a train control system 100 according to an embodiment of the present invention. The system 100 includes a control module 110, which typically, but not necessarily, includes a microprocessor. The control module 110 is responsible for controlling the other components of the system.

A positioning system 120 is connected to the control module 110. The positioning system supplies the position (and, in some cases, the speed) of the train to the control module 110. The positioning can be of any type, including a global positioning system (GPS), a differential GPS, an inertial navigation system (INS), or a Loran system. Such positioning systems are well known in the art and will not be discussed in further detail herein. (As used herein, the term "positioning system" refers to the portion of a positioning system that is commonly located on a mobile vehicle, which may or may not comprise the entire system. Thus, for example, in connection with a global positioning system, the term "positioning system" as used herein refers to a GPS receiver and does not include the satellites that transmit information to the GPS receiver.)

A map database 130 is also connected to the control module 110. The map database 130 preferably comprises a non-volatile memory such as a hard disk, flash memory, CD-ROM or other storage device, on which map data is stored. Other types of memory, including volatile memory, may also be used. The map data preferably includes positions of all configurable devices such as switches and grade

crossing gates. The map data preferably also includes information concerning the direction and grade of the track in the railway. By using train position information obtained from the positioning system 120 as an index into the map database 140, the control module 110 can determine its position relative to configurable devices.

When the control module 110 determines that a configurable device 180 (which includes a transceiver 190) is present, it interrogates the device 180 through transceiver 150. The transceiver 150 can be configured for any type of communication, including communicating through rails and wireless. In addition to communicating with configurable devices 180, the transceiver 150 may communicate with a dispatcher (not shown in Figure 1).

Also connected to the control module 110 is a brake interface 160. The brake interface 160 monitors the train brakes and allows the control module 110 to activate and control the brakes to stop or slow the train when necessary.

A warning device 170 is also connected to the control module 110. The warning device 170 is used to warn the conductor/engineer that a malfunction has been detected. The warning device 170 may also be used to allow the engineer/ conductor to acknowledge the warning. In some embodiments, the warning device 170 is in the form of button on an operator display such as the display illustrated in co-pending U.S. application serial number 10/186,426, entitled "Train Control System and Method of Controlling a Train or Trains" filed July 2, 2002, the contents of which are hereby incorporated by reference herein. In other embodiments, the warning device 170 may be a stand alone button that illuminates when a malfunction is detected. In yet other embodiments (e.g., those in which no

acknowledgment of a warning is required), the warning device 170 may comprise or consist of a horn or other device capable of providing an audible warning.

Figure 2 is a flowchart 200 illustrating operation of the processor 110 in connection with configurable devices 180. The control module 110 determines the train's current position from information provided by the positioning system 120 at step 210. The control module then obtains the locations of nearby configurable devices 180 from the map database 130 at step 212. If no configurable device 180 is withing a threshold distance, steps 210 et seq. are repeated. If a configurable device 180 is within a threshold distance at step 214, the device is interrogated at step 216.

In some embodiments, this threshold distance is predetermined distance based in part upon a worst case assumption (i.e., an assumption that a train having the greatest possible weight is traveling at a maximum allowable or possible speed in a downhill direction on a portion of track with the steepest grade in the system). In other embodiments, the threshold is based on the actual speed and weight of the train and the grade of the track between the train and the device. In still other embodiments, the calculation may take into account the distribution of weight in the train this will effect the required stopping distance as discussed in the aforementioned co-pending U.S. patent application.

In some embodiments, the interrogation includes an identification number associated with the device 180. Since only the device corresponding to the identification number will respond to the interrogation, this identification number is obtained from the map database 130. This avoids contention between multiple devices attempting to respond to the interrogation on the same frequency.

If the configurable device 180 fails to respond at step 218, or reports an incorrect configuration at step 220, the control module notifies the conductor/engineer of the malfunction at step 224. If, in response to the notification, the operator fails to activate the brakes at step 226, the control module 110 automatically activates the brakes to bring the train to a halt at step 228. At this point, the conductor/engineer must restart the train, which preferably requires the conductor/engineer to acknowledge the warning provided at step 224.

If the device 180 responds to the interrogation at step 218 and reports a correct configuration at step 220, then, at step 222, the control module 110 returns to step 216 if the device 180 has not been passed, or returns to step 210 to repeat the process for the next configurable device 180. Returning to step 216 to interrogate the device multiple times as the train approaches the device is important for safety purposes. This will detect malfunctions or changes in configuration after the initial interrogation (e.g., someone throwing the switch into the wrong position after the initial interrogation but before the train reaches the switch) from causing and accident. Whether or not the interrogation of step 318 includes the device's identification number, it is preferable for the device's response to include its identification number as this allows for greater assurance that a response from some other source has not been mistaken as a response from the device.

Figures 3a and 3b together form a flowchart 300 illustrating operation of the control unit 110 in connection with configurable devices 180 according to a second embodiment of the invention. Steps 310-322 of the flowchart 300 are similar to steps 210-222 of the flowchart 200 of Figure 2; therefore, the detailed discussion of these steps will not be repeated. If a configurable device 180 does

not respond at step 318 or reports an incorrect configuration at step 320 after being interrogated at step 316, the control module 110 then activates the warning device 170 to inform the conductor/engineer of the problem at step 330. A time period within which the operator must acknowledge the warning and slow the train to a reduced speed is associated with the warning. This time period may be a predetermined number based on a worst-case stopping distance, or may be calculated dynamically based on factors such as the current speed of the train, the braking characteristics of the brakes on the train, the weight of the train, the distribution of weight on the train, and/or the grade of the track as determined from the map database 130 using the train position from the positioning system 120, or other factors as discussed in the above-referenced co-pending U.S. patent application.

If the operator acknowledges the warning at step 332 and sufficiently slowed the train at step 334 within the allowable time period, the control module 110 monitors the speed of the train to ensure that the reduced speed is maintained at step 336 until either the train has passed the device 180 at step 338 or the conductor/engineer verifies that he has visually determined that the device is configured properly at step 340. In the case of a configurable device such as a grade crossing gate, this allows the train to continue moving past the gate at a slow speed. In the case of an incorrectly thrown switch, it is expected that the conductor/engineer will stop the train if the switch cannot be set to the correct position before the train reaches it; however, there may be some circumstances in which the conductor/engineer desires to allow the train to continue past an incorrectly thrown switch. Because the conductor/engineer was forced to

acknowledge the warning about the improperly configured switch, it is unlikely that allowing the train to proceed past the improperly configured switch is not intentional. In other embodiments, a train may not be allowed to pass the switch until it has come to a complete stop, but may be allowed to pass an improperly configured grade crossing gate at a reduced speed without first coming to a complete stop.

If the conductor/engineer fails to acknowledge the warning at step 334 within the allowed time period, the control module 110 commands the brake interface to stop the train at step 342. The control module 110 then notifies the dispatcher of the stopped train at step 344.

At steps 220 and 320 above, the control module 110 determines whether the device 180 is properly configured. This determination is necessarily device dependent. For example, in the case of a switch, the determination as to whether the device is configured correctly is preferably made with respect to warrants/authorities and/or route information issued to the train. That is, the control module 110 preferably stores information as to what route the train is to take and what warrants (also sometimes referred to as authorities) have been issued for that train. In the case of a grade crossing gate, determining that the device is configured properly comprises more than determining that the gate is in the down position. Many such devices are designed such that a failure results in the gate being placed in the down position. However, in the event of such a failure, it can be expected that some cars and/or pedestrians may attempt to cross the tracks even though the gate is down. Thus, if the crossing gate reports a malfunction, it is

preferably treated as if it is not properly configured despite the fact that the gates may be reported as being in the down position.

It should be understood that any and all of the aforementioned events (e.g., the acknowledgment or lack thereof of a warning from an engineer/conductor, the stopping of the train upon a detection of an improperly configured device) may be recorded by the event recorder 140. It should also be understood that, in some embodiments, some configurable devices 180 may be configured by sending commands from the train. In such embodiments, the control module 110 will send the appropriate command via the transceiver 150 on the train to the device 180 via its transceiver 190.

One advantage of those embodiments of the invention in which a configurable device is interrogated as the train approaches is that such devices are not required to transmit information when trains are not in the area. This saves power as compared to those systems in which wayside devices continuously or periodically transmit information regardless of whether a train is close enough to receive such information.

In the embodiments discussed above, the control module 110 is located on the train. It should also be noted that some or all of the functions performed by the control module 110 could be performed by a remotely located processing unit such as processing unit located at a central dispatcher. In such embodiments, information from devices on the train (e.g., the brake interface 160) is communicated to the remotely located processing unit via the transceiver 150.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

WHAT IS CLAIMED IS:

1. A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise.

2. The system of Claim 1, wherein the device is a grade crossing gate.

3. The system of Claim 1, wherein the device is a switch.

4. The system of Claim 1, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

5. The system of Claim 1, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

6. The system of Claim 1, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

7. The system of Claim 6, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

8. The system of Claim 7, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

9. The system of Claim 7, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

10. The system of Claim 9, wherein the threshold is further based on a weight of the train.

11. The system of Claim 9, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

12. The system of Claim 11, wherein the threshold is further based on distribution of weight in the train.

13. The system of Claim 1, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

14. The system of Claim 13, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

15. A method for controlling a train comprising the steps of:

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

16. The method of Claim 15, wherein the device is a grade crossing gate.

17. The method of Claim 15, wherein the device is a switch.

18. The method of Claim 16, further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information.

19. The method of Claim 15, wherein the response includes an identification number of the device and the method further comprises the step of

confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

20. The method of Claim 15, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

21. The method of Claim 15, further comprising the steps of:

identifying a configurable device in a database which is a next device which the train will pass based on information from a positioning system located on the train; and

obtaining an identification number associated with the device identified in the identifying step from the database.

22. The method of Claim 21, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

23. The method of Claim 22, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

24. The method of Claim 22, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

25. The method of Claim 24, wherein the threshold is further based on a weight of the train.

26. The method of Claim 24, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

27. The method of Claim 26, wherein the threshold is further based on distribution of weight in the train.

28. The method of Claim 15, further comprising the step of activating a warning device when a response with a correct configuration is not received.

29. The method of Claim 28, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

30. A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

31. The system of Claim 30, wherein the device is a grade crossing gate.

32. The system of Claim 30, wherein the device is a switch.

33. The system of Claim 30, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

34. The system of Claim 30, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

35. The system of Claim 30, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

36. The system of Claim 35, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

37. The system of Claim 35, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

38. The system of Claim 35, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

39. The system of Claim 38, wherein the threshold is further based on a weight of the train.

40. The system of Claim 38, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

41. The system of Claim 40, wherein the threshold is further based on distribution of weight in the train.

42. The system of Claim 30, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

43. The system of Claim 42, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

44. The system of Claim 30, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

45. The system of Claim 30, further comprising a positioning system in communication with the control unit and located on the train, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train. track.

46. The system of Claim 45, further comprising a track database in communication with the control unit, wherein the period of time is further based on a grade of a section of track between the train and the device.

47. A method for controlling a train comprising the steps of:

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if a response with a correct configuration is not received or if no response is received,

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

48. The method of Claim 47, wherein the device is a grade crossing gate.

49. The method of Claim 47, wherein the device is a switch.

50. The method of Claim 47, wherein the response includes an identification number of the device and further comprising the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

51. The method of Claim 47, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

52. The method of Claim 47, further comprising the steps of:

identifying a configurable device in the database which is a next device which the train will pass based on information from a positioning system; and

obtaining an identification number associated with the device identified in the identifying step from a database.

53. The method of Claim 52, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

54. The method of Claim 52, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

55. The method of Claim 52, further comprising the step of calculating the threshold based at least in part upon the current speed of the train.

56. The method of Claim 55, wherein the threshold is further based on a weight of the train.

57. The method of Claim 55, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

58. The method of Claim 57, wherein the threshold is further based on distribution of weight in the train.

59. The method of Claim 47, further comprising the step of activating a warning device when a response with a correct configuration is not received.

60. The method of Claim 59, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

61. The method of Claim 47, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

62. The method of Claim 47, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train.

63. The method of Claim 62, wherein the period of time is further based on a grade of a section of track between the train and the device.

64. The method of Claim 63, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a

memory and determining whether a configuration received from the switch is correct by comparing a direction of the switch to a desired direction of the switch based on the route information.

65. A method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

stopping the train if a response from the device indicates that the device is not properly configured or if a response is not received within the period of time.

66. The method of Claim 65, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

67. The method of Claim 65, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

68. A computerized method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a first period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the first period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

providing a warning to an operator if a response from the device indicates that the device is not properly configured or if a response is not received within the first period of time;

stopping the train if the operator does not acknowledge the warning and slow the train to a reduced speed within a second period of time; and

if the warning is acknowledged and the reduced speed is achieved within the second period of time, maintaining the reduced speed until the operator verifies that the device is configured properly or until the train has passed the device;

69. The method of Claim 68, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

70. The method of Claim 68, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a

memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

ABSTRACT

A train control system includes a positioning system and consults a database to determine when the train is approaching a configurable device such as a switch or grade crossing gate. The system continuously interrogates the device to determine its status as the train approaches the device, and forces an engineer/conductor to acknowledge any detected malfunction. The train is forced to come to a complete stop before proceeding past the device or may be slowed down to a speed that will allow the engineer/conductor to visually determine whether it is safe to proceed past the device if the engineer/conductor acknowledges a message warning of the malfunction and will stop the train if the engineer/conductor fails to acknowledge the warning message.

Docket No.: 3805-001-27

Declaration, Power of Attorney and Petition

WE (I) the undersigned inventor(s), hereby declare(s) that:

My residence, post office address and citizenship are as stated below next to my name,

We (I) believe that we are (I am) the original, first, and joint (sole) inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

the specification of which

■ is attached hereto.

☐ was filed on _____

as Application Serial No. _____

and amended on _____

☐ was filed as PCT international application

Number _____

on _____

and was amended under PCT Article 19

on _____ (if applicable).

We (I) hereby state that we (I) have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We (I) acknowledge the duty to disclose information known to be material to the patentability of this application as defined in Section 1.56 of Title 37 Code of Federal Regulations.

We (I) hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed. Prior Foreign Application(s)

Application No.	Country	Day/Month/Year	Priority Claimed
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No
_____	_____	_____	☐ Yes ☐ No

We (I) hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

We (I) hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

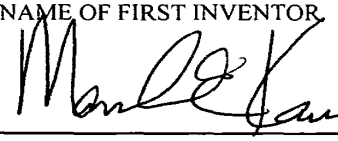
Application Serial No.	Filing Date	Status (pending, patented, abandoned)

And we (I) hereby appoint Steven B. Kelber, Reg. No. 30,073; Jerold I. Schneider, Reg. No. 24,765; Paul C. Kimball, Reg. No. 34,641; Wilburn L. Chesser, Reg. No. 41,668; James M. Heintz, Reg. No. 41,828; Perry E. Van Over, Reg. No. 42, 197; Raymond Millien, Reg. No. 43,806; Lisa K. Norton, Reg. No. 44,977; Patrick R. Delaney, Reg. No. 45,338; and Christopher W. Raimund, Reg. No. 47,258, as our (my) attorneys, with full powers of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith; and we (I) hereby request that all correspondence regarding this application be sent to Supervisor, Patent Prosecution Services, Piper Rudnick LLP, 1200 Nineteenth Street, N.W., Washington, D.C. 20036-2412.

We (I) declare that all statements made herein of our (my) own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Mark Edward KANE

NAME OF FIRST INVENTOR



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Date

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Residence:

Signature of Inventor

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Signature of Inventor

Citizen of:

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Date

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1-13-09

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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01 FC:201	370.00 OP
02 FC:202	126.00 OP
03 FC:203	450.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-267/69033

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2001

Application or Docket Number: 10267959

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	70	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	70 minus 20=	* 50
INDEPENDENT CLAIMS	6 minus 3 =	* 3
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	370.00	OR	BASIC FEE	740.00
X$ 9=	450	OR	X$18=	
X42=	126	OR	X84=	
+140=		OR	+280=	
TOTAL	946	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X42=		OR	X84=	
+140=		OR	+280=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

PIPER RUDNICK LLP
1200 NINETEENTH STREET, NW
WASHINGTON, DC 20036-2412
TELEPHONE: 202-861-3900
FACSIMILE: 202-223-2085

DOCKET NO.: 3805-001-27

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

Re:	Serial No.:	10/267,959
	Applicant(s):	Mark Edward KANE, et al.
	Filing Date:	October 10, 2002
	For:	METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
	Group Art Unit:	3617
	Examiner:	

SIR:

Attached hereto for filing are the following papers:

Information Disclosure Statement
PTO Form 1449
List of Related Cases
Cited documents (100)

Our check in the amount of $0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

PIPER RUDNICK LLP

Steven B. Kelber
Attorney of Record
Registration No.: 30,073

James M. Heintz
Registration No.: 41,828

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION: Mark Edward KANE, et al. GROUP ART UNIT: 3617

SERIAL NUMBER: 10/267,959 EXAMINER:

FILED: October 10, 2002

FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. 1.97

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants wish to disclose the following information.

REFERENCES

■ Applicants wish to make of record the documents listed on the attached Form PTO-1449. Copies of the listed documents are attached, where required, as are either statements of relevancy or any readily available full or partial English translations of any non-English-language documents.

RELATED CASES

■ Attached is a list of Applicants' pending applications and issued patents which may be related to the present application. Copies of the documents, where required, are attached along with Form PTO-1449.

CERTIFICATION

The undersigned certifies that

□ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application for the first time (to the knowledge of the undersigned, having made reasonable inquiry) not more than three months prior to the filing of this statement.

□ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement.

BASIS FOR CONSIDERATION

This Information Disclosure Statement is filed:

□ without fee and within three months of the filing date of the application.
□ without fee and within three months of the date of entry of the U.S. national stage.
■ without fee and before the mailing date of a first Office Action on the merits (to the knowledge of the undersigned).
□ without fee and with the appropriate certification above.
□ without fee and with a new CPA application.
□ without fee and with a Request for Continued Examination.
□ with fee and before the mailing date of any of a Final Office Action, Notice of Allowance or an action that otherwise closes prosecution (to the knowledge of the undersigned).
□ with fee, appropriate certification above, and before payment of the Issue Fee.

DEPOSIT ACCOUNT

■ Please charge any additional fees for the papers being filed herewith and for which no check is enclosed herewith, or credit any overpayment to Deposit Account No. 50-1442.

Respectfully submitted,

PIPER RUDNICK LLP

Steven B. Kelber
Attorney of Record
Registration No. 30,073
James M. Heintz

1200 Nineteenth Street, N.W.
Washington, DC 20036-2412
Telephone No. (202) 861-3900

Refine Search

Search Results -

Term	Documents
TRAIN	282261
TRAINS	75454
LOCOMOTIVE	27009
LOCOMOTIVES	11532
(30 AND (LOCOMOTIVE OR TRAIN)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	91
((TRAIN OR LOCOMOTIVE) AND L30).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	91

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L31

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Wednesday, January 14, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
	DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L31	(train or locomotive) and l30	91	L31
L30	(identi$9 OR determin$3 or verif$4) same (grade crossing gate or crossing gate)	171	L30
L29	identi$9 near1 number near3 (grade crossing gate or crossing gate)	0	L29
L28	l26 and database	5	L28
L27	l22 and (stop$4 or brak$3)	0	L27

h e b b cg b e e ch

L26	identi$9 same (grade crossing gate or crossing gate)	85	L26
L25	distance and l22	1	L25
L24	l22 and (chang$3 or switch$3 or activat$3) and L23	1	L24
L23	switch$ and L22	1	L23
L22	6609049.pn.	3	L22
L21	(id or identi$9) same (switch$2 or grade crossing) and l19	32	L21
L20	(id or idnenti$9) same (switch$2 or grade crossing) and l19	13	L20
L19	l18 and switch$3	91	L19
L18	receiv$3 and L17	124	L18
L17	l15 and transmi$4	140	L17
L16	transceiver and L15	22	L16
L15	control$ and L14	326	L15
L14	(train or locomotive) and L13	460	L14
L13	grade crossing	744	L13
L12	(receiv$3 or obtain$3) near5 (train or railway vehicle or rail vehicle or locomotive)	23041	L12
L11	(grade crossing gate or crossing gate) and L8	36	L11
L10	(grade crossing gate) and L8	3	L10
L9	(grade creossing gate) and L8	0	L9
L8	L4 and L5 and L7	389	L8
L7	(receiv$3 or obtain$3) same (train or railway vehicle or rail vehicle or locomotive)	110940	L7
L6	(receiv$3 or obtain$) same (train or railway vehicle or rail vehicle or locomotive)	111465	L6
L5	(transceiver or transmi$5) same (train or railway vehicle or rail vehicle or locomotive)	85655	L5
L4	(determin$3 or control$4) same (position or location) same (train or railway vehicle or rail vehicle or locomotive) same (track switch or grade cross$3 gate or crossing near1 gate)	1048	L4
L3	(receiv$3 or obtain$3) near5 (train or railway vehicle or rail vehicle or locomotive)	23041	L3
L2	(receiv$3 or obtain$3) near5 (train or railway vehicle or rail vehicle or locomotive)	23041	L2
L1	(receiv$3 or obtain$3) same (train or railway vehicle or rail vehicle or locomotive)	110940	L1

END OF SEARCH HISTORY

h e b b cg b e e ch

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 01/22/2004

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
MARC COLEMAN, MARTHE Y	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 01/22/2004

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

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Marthe Y Marc-Coleman	3661	

-- 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 MONTH(S) 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 the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- 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 *10 October 2002*.

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

3)☐ 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

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *65-70* is/are allowed.

6)☒ Claim(s) *1-3,13-18,28-32,42,43,47-49,59 and 60* is/are rejected.

7)☒ Claim(s) *4-12,19-27,33-41,44-46,50-58 and 61-64* is/are objected to.

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

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

a)☐ All b)☐ Some * c)☐ None of:

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.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This office action is in response to application serial No. 10/267,959 filed on 10/10/02 in which claims 1-70 are presented for examination.

Claim Objections

2. Claim 45 is objected to because of the following informalities: claim 45, line 4, "track." should be deleted after "train". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. 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 –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-3, 13-18, 28-32, 42, 43, 47-49, 59, and 60 are rejected under 35 U.S.C. 102(e) as being anticipated by Kane et al. (U.S. Patent No. 6,609,049).

In regard to claims 1 and 15, Kane et al. discloses a system for controlling a train comprising:

- a control unit ***(110 in Fig. 1)***; and
- a transceiver ***(140 in Fig. 1)*** located on the train and communicating with the control unit (see Fig. 1);

wherein the control unit comprising:

- transmitting an interrogation message to a configurable device near the train (see col. 2 lines 22-col. 3 line 12);
- listening for a response from the configurable device, the response including a configuration of the configurable device (see col. 2 line 22-col. 3 line 12);
- allowing the train to continue if a response with a correct configuration is received within a period of time (see col. 2 line 22-col. 3 line 12); and
- stopping the train otherwise (see col. 2 line 22-col. 3 line 12).

In regard to claims 30 and 47, Kane et al. discloses a system and method for controlling a train comprising:

- a control unit ***(110 in Fig. 1)***; and
- a transceiver ***(140 in Fig. 1)*** located on the train and communicating with the control unit (see Fig. 1);

wherein the control unit comprising:

- transmitting an interrogation message to a configurable device near the train (see col. 2 lines 22-col. 3 line 12);

- listening for a response from the configurable device, the response including a configuration of the configurable device (see col. 2 line 22-col. 3 line 12);
- allowing the train to continue if a response with a correct configuration is received within a period of time (see col. 2 line 22-col. 3 line 12); and
- listening for a response form the configuration device, the response including a configuration of the configurable device (see col. 2 line 22-col. 3 line 12 and Fig. 2);
- allowing the train to continue if a response with a correct configuration is received (see col. 2 line 22-col. 3 line 12 and Fig. 2);
- if no response is received or if a response with an incorrect configuration is received, activating a warning device to provide a warning to a train operator (see col. 2 line 22-col. 3 line 12 and Fig. 2);
- stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time (see col. 2 line 22-col. 3 line 12 and Fig. 2); and
- if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received (see col. 2 line 22-col. 3 line 12 and Fig. 2).

In regard to claims 2, 3, 16, 17, 31, 32, 48 and 49, Kane et al. discloses that the device is a grade crossing gate (see col. 2 lines 36-44). Kane also disclose that the device is a switch (see col. 2 lines 36-44).

In regard to claims 13, 28, 42, and 59, Kane et al. discloses that the system further comprising a warning device ***(140 in Fig. 1)*** connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is received (see Fig. 1 and col. 2 line 22 –col. 3 line 12).

In regard to claims 14, 29, 43 and 60, Kane et al. discloses that the control unit is further configured to performed the step of preventing the train from moving until an acknowledgment of the activated warning device has been received (see Fig. 2).

In regard to claim 18, Kane et al. discloses storing route information form a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information (see Fig. 1 and col. 2 lines 22-45).

Allowable Subject Matter

5. Claims 4-12, 19-27, 33-41, 44-46, 50-58, 61-64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 65-70 are allowed.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marthe Y Marc-Coleman whose telephone number is (703) 305-4970. The examiner can normally be reached on Monday-Thursday from 9:30 AM - 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A Cuchlinski can be reached on (703) 308-3873. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Patent Examiner
Marthe Y. Marc-Coleman
Marthe Marc-Coleman

January 15, 2004

Notice of References Cited	Application/Control No. 10/267,959	Applicant(s)/Patent Under Reexamination KANE ET AL.	
	Examiner Marthe Y Marc-Coleman	Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,609,049	08-2003	Kane et al.	701/19
	B	US-5,828,979	10-1998	Polivka et al.	701/117
	C	US-2002/0096605	07-2002	Berry et al.	246/292
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Form PTO 1449 (Modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/267,959
	APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)	FILING DATE October 10, 2002	GROUP ART UNIT 3611/3680

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
MYM	A	5,129,605	07/14/92	Burns, et al.			
	B	6,459,965	10/01/02	Polivka, et al.			
	C	6,081,769	06/27/00	Curtis.			
	D	6,218,961	04/17/01	Gross, et al.			
	E	5,751,569	05/12/98	Metel, et al.			
	F	6,135,396	10/24/00	Whitfield, et al.			
	G	6,397,147	05/28/02	Whithead			
	H	6,374,184	04/16/02	Zahm, et al.			
	I	6,421,587	07/16/02	Diana, et al.			
	J	6,135,396	10/24/00	Whitfield, et al.			
	K	6,459,964	10/01/02	Vu, et al.			
	L	6,377,877	04/23/02	Doner			
	M	6,322,025	11/27/01	Colbert, et al.			
	N	6,311,109	10/30/01	Hawthorne, et al.			
	O	5,828,979	10/27/98	Polivka, et al.			
	P	4,711,418	12/08/87	Aver, Jr., et al.			
	Q	5,867,122	02/02/99	Zahm, et al.			
	R	4,459,668	07/10/84	Inoue, et al.			
	S	6,102,340	08/15/00	Peek, et al.			
	T	5,533,695	07/09/96	Heggestad, et al.			
	U	5,452,870	09/26/95	Heggestad			
	V	5,340,062	08/23/94	Heggestad			
	W	5,950,966	09/14/99	Hungate, et al.			
MYM	X	5,398,894	03/21/95	Pascoe			

EXAMINER Marthe Y. Marc-Coleman DATE CONSIDERED 1/15/03

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Form PTO 1449 (Modified)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/267,980
		APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)		FILING DATE October 10, 2002	GROUP ART UNIT 3617 3661

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
MYM	Y	6,049,745	04/11/00	Douglas et al.			
	Z	4,181,943	01/01/80	Mercer, Sr. et al.			
	AA	4,561,057	12/24/85	Haley, Jr. et al.			
	AB	5,072,900	12/17/91	Malon			
	AC	5,177,685	01/05/93	Davis et al.			
	AD	5,332,180	07/26/94	Peterson et al.			
	AE	5,364,047	11/15/94	Petit et al.			
	AF	5,394,333	02/28/95	Kao			
	AG	5,620,155	04/15/97	Michalek			
	AH	5,699,986	12/23/97	Welk			
	AI	5,740,547	04/14/98	Kull et al.			
	AJ	5,978,718	11/02/99	Kull			
	AK	5,995,881	11/30/99	Kull			
	AL	5,803,411	09/08/98	Ackerman et al.			
	AM	5,944,768	08/31/99	Ito et al.			
	AN	6,179,252 B1	01/30/01	Roop et al.			
	AO	6,345,233 B1	02/05/02	Erick			
	AP	6,371,416 B1	04/16/02	Hawthorne			
	AQ	6,373,403 B1	04/16/02	Korver et al.			
	AR	6,456,937 B1	09/24/02	Doner et al.			
	AS	6,487,478 B1	11/26/02	Azzaro et al.			
MYM							

EXAMINER Marthe Y. Marc-Coleman DATE CONSIDERED 1/15/03

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Form PTO 1449 (Modified)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/267,959
		APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)		FILING DATE October 10, 2002	GROUP ART UNIT 3661

			OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)
MYM		AT	"Testimony of Jolene M. Molitoris, Federal Railroad Administrator, U.S. Department of Transportation before the House Committee on Transportation and Infrastructure Subcommittee on Railroads", Federal Railroad Administration, United States Department of Transportation, April 1, 1998.
	/	AU	"System Architecture, ATCS Specification 100", May 1995.
	/	BA	"A New World for Communications & Signaling", Progressive Railroading, May 1986.
	/	BB	"Advanced Train Control Gain Momentum", Progressive Railroading, March 1986.
	/	BC	"Railroads Take High Tech in Stride", Progressive Railroading, May 1985.
		BD	Lyle, Denise, "Positive Train Control on CSXT", Railway Fuel and Operating Officers Association, Annual Proceedings, 2000.
	/	BE	Lindsey, Ron A., "C B T M, Communications Based Train Management", Railway Fuel and Operating Officers Association, Annual Proceedings, 1999.
	/	BF	Moody, Howard G, "Advanced Train Control Systems A System to Manage Railroad Operations", Railway Fuel and Operating Officers Association, Annual Proceedings, 1993.
	/	BG	Ruegg, G.A., "Advanced Train Control Systems ATCS", Railway Fuel and Operating Officers Association, Annual Proceedings, 1986.
		BH	Malone, Frank, "The Gaps Start to Close"Progressive Railroading, May 1987.
	/	BI	"On the Threshold of ATCS", Progressive Railroading, December 1987.
	/	BJ	"CP Advances in Train Control", Progressive Railroading, September 1987.
	/	BK	"Communications/Signaling: Vital for dramatic railroad advances", Progressive Railroading, May 1988.
	/	BL	"ATCS's System Engineer", Progressive Railroading, July 1988.
	/	BN	"The Electronic Railroad Emerges", Progressive Railroading, May 1989.
	/	BM	"C^3 Comes to the Railroads", Progressive Railroading, September 1989.
	/	BO	"ATCS on Verge of Implementation", Progressive Railroading, December 1989.
	/	BP	"ATCS Evolving on Railroads", Progressive Railroading, December 1992.
	/	BQ	"High Tech Advances Keep Railroads Rolling", Progressive Railroading, May 1994.
	/	BR	"FRA Promotes Technology to Avoid Train-To-Train Collisions", Progressive Railroading, August 1994.
	/	BS	"ATCS Moving slowly but Steadily from Lab for Field", Progressive Railroading, December 1994.
	/	BT	Judge, T., "Electronic Advances Keeping Railroads Rolling", Progressive Railroading, June 1995.
MYM		BU	"Electronic Advances Improve How Railroads Manage", Progressive Railroading, December 1995.

EXAMINER	Martha Y. Marc-Coleman	DATE CONSIDERED	1/15/03

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Form PTO 1449 (Modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/267,959
	APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)	FILING DATE October 10, 2002	GROUP ART UNIT 3617 3661

			U.S. PATENT DOCUMENTS
			OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)
MYM	/	BV	Judge, T., "BNSF/UP PTS Pilot Advances in Northwest", Progressive Railroading, May 1996.
	/	BW	Foran, P., "Train Control Quandary, Is CBTC viable? Railroads, Suppliers Hope Pilot Projects Provide Clues", Progressive Railroading, June 1997.
	/	BX	"PTS Would've Prevented Silver Spring Crash: NTSB", Progressive Railroading, July 1997.
	/	BY	Foran, P., "A 'Positive' Answer to the Interoperability Call", Progressive Railroading, September 1997.
	/	BZ	Foran, P., "How Safe is Safe Enough?", Progressive Railroading, October 1997.
	/	CA	Foran, P., "A Controlling Interest In Interoperability", Progressive Railroading, April 1998.
	/	CB	Derocher, Robert J., "Transit Projects Setting Pace for Train Control", Progressive Railroading, June 1998.
	/	CC	Kube, K., "Variations on a Theme", Progressive Railroading, December 2001.
	/	CD	Kube, K., "Innovation in Inches", Progressive Railroading, February 2002.
	/	CE	Vantuono, W., "New York Leads a Revolution", Railway Age, September 1996.
	/	CF	Vantuono, W., "Do you know where your train is?", Railway Age, February 1996.
	/	CG	Gallamore, R., "The Curtain Rises on the Next Generation", Railway Age, July 1998.
	/	CH	Burke, J., "How R&D is Shaping the 21st Century Railroad", Railway Age, August 1998.
	/	CI	Vantuono, W., "CBTC: A Maturing Technology", Third International Conference On Communications Based Train Control, Railway Age, June 1999.
	/	CJ	Sullivan, T., "PTC - Is FRA Pushing Too Hard?", Railway Age, August 1999.
	/	CK	Sullivan, T., "PTC: A Maturing Technology", Railway Age, April 2000.
	/	CL	Moore, W., "How CBTC Can Increase Capacity", Railway Age, April, 2001.
	/	CM	Vantuono, W., "CBTC: The Jury is Still Out", Railway Age, June 2001.
	/	CN	Vantuono, W., "New-tech Train Control Takes Off", Railway Age, May 2002.
	/	CO	Union Switch & Signal Intermittent Cab Signal, Bulletin 53, 1998.
	/	CP	GE Harris Product Sheet: "Advanced Systems for Optimizing Rail Performance" and "Advanced Products for Optimizing train Performance", undated.
	/	CQ	GE Harris Product Sheet: "Advanced, Satellite-Based Warning System Enhances Operating Safety", undated
	/	CR	Furman, E., et al., "Keeping Track of RF", GPS World, February 2001.
	/	CS	Walker, Publication No. US 2001/0056544 A1, December 27, 2001.
MYM		CT	Gazit et al., Publication No. US 2002/0070879 A1, June 13, 2002.

EXAMINER Marthe Y. Marc-Coleman	DATE CONSIDERED 1/15/03

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

Form PTO 1449 (Modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/260,959
	APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)	FILING DATE October 10, 2002	GROUP ART UNIT ~~3617~~ 3661

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)		
MYM	CU	Department of Transportation Federal Railroad Administration, Federal Register, Vol. 66, No. 155, pp. 42352-42396, August 10, 2001.
	CV	
	CW	
	CX	

EXAMINER Marthe Y. Marc-Coleman DATE CONSIDERED 1/15/03

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

DOCKET NO. 3805-001-27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Mark Edward KANE, et al. ART UNIT: 3661

SERIAL NO.: 10/267,959 EXAMINER: Marthe Y. Marc Coleman

FILING DATE: October 10, 2002

FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

REQUEST FOR RECONSIDERATION

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

SIR:

Responsive to the outstanding Office Action dated January 22, 2004, reconsideration is respectfully requested in light of the following remarks.

REMARKS

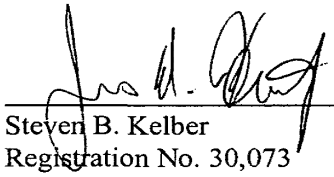
Applicants wish to thank Examiner Marc-Coleman for the courtesy of a telephonic interview with Applicant's representative, James M. Heintz, on February 2, 2004. At the interview, Applicant's representative stated that the §102(e) rejection over Kane, et al. (U.S. Patent No. 6,609,049) was improper because the application and Kane, et al. have the same inventors. The Examiner agreed and indicated that the rejection would be withdrawn upon the submission of a written response.

Accordingly, Applicants request the withdrawal of the rejection Claims 1-3, 13-18, 28-32, 42, 43, 47-49, 59 and 60 over Kane, et al. as Kane, et al. and the present application have the same inventors.

In light of the above, Applicants submit that this application is now in condition for allowance and therefore request favorable consideration. If any issues remain which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact Applicants' counsel, James M. Heintz at (202) 861-4167.

Respectfully submitted,

PIPER RUDNICK LLP



Steven B. Kelber
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Attorney of Record

James M. Heintz
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1200 Nineteenth Street, N.W.
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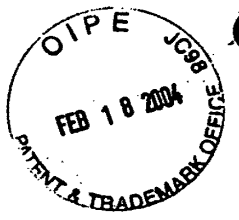

#4 Req for Recon 6/4/4

PIPER RUDNICK LLP
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WASHINGTON, DC 20036-2412
TELEPHONE: 202-861-3900
FACSIMILE: 202-223-2085

DOCKET NO.: 3805-001-27

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE, et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3661
Examiner: Marthe Y. Marc Coleman

SIR:

Attached hereto for filing are the following papers:

Request for Reconsideration

Our check in the amount of $ 0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

PIPER RUDNICK LLP

Steven B. Kelber
Attorney of Record
Registration No.: 30,073

James M. Heintz
Registration No. 41,828

Docket No. [redacted]05-001-27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION: Mark Edward KANE, et al. GROUP ART UNIT: 3661

SERIAL NUMBER: 10/267,959 EXAMINER: Marthe Y. Marc Coleman

FILED: October 10, 2002

FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. 1.97

Assistant Commissioner for Patents
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Sir:

Applicant(s) wish(es) to disclose the following information.

REFERENCES

■ Applicant(s) wish(es) to make of record the documents listed on the attached International Search Report and Form PTO-1449. Copies of the listed documents are attached, where required, as are either statements of relevancy or any readily available full or partial English translations of any non-English-language documents.

RELATED CASES

□ Attached is a list of Applicant's(s') pending applications and issued patents which may be related to the present application. Copies of the documents, where required, are attached along with Form PTO-1449.

CERTIFICATION

The undersigned certifies that

■ each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application for the first time (to the knowledge of the undersigned, having made reasonable inquiry) not more than three months prior to the filing of this statement.

□ no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign or international patent office in a counterpart foreign or international application or, to the knowledge of the undersigned, having made reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement.

BASIS FOR CONSIDERATION

This Information Disclosure Statement is filed:

□ without fee and within three months of the filing date of the application.
□ without fee and within three months of the date of entry of the U.S. national stage.
□ without fee and before the mailing date of a first Office Action on the merits (to the knowledge of the undersigned).
■ without fee and with the appropriate certification above.
□ without fee and with a new CPA application.
□ without fee and with a Request for Continued Examination.
□ with fee and before the mailing date of any of a Final Office Action, Notice of Allowance or an action that otherwise closes prosecution (to the knowledge of the undersigned).
□ with fee, appropriate certification above, and before payment of the Issue Fee.

DEPOSIT ACCOUNT

■ Please charge any additional fees for the papers being filed herewith and for which no check is enclosed herewith, or credit any overpayment to Deposit Account No. 50-1442.

Respectfully submitted,

PIPER RUDNICK LLP

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James M. Heintz
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DOCKET NO.: 3805-001-27

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE, et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3617
Examiner: Marthe Y. Marc Coleman

SIR:

Attached hereto for filing are the following papers:

Information Disclosure Statement
International Search Report
Form PTO 1449
Cited Documents (2)

Our check in the amount of $ 0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

PIPER RUDNICK LLP

Steven B. Kelber
Attorney of Record
Registration No.: 30,073

James M. Heintz
Registration No. 41,828

Form PTO 1449 (Modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET NO. 3805-001-27	SERIAL NO. 10/267,959
	APPLICANT Mark Edward KANE, et al.	
LIST OF REFERENCES CITED BY APPLICANT (Use Several Sheets if Necessary)	FILING DATE October 10, 2002	GROUP ART UNIT 3661

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
MYM	AA	6,609,049	08/19/03	Kane, et al.	—	—	
MYM	AB	2002/0096605 A1	07/25/02	Berry, et al.	—	—	
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION YES	TRANSLATION NO
	AK					
	AL					
	AM					
	AN					
	AO					

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

	AP	
	AQ	
	AR	
	AS	

EXAMINER Marthe Y. Marc-Coleman DATE CONSIDERED 5/17/04

*EXAMINER: Initial if reference is considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Thursday, June 17, 2004

Hide?	Set Name	Query	Hit Count
		DB=PGPB; PLUR=YES; OP=ADJ	
☐	L22	20020096605	1
		DB=USPT; PLUR=YES; OP=ADJ	
☐	L21	20020096605	0
		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ	
☐	L20	l11 and L19	17
☐	L19	control$4 same train	122303
☐	L18	l2 and l11	21
☐	L17	L15 AND SWITCH$2	2
☐	L16	GATE AND L15	0
☐	L15	5950966.PN.	2
☐	L14	L2 AND L13	10
☐	L13	SWITCH AND L12	12
☐	L12	L11 AND L1	23
☐	L11	(GRADE CROSSING GATE)	29
☐	L10	INTERROGAT$ AND L9	571
☐	L9	IDENTI$9 AND L8	3618
☐	L8	((RECEIV$3) SAME (MESSAGE OR RESPONSE OR DATA)) AND L7	4343
☐	L7	L5 AND L6	4538
☐	L6	(TRANSMIT$4 OR SEND$3 OR SENT) SAME (MESSAGE) SAME (DEVICE OR GRADE NEAR1 CROSSING NEAR1 GATE OR SWITCH$4)	74662
☐	L5	(TRANSCEIVER OR TRANSMIT$4) AND L2	101212
☐	L4	L3	4472
☐	L3	TRANSCEIVER AND L2	4472
☐	L2	(control$4) AND L1	223620
☐	L1	train or locomotive or (rail vehicle) or (railroad vehicle)	355007

END OF SEARCH HISTORY

h e b b cg b chh e gg f c e c c e

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 07/07/2004

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
MARC COLEMAN, MARTHE Y	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 07/07/2004

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

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Marthe Y Marc-Coleman	3661	

-- *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* MONTH(S) 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 the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- 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 *10 February 2004*.

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

3)☐ 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

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-70* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/17/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to request for reconsideration filed on February 10, 2004.

Claim Rejections - 35 USC § 102

2. 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1, 3, 4, 5-15, 17-30, 32-47, 49 and 50-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Hungate et al. (U.S. Patent No. 5,950,966).

Hungate et al. discloses a system and method for controlling a train comprising a control unit 31, transceivers 30 located on the in communication with the control unit. Transceivers on the train, shown as the on board system 30 communicate with the wayside controllers 20. The control unit transmitted an interrogation message to a configurable device near the train; listening for a response from the configurable device, the response including a configuration of the configurable device; allowing the train to continue if a response with a correct configuration is received within a period of time and stopping the train otherwise (see col. 6 lines 23-55). The system also warns the operator, and if the operator does not get the warning the system automatically applied brake to stop the train. The system is able to operate the brakes based on information received, which includes the length and weight of the train. Hungate further discloses that the device is a switch (see col. 2 lines 20-35).

Claim Rejections - 35 USC § 102

3. 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) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-70 are rejected under 35 U.S.C. 102(a) as being anticipated by Berry et al. (Pub. No. US 2002/0096605).

Berry et al. discloses a system and method for controlling a train (see abstract) comprising a control unit, a transceiver located on the train in communication with the control unit. The control unit transmitted an interrogation message to a configurable device near the train; listening for a response from the configurable device, the response including a configuration of the configurable device; allowing the train to continue if a response with a correct configuration is received within a period of time and stopping the train otherwise (see [0002], [0007] - [0016], [0031] - [0048]). The system also warns the operator, and if the operator does not get the warning the system automatically applied brake to stop the train. The system is able to operate the brakes based on information received, which includes the length and weight of the train. Hungate further discloses that the device is a switch (see [0002], [0007] - [0016], [0031] - [0048]).

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marthe Y Marc-Coleman whose telephone number is (703) 305-4970. The examiner can normally be reached on Monday-Thursday from 9:30 AM - 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tomas G Black can be reached on (703) 305-8233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

Patent Examiner
Marthe Y. Marc-Coleman
Marthe Y. Marc-Coleman

June 17, 2004

Notice of References Cited	Application/Control No. 10/267,959	Applicant(s)/Patent Under Reexamination KANE ET AL.	
	Examiner Marthe Y Marc-Coleman	Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,950,966	09-1999	Hungate et al.	246/62
	B	US-2002/0096605	07-2002	Berry et al.	246/292
	C	US-			
	D	US-			
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	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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3661

DOCKET NO. 3805-001-27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Mark Edward KANE, et al. ART UNIT: 3661
SERIAL NO.: 10/267,959 EXAMINER: M. Y. Marc Coleman
FILING DATE: October 10, 2002
FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

SIR:

Responsive to the outstanding Office Action dated July 7, 2004, entry of the following amendments is respectfully requested.

IN THE CLAIMS

1. (Original) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise.

2. (Original) The system of Claim 1, wherein the device is a grade crossing gate.

3. (Original) The system of Claim 1, wherein the device is a switch.

4. (Original) The system of Claim 1, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

5. (Original) The system of Claim 1, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

6. (Original) The system of Claim 1, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable

devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

7. (Original) The system of Claim 6, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

8. (Original) The system of Claim 7, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

9. (Original) The system of Claim 7, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

10. (Original) The system of Claim 9, wherein the threshold is further based on a weight of the train.

11. (Original) The system of Claim 9, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

12. (Original) The system of Claim 11, wherein the threshold is further based on distribution of weight in the train.

13. (Original) The system of Claim 1, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

14. (Original) The system of Claim 13, wherein the control unit is further configured to

perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

15. (Currently Amended) A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

16. (Original) The method of Claim 15, wherein the device is a grade crossing gate.

17. (Original) The method of Claim 15, wherein the device is a switch.

18. (Original) The method of Claim 16, further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information.

19. (Original) The method of Claim 15, wherein the response includes an identification number of the device and the method further comprises the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

20. (Original) The method of Claim 15, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

21. (Original) The method of Claim 15, further comprising the steps of:

identifying a configurable device in a database which is a next device which the train will pass based on information from a positioning system located on the train; and

obtaining an identification number associated with the device identified in the identifying step from the database.

22. (Original) The method of Claim 21, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

23. (Original) The method of Claim 22, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

24. (Original) The method of Claim 22, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

25. (Original) The method of Claim 24, wherein the threshold is further based on a weight of the train.

26. (Original) The method of Claim 24, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

27. (Original) The method of Claim 26, wherein the threshold is further based on distribution of weight in the train.

28. (Original) The method of Claim 15, further comprising the step of activating a warning device when a response with a correct configuration is not received.

29. (Original) The method of Claim 28, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

30. (Original) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

31. (Original) The system of Claim 30, wherein the device is a grade crossing gate.

32. (Original) The system of Claim 30, wherein the device is a switch.

33. (Original) The system of Claim 30, wherein the response includes an identification number of the device and wherein the control unit is further configured to perform the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

34. (Original) The system of Claim 30, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

35. (Original) The system of Claim 30, further comprising:

a positioning system, the positioning system being in communications with the control

unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identification number from the database associated with the device identified in the identifying step.

36. (Original) The system of Claim 35, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

37. (Original) The system of Claim 35, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

38. (Original) The system of Claim 35, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

39. (Original) The system of Claim 38, wherein the threshold is further based on a weight of the train.

40. (Original) The system of Claim 38, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

41. (Original) The system of Claim 40, wherein the threshold is further based on distribution of weight in the train.

42. (Original) The system of Claim 30, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device

when a response with a correct configuration is not received.

43. (Original) The system of Claim 42, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

44. (Original) The system of Claim 30, wherein the period of time is based on a worst-case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

45. (Original) The system of Claim 30, further comprising a positioning system in communication with the control unit and located on the train, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train. track.

46. (Original) The system of Claim 45, further comprising a track database in communication with the control unit, wherein the period of time is further based on a grade of a section of track between the train and the device.

47. (Currently Amended) A method for controlling a train comprising the steps of:

transmitting an interrogation message <u>from the train</u> to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if a response with a correct configuration is not received or if no response is received,

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time,

maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received.

48. (Original) The method of Claim 47, wherein the device is a grade crossing gate.

49. (Original) The method of Claim 47, wherein the device is a switch.

50. (Original) The method of Claim 47, wherein the response includes an identification number of the device and further comprising the step of confirming that identification number received in the response corresponds to the device to which the interrogation message was directed.

51. (Original) The method of Claim 47, wherein the interrogation message includes an identification number of a device for which the interrogation message is intended.

52. (Original) The method of Claim 47, further comprising the steps of:

identifying a configurable device in the database which is a next device which the train will pass based on information from a positioning system; and

obtaining an identification number associated with the device identified in the identifying step from a database.

53. (Original) The method of Claim 52, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

54. (Original) The method of Claim 52, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

55. (Original) The method of Claim 52, further comprising the step of calculating the threshold based at least in part upon the current speed of the train.

56. (Original) The method of Claim 55, wherein the threshold is further based on a weight of the train.

57. (Original) The method of Claim 55, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

58. (Original) The method of Claim 57, wherein the threshold is further based on distribution of weight in the train.

59. (Original) The method of Claim 47, further comprising the step of activating a warning device when a response with a correct configuration is not received.

60. (Original) The method of Claim 59, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

61. (Original) The method of Claim 47, wherein the period of time is based on a worst-case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

62. (Original) The method of Claim 47, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train.

63. (Original) The method of Claim 62, wherein the period of time is further based on a grade of a section of track between the train and the device.

64. (Original) The method of Claim 63, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether a configuration received from the switch is correct by comparing a direction of the switch to a desired direction of the switch based on the route information.

65. (Original) A method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

stopping the train if a response from the device indicates that the device is not properly configured or if a response is not received within the period of time.

66. (Original) The method of Claim 65, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

67. (Original) The method of Claim 65, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

68. (Original) A computerized method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identification number of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identification number of the next configurable device;

waiting a first period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the first period of time;

if the response is received, comparing an identification number included in the response to the identification number of the next configurable device;

providing a warning to an operator if a response from the device indicates that the device is not properly configured or if a response is not received within the first period of time;

stopping the train if the operator does not acknowledge the warning and slow the train to a reduced speed within a second period of time; and

if the warning is acknowledged and the reduced speed is achieved within the second period of time, maintaining the reduced speed until the operator verifies that the device is configured properly or until the train has passed the device;

69. (Original) The method of Claim 68, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

70. (Original) The method of Claim 68, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

REMARKS

Claims 1-70 are pending in the application.

Claims 1, 3-15, 17-30, 32-47, 49 and 50-70 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,950,966 ("Hungate"). This rejection is respectfully traversed for the reasons set forth below.

Claims 1, 3-15, 17-30, 32-47, 49, and 50-64 include the steps of transmitting or sending "an interrogation message to a configurable device" and "listening for a response from the configurable device, the response including a configuration of the configurable device." These steps are not disclosed in Hungate.

Hungate discloses a system in which trains communicate with wayside controllers that pass along movement authorities to the train and, in some embodiments, issue incremental movement authorities for the train. Col. 3, lines 26-35 and 46-54. Hungate also discloses that his system can be implemented to "accommodate monitored manual switches or remote powered switches" at col. 2, lines 20-35. Such switches are configurable devices. The office action apparently takes the position that the disclosure in Hungate that some embodiments can accommodate such switches means that the wayside controllers will report the configuration of such switches in response to an interrogation message as required by Claims 1, 3-15, 17-30, 32-47, 49, and 50-64. This is not correct.

First, Hungate makes clear that the way in which his system accommodates such switches is by having the switches communicate with the wayside controllers 20 rather than with any system on the train. Col. 3, lines 55-60 disclose that the logic circuitry 21 (which is a part of the wayside controller 20, see Figure 3) confirm that there are no conflicting switch settings prior to executing an incremental authority. Thus, any communication of the status of the switch occurs between the switch and the wayside controllers, not between the train and the switch as required

by Claims 1, 3-15, 17-30, 32-47, 49, and 50-64.

Second, there is no disclosure in Hungate that any information regarding the configuration of the switch is transmitted to a train. Indeed, given that the wayside controller resolves any conflict between movement authorities and switch positions before issuing the movement authorities, there is simply no reason to transmit switch configuration information to a train in Hungate's system.

Third, Hungate is silent as to how communications between the wayside controllers and the train occur. There is simply no disclosure in Hungate of any interrogation message being sent by the train to the wayside controller. Hungate's wayside controllers may simply broadcast movement authorities to nearby trains in the area in the same manner in which conventional cab signal system broadcast signal aspects to nearby trains without any interrogation messages being sent form the train.

For the foregoing reasons, withdrawal of the rejections of Claims 1, 3-15, 17-30, 32-47, 49, and 50-64 is respectfully requested.

Claims 65-70 require "determining a location and identification number of a next configurable device that will be passed by the train from a database" and "sending an interrogation message including the identification number of the next configurable device." Neither step is disclosed by Hungate. As discussed above, Hungate is simply silent as to how communications between the train and the wayside controllers are initiated. Moreover, Hungate states at col. 2, lines 21-26 that the "present invention . . . does not require an onboard train database . . . ." Accordingly, withdrawal of the rejections of Claims 65-70 is respectfully requested.

Claims 1-70 stand rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent Application Publication No. US 2002/0096605 ("Berry"). This rejection is respectfully traversed.

The office action relies on paragraphs 0002, 0007-0016, and 0031-0048 of Berry as disclosing a control unit that transmits an interrogation message to a configurable device, listens for a response including a configuration of the configurable device, and allows the train to continue if a response with a correct configuration is received. This is simply not correct.

Berry's system is primarily concerned with controlling the speed of a train as it passes a grade crossing to ensure that the grade crossing gate is not activated too early or too late. Berry's system transmits a message to a grade crossing gate controller to activate a gate. See, e.g., Figs 7 and 11 and paragraph 0031. However, an activation message is not an interrogation message as required in each of the currently pending claims. An activation message activates a device (in this case, to lower the grade crossing gate). In contrast, an interrogation message requires a response. There is no teaching in Berry that the grade crossing gate controller transmits its configuration back to the train or transmits any other response back to the train. Indeed, while, Berry's gate controller (shown in Figure 6) includes a receiver 24 for receiving an activation message, there is no transmitter in Berry's gate controller for transmitting a response to an interrogation message to the train. Similarly, while Berry's CBTC 12 includes a wireless transmitter 20 for transmitting an activation message, there is no receiver in the CBTC 12 for receiving a response from the gate controller.

Still further, there is no disclosure in Berry for stopping the train if the gate controller indicates that it is not properly configured. Berry only discloses activating the train's brakes to slow the train in order to ensure that it stays within a speed profile as discussed in paragraphs 0046-0047.

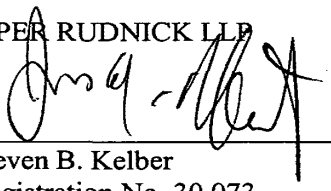
Accordingly, Berry neither discloses or suggests sending an "interrogation message" to a configurable device such as a grade crossing gate or "listening for a response from the configurable device" as required in each of the currently-pending claims. Moreover, several of

the currently pending claims include additional limitations that are also not disclosed in Berry. For example, independent Claims 1, 15, 30 ,47, 65, 68 include the step of "stopping the train." In contrast, Berry's system only slows the train to keep it within a speed profile, it does not stop the train. Independent Claim 65 includes the step of "comparing an identification number included in the response to the identification number of the next configurable device." There is no disclosure in Berry of any identification numbers associated with any of the gate controllers. There are yet additional limitations in the various independent claims and dependent claims that are not disclosed in Berry. For all of the foregoing reasons, withdrawal of the rejections of Claims 1-70 based on Berry is respectfully requested.

In light of the above, Applicants submit that this application is now in condition for allowance and therefore request favorable consideration. If any issues remain which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact Applicants' counsel, James M. Heintz at (202) 861-4167.

Respectfully submitted,

PIPER RUDNICK LLP



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ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE, et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3661
Examiner: M. Y. Marc Coleman

SIR:

Attached hereto for filing are the following papers:

Amendment

Our check in the amount of $ 0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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James M. Heintz
Registration No.: 41,828

9/1/04

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	31475	train and safety	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 10:04
S2	4	S1 and switch and (grade adj crossing adj gate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 10:08
S3	345	701/19.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 11:09
S4	2	("5828979").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2004/12/20 11:09
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S9	419	S8 and (signal or message)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 12:09
S10	355	S9 and (listening or receiving or receiver)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 12:25
S11	96	S8 not S10	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 12:26
S12	350	246/124.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 14:38
S13	69	S12 and (transmitting or transmitter or transceiver)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/12/20 14:39
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S16	28	("1882265" | "2137719" | "3758775" | "3888437" | "4788498" | "4887205" | "4931793" | "5092544" | "5196846" | "5554982").PN. OR ("5864304"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:24
S17	122	105/1.4, S12.S16.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:27
S18	75	105/1.5.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:27
S19	436	116/36,37.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:28
S20	7	S19 and (transceiver or transmitter or transmitting)	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:28
S21	313	246/1C.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:29
S22	16	S21 and (transmitter or transceiver)	US-PGPUB; USPAT; USOCR	OR	ON	2004/12/20 15:29

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 01/03/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 01/03/2005

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

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Christine M. Behncke	3661	

-- 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 MONTH(S) 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 the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- 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 *13 September 2004*.

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

3)☐ 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

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *65-70* is/are allowed.

6)☒ Claim(s) *1,2,5,13-16,20,28-31,34,42,43,47,48,51,59 and 60* is/are rejected.

7)☒ Claim(s) *3,4,6-12,17-19,21-27,32,33,35-41,44-46,49,50,52-58 and 61-64* is/are objected to.

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

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2002* 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Page 5, line 3 element "map database 140" was previously assigned reference number 130, Figure 1.

Page 10, line 6 element "event recorder 140" is not illustrated in Drawings.

Appropriate correction is required.

Claim Objections

2. Claim 18 is objected to as failing to provide proper antecedent basis for the claimed subject matter depending from Claim 16.

Claim Rejections - 35 USC § 102

3. 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 5, 13-16, 20, 28-31, 34, 42, 43, 47, 48, 51, 59, and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Petit et al. US Patent No. 5,092,544.

5. Regarding Claims 1, 15, 30 and 47, Petit discloses a system and method for controlling a train comprising: a control unit (CPU 58); and a transceiver (radio 64), the

transceiver being located on the train and being in communication with the control unit (Figure 2); wherein the control unit is configured to perform the steps of transmitting an interrogation message from the train to a configurable device near the train (Column 4, lines 27-38); listening for a response from the configurable device, the response including a configuration of the configurable device (Column 5, lines 41-44 and Column 7, lines 53-57); allowing the train to continue if a response with a correct configuration is received within a period of time (Column 6, lines 23-36 and lines 1-7); and stopping the train otherwise (Column 6, lines 1-7).

6. Further (Claims 30 and 47), if no response is received or is a response with an incorrect configuration is received, activating a warning device to provide a warning to a train operator (Column 6, lines 1-7 and 30-32); stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time (Column 6, lines 1-7 and 30-36); and if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received (Column 6, lines 1-7 and Column 8, lines 45-50).

7. Regarding Claims 2, 16, 31 and 48 Petit discloses wherein the device is a grade crossing gate (Column 1, lines 8-10).

8. Regarding Claims 5, 20, 34 and 51Petit discloses wherein the interrogation message includes an identification number of a device for which the interrogation message is intended (Column 4, lines 61-67).

9. Regarding Claims 13, 28, 42, and 59 Petit discloses a warning device connected to the control unit (Figure 2), wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received (Column 6, lines 1-7).

10. Regarding Claims 14, 29, 43, and 60 Petit discloses wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received (Column 6, lines 14-36).

Allowable Subject Matter

11. Claims 3, 4, 6-12, 17-19, 21-27, 32, 33, 35-41, 44-46, 49, 50, 52-58, and 61-64 are objected to as being dependent upon a rejected base claim and are at present considered to overcome the prior art of record if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claims 65-70 are at present considered allowable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine M. Behncke whose telephone number is (703) 305-0589. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (703) 305-8233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

12/20/2004

12/23/04

RICHARD M. CAMBY
PRIMARY EXAMINER
GROUP 3661

Notice of References Cited	Application/Control No. 10/267,959	Applicant(s)/Patent Under Reexamination KANE ET AL.	
	Examiner Christine M. Behncke	Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,092,544	03-1992	Petit et al.	246/126
	B	US-5,803,411	09-1998	Ackerman et al.	246/169R
	C	US-5,950,966	09-1999	Hungate et al.	246/62
	D	US-2002/0096605	07-2002	Berry et al.	246/292
	E	US-5,978,718	11-1999	Kull, Robert C.	701/19
	F	US-6,345,233	02-2002	Erick, Jack M.	701/301
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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Bib Data Sheet

CONFIRMATION NO. 1510

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/267,959	10/10/2002 RULE	701	3661	3805-001-27

APPLICANTS

Mark Edward Kane, Orange Park, FL;

James Francis Shockley, Orange Park, FL;
Harrison Thomas Hickenlooper, Palatka, FL;

** CONTINUING DATA ********** None CMB

** FOREIGN APPLICATIONS ********** None CMB

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **
** 11/06/2002

Foreign Priority claimed	STATE OR	SHEETS	TOTAL	INDEPENDENT
☐ yes ☒ no	COUNTRY	DRAWING	CLAIMS	CLAIMS
35 USC 119 (a-d) conditions met ☐ yes ☒ no ☐ Met after Allowance	FL	4	70	6
Verified and Acknowledged Examiner's Signature Initials CMB				

ADDRESS
Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington , DC
20036-2412

TITLE
Method and system for ensuring that a train does not pass an improperly configured device

FILING FEE	FEES: Authority has been given in Paper	☐ All Fees
RECEIVED 946	No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue)

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/267,959	KANE ET AL.
Examiner	**Art Unit**
Christine M. Behncke	3661

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date								
Final	Original	12/20/04								
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Search Notes

Application/Control No.	Applicant(s)/Patent under Reexamination	
10/267,959	KANE ET AL.	
Examiner	**Art Unit**	
Christine M. Behncke	3661	

SEARCHED			
Class	Subclass	Date	Examiner
701	19	12/20/2004	CMB
105	1.4	12/20/2004	CMB
116	36	12/20/2004	CMB
116	37	12/20/2004	CMB

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST Text Search See Attached	12/20/2004	CMB

DLA PIPER RUDNICK GRAY CARY U.S. LLP
1200 NINETEENTH STREET, NW
WASHINGTON, DC 20036-2412
TELEPHONE: 202-861-3900
FACSIMILE: 202-223-2085

DOCKET NO.: 3805-001-27

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE, et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3661
Examiner: Christine N. Behncke

SIR:

Attached hereto for filing are the following papers:

Fee Transmittal
Amendment

Our check in the amount of $400.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

DLA PIPER RUDNICK GRAY CARY U.S. LLP

Steven B. Kelber
Attorney of Record
Registration No.: 30,073

James M. Heintz
Registration No.: 41,828

01/05

FEE TRANSMITTAL
FY 2005

Docket No.	3805-001-27
Serial No.	10/267,959
Filing Date	October 10, 2002
Inventor(s)	Mark Edward KANE, et al.
Group Art Unit	3661
Examiner	Christine M. Behncke

TOTAL AMOUNT OF PAYMENT	$400.00

1. ■ Applicant claims small entity status.
   ■ Charge any **UNDERPAYMENT** or credit any **OVERPAYMENT** in the indicated fees to Deposit Account No. 50-1442.
   □ Charge the indicated fees to Deposit Account No. 50-1442.
2. ■ Check enclosed.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Code	Large Entity Fee $	Small Entity Code	Small Entity Fee $	Fee Description	Fee Paid
1011	300	2011	150	Utility Fling Fee	
1012	200	2012	100	Design Filing Fee	
1013	200	2013	100	Plant Filing Fee	
1014	300	2014	150	Reissue Filing Fee	
1005	200	2005	100	Provisional Filing Fee	
1111	500	2111	250	Utility Search Fees	
1311	200	2311	100	Utility Examination Fees	
				SUBTOTAL	$0.00

2. EXTRA CLAIM FEES

tot. claims	70	-	70*	=	0	x	$25	=	0
ind. claims	10	-	6*	=	4	x	$100	=	400
□ Multiple Dependent Claims							$180	=	
								SUBTOTAL	400

3. APPLICATION SIZE FEES

Total # of Sheets		# of Extra Sheets
	- 100 =	0

# of each additional 50 sheets or fraction thereof (round up)	Fee	Total Fee Due
	x $125 =	0

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge-late filing fee or oath	
1053	130	1053	130	Non-English Specification	
1251	120	2251	60	1-mo. ext. of time	
1252	450	2252	225	2-mo. ext. of time	
1253	1020	2253	510	3-mo. ext. of time	
1254	1590	2254	795	4-mo. ext. of time	
1255	2160	2255	1080	5-mo. ext. of time	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Appeal Brief	
1403	1000	2403	500	Request for Oral	
1501	1400	2501	700	Utility/Reissue Issue	
1504	300	1504	300	Publication Fee	
8001	3	8001	3	Advance Copy of Patent	
1806	180	1806	180	IDS Submission	
8021	40	8021	40	Assignment Recordation	
1801	790	2801	395	For Filing RCE	
1814	130	2814	65	Terminal Disclaimer	
Other:					
				SUBTOTAL	0

Name	Steven B. Kelber	Registration No.	30,073		
Signature		Date	3/30/05	Telephone	202-861-3900
Name	James M. Heintz	Registration No.	41,828		

Rev. 01/05

DOCKET NO. 3805-001-27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Mark Edward KANE, et al. ART UNIT: 3661

SERIAL NO.: 10/267,959 EXAMINER: Christine M. Behncke

FILING DATE: October 10, 2002

FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

SIR:

Responsive to the outstanding Office Action dated January 3, 2005, entry of the following amendments is respectfully requested.

IN THE CLAIMS

1. (Currently Amended) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a ~~configurable device~~ switch near the train;

listening for a response from the ~~configurable device~~ switch, the response including a configuration of the ~~configurable device~~ switch;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise.

2. (Currently Amended) The system of Claim [[1]] 4, wherein the device is a grade crossing gate.

3. (Currently Amended) The system of Claim [[1]] 4, wherein the device is a switch.

4. (Currently Amended) ~~The system of Claim 1, wherein the response includes an identification number of the device and~~ A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a

configuration of the configurable device and an identifier of the device ;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise;

wherein the control unit is further configured to perform the step of confirming that the identifier ~~identification number~~ received in the response corresponds to the device to which the interrogation message was directed.

5. (Currently Amended) The system of Claim [[1]] 4, wherein the interrogation message includes an ~~identification number~~ identifier of a device for which the interrogation message is intended.

6. (Currently Amended) The system of Claim [[1]] 4, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an ~~identification number~~ identifier from the database associated with the device identified in the identifying step.

7. (Original) The system of Claim 6, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

8. (Original) The system of Claim 7, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

9. (Original) The system of Claim 7, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

10. (Original) The system of Claim 9, wherein the threshold is further based on a weight of the train.

11. (Original) The system of Claim 9, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

12. (Original) The system of Claim 11, wherein the threshold is further based on distribution of weight in the train.

13. (Currently Amended) The system of Claim [[1]] 4, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

14. (Original) The system of Claim 13, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

15. (Currently Amended) A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a ~~configurable device~~ switch near the train;

listening for a response from the ~~configurable device~~ switch, the response including a configuration of the ~~configurable device~~ switch;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

16. (Currently Amended) The method of Claim [[15]] 19, wherein the device is a grade crossing gate.

17. (Currently Amended) The method of Claim [[15]] 19, wherein the device is a switch.

18. (Currently Amended) The method of Claim [[16]] 15, further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information.

19. (Currently Amended) ~~The method of Claim 15, wherein the response includes an identification number of the device and the method further comprises the step of~~ A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the configurable device;

confirming that ~~identification number~~ the identifier received in the response corresponds to the configurable device to which the interrogation message was directed;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

20. (Currently Amended) The method of Claim [[15]] 19, wherein the interrogation message includes an ~~identification number~~ identifier of a device for which the interrogation message is intended.

21. (Currently Amended) The method of Claim [[15]] 19, further comprising the steps of:

identifying a configurable device in a database which is a next device which the train will pass based on information from a positioning system located on the train; and

obtaining an ~~identification number~~ identifier associated with the device identified in the identifying step from the database.

22. (Original) The method of Claim 21, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

23. (Original) The method of Claim 22, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

24. (Original) The method of Claim 22, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

25. (Original) The method of Claim 24, wherein the threshold is further based on a weight of the train.

26. (Original) The method of Claim 24, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

27. (Original) The method of Claim 26, wherein the threshold is further based on distribution of weight in the train.

28. (Currently Amended) The method of Claim [[15]] 19, further comprising the step of activating a warning device when a response with a correct configuration is not received.

29. (Original) The method of Claim 28, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

30. (Currently Amended) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a ~~configurable device~~ switch near the train;

listening for a response from the ~~configurable device~~ switch, the response including a configuration of the ~~configurable device~~ switch;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the ~~device~~ switch has been passed or a verification that passing the ~~device~~ switch is acceptable has been received.

31. (Currently Amended) The system of Claim [[30]] 33, wherein the device is a grade crossing gate.

32. (Currently Amended) The system of Claim [[30]] 33, wherein the device is a switch.

33. (Currently Amended) ~~The system of Claim 30, wherein the response includes an identification number of the device and~~ A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier associated with the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received;

wherein the control unit is further configured to perform the step of confirming that ~~identification number~~ identifier received in the response corresponds to the device to which the interrogation message was directed.

34. (Currently Amended) The system of Claim[[30]] 33 , wherein the interrogation message includes an ~~identification number~~ identifier of a device for which the interrogation message is intended.

35. (Currently Amended) The system of Claim [[30]] 33, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an ~~identification number~~ identifier from the database associated with the device identified in the identifying step.

36. (Original) The system of Claim 35, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

37. (Original) The system of Claim 35, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

38. (Original) The system of Claim 35, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

39. (Original) The system of Claim 38, wherein the threshold is further based on a weight of the train.

40. (Original) The system of Claim 38, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

41. (Original) The system of Claim 40, wherein the threshold is further based on distribution of weight in the train.

42. (Currently Amended) The system of Claim [[30]] 33, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

43. (Original) The system of Claim 42, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

44. (Currently Amended) The system of Claim [[30]] 33, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

45. (Currently Amended) The system of Claim [[30]] 33, further comprising a positioning system in communication with the control unit and located on the train, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train. track.

46. (Original) The system of Claim 45, further comprising a track database in communication with the control unit, wherein the period of time is further based on a grade of a section of track between the train and the device.

47. (Currently Amended) A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a ~~configurable device~~ switch near the train;

listening for a response from the ~~configurable device~~ switch, the response including a configuration of the ~~configurable device~~ switch;

allowing the train to continue if a response with a correct configuration is received;

if a response with a correct configuration is not received or if no response is received,

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the ~~device~~ switch is acceptable has been received.

48. (Currently Amended) The method of Claim [[47]] 50, wherein the device is a grade crossing gate.

49. (Currently Amended) The method of Claim [[47]] 50, wherein the device is a switch.

50. (Currently Amended) ~~The method of Claim 47, wherein the response includes an identification number of the device and further comprising the step of confirming that identification number~~ A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the configurable device;

allowing the train to continue if a response with a correct configuration is received and the identifier received in the response corresponds to the device to which the interrogation message was directed.

if a response with a correct configuration and an identifier corresponding to the configurable device to which the interrogation message was directed is not received, or if no response is received;

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the configurable device is acceptable has been received

51. (Currently Amended) The method of Claim [[47]] 50, wherein the interrogation message includes an ~~identification number~~ identifier of a device for which the interrogation message is intended.

52. (Currently Amended) The method of Claim [[47]] 50, further comprising the steps of:

identifying a configurable device in the database which is a next device which the train will pass based on information from a positioning system; and

obtaining an ~~identification number~~ identifier associated with the device identified in the identifying step from a database.

53. (Original) The method of Claim 52, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

54. (Original) The method of Claim 52, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

55. (Original) The method of Claim 52, further comprising the step of calculating the threshold based at least in part upon the current speed of the train.

56. (Original) The method of Claim 55, wherein the threshold is further based on a weight of the train.

57. (Original) The method of Claim 55, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

58. (Original) The method of Claim 57, wherein the threshold is further based on distribution of weight in the train.

59. (Currently Amended) The method of Claim [[47]] 50, further comprising the step of activating a warning device when a response with a correct configuration is not received.

60. (Original) The method of Claim 59, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

61. (Currently Amended) The method of Claim [[47]] 50, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

62. (Currently Amended) The method of Claim [[47]] 50, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train.

63. (Original) The method of Claim 62, wherein the period of time is further based on a grade of a section of track between the train and the device.

64. (Original) The method of Claim 63, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether a configuration received from the switch is correct by comparing a direction of the switch to a desired direction of the switch based on the route information.

65. (Original) A method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and ~~identification number~~ an identifier of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the ~~identification number~~ identifier of the next configurable device;

waiting a period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the period of time;

if the response is received, comparing an ~~identification number~~ identifier included in the response to the ~~identification number~~ identifier of the next configurable device;

stopping the train if a response from the device indicates that the device is not properly configured or if a response is not received within the period of time.

66. (Original) The method of Claim 65, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

67. (Original) The method of Claim 65, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

68. (Currently Amended) A computerized method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and ~~identification number~~ identifier of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the ~~identification number~~ identifier of the next configurable device;

waiting a first period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the first period of time;

if the response is received, comparing an ~~identification number~~ identifier included in the response to the ~~identification number~~ identifier of the next configurable device;

providing a warning to an operator if a response from the device indicates that the device is not properly configured or if a response is not received within the first period of time;

stopping the train if the operator does not acknowledge the warning and slow the train to a reduced speed within a second period of time; and

if the warning is acknowledged and the reduced speed is achieved within the second period of time, maintaining the reduced speed until the operator verifies that the device is configured properly or until the train has passed the device;

69. (Original) The method of Claim 68, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

70. (Original) The method of Claim 68, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

REMARKS

Applicants gratefully acknowledge the indication of allowable subject matter in Claims 3-4, 6-12, 17-19, 21-27, 32-33, 35-41; 44-46; 49, 50, 52-58; and 61-64.

Claims 1, 15, 30 and 47 have been amended to include the patentable subject matter in Claims 3, 17, 32, and 49, respectively. Accordingly, withdrawal of the rejections of these claims and the claims that depend from them is respectfully requested.

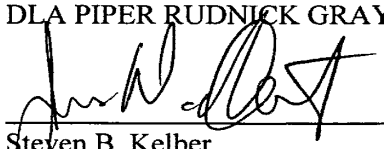
Claims 4, 19, 33 and 50 have been re-written in independent form to include all of the limitations of the original claims from which they depended, with the exception that the claim term "identification number" has been changed to the more broad term "identifier." Withdrawal of the rejections of these claims and the claims that depend from them is respectfully requested.

Claims 65-70 have also been amended by changing the term "identification number" has been changed to the more broad term "identifier."

In light of the above, Applicants submit that this application is now in condition for allowance and therefore request favorable consideration. If any issues remain which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact Applicants counsel, James M. Heintz at (202) 861-4167.

Respectfully submitted,

DLA PIPER RUDNICK GRAY CARY U.S. LLP



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PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

10/267,959

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	150.00	OR	BASIC FEE	300.00
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL		OR	TOTAL	

amdt 3-30-05

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 70	Minus	** 70	= 0
Independent	* 10	Minus	*** 4	= 6
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=	40000	OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE	406.Pd	OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	2	("4711418").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/06/02 15:02
L4	42	("1978286" | "2028497" | "2131042" | "2368826" | "2399738" | "2433281" | "3246143" | "3267281" | "3297868" | "3558874" | "3603786" | "3610920" | "3781541" | "3781542" | "3944173" | "4087066" | "4120471" | "4172576" | "4365777" | "4550444" | "4582280" | "4703303" | "4711418" | "4735383" | "4860977" | "4942395" | "4974259").PN. OR ("5092544").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 15:05
L7	41	("4093161" | "4122523" | "4179739" | "4361301" | "4561057" | "4774669" | "5390880" | "5650930").PN. OR ("5828979"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 15:20
L8	50	("20010056544" | "20020070879" | "20040006413" | "4181943" | "4459668" | "4561057" | "4711418" | "5026009" | "5072900" | "5129605" | "5177685" | "5332180" | "5340062" | "5364047" | "5394333" | "5398894" | "5452870" | "5533695" | "5620155" | "5699986" | "5740547" | "5751569" | "5803411" | "5828979" | "5867122" | "5944768" | "5950966" | "5956664" | "5978718" | "5995881" | "6049745" | "6081769" | "6102340" | "6135396" | "6179252" | "6218961" | "6311109" | "6322025" | "6345233" | "6371416" | "6373403" | "6374184" | "6377877" | "6397147" | "6421587" | "6434452" | "6456937" | "6459964" | "6459965" | "6487478").PN. OR ("6863246"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 15:58
L9	2	("6434452").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/06/02 15:58

L10	53	("20010056544" | "20020070879" | "4181943" | "4306694" | "4459668" | "4561057" | "4711418" | "4728063" | "4886226" | "5072900" | "5129605" | "5145131" | "5177685" | "5332180" | "5340062" | "5364047" | "5394333" | "5398894" | "5452870" | "5470034" | "5529267" | "5533695" | "5620155" | "5699986" | "5740547" | "5743495" | "5751569" | "5803411" | "5828979" | "5867122" | "5944768" | "5950966" | "5978718" | "5995881" | "6049745" | "6081769" | "6102340" | "6135396" | "6179252" | "6218961" | "6311109" | "6322025" | "6345233" | "6371416" | "6373403" | "6374184" | "6377877" | "6397147" | "6421587" | "6456937" | "6459964" | "6459965" | "6487478").PN. OR ("6845953"). URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 16:17
L11	42	L10 and switch	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 16:17
L12	12	L11 and (track adj switch)	US-PGPUB; USPAT; USOCR	OR	ON	2005/06/02 16:17

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 06/20/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 06/20/2005

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

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Christine M. Behncke	3661	

-- 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 MONTH(S) 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 the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- 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 *30 March 2005*.

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

3)☐ 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

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2-14,16-29,31-44,46 and 48-70* is/are allowed.

6)☒ Claim(s) *1,15,30 and 47* is/are rejected.

7)☒ Claim(s) *45* is/are objected to.

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

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 October 2002* 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendments and Remarks filed 30 March 2005, in which claims 1-70 were presented.

Specification

2. The disclosure is objected to because of the following informalities:

Page 5, line 3 element "map database 140" was previously assigned reference number 130, Figure 1.

Page 10, line 6 element "event recorder 140" is not illustrated in Drawings.

Appropriate correction is required.

Claim Objections

3. **Claim 45** is objected to because of the following informalities: line 4: "a weight of the train. track." Appropriate correction is required.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 15, 30, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Petit et al., US Patent No. 5,092,544, in view of Polivka et al., US Patent No. 6,459,965.

5. (**Claims 1, 15, 30 and 47**) Petit discloses a system and method for controlling a train comprising: a control unit (CPU 58); and a transceiver (radio 64), the transceiver being located on the train and being in communication with the control unit (Figure 2); wherein the control unit is configured to perform the steps of transmitting an interrogation message from the train to a configurable device near the train (Column 4, lines 27-38); listening for a response from the configurable device, the response including a configuration of the configurable device (Column 5, lines 41-44 and Column 7, lines 53-57); allowing the train to continue if a response with a correct configuration is received within a period of time (Column 6, lines 23-36 and lines 1-7); and stopping the train otherwise (Column 6, lines 1-7). Petit further discloses if no response is received or is a response with an incorrect configuration is received, activating a warning device to provide a warning to a train operator (Column 6, lines 1-7 and 30-32); stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time (Column 6, lines 1-7 and 30-36); and if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received (Column 6, lines 1-7 and Column 8, lines 45-50).

Petit discloses the use of a radio-based control system for the control of wayside equipment such as track switches, but does not disclose communication between the train and a switch device. However, Polivka et al. teaches a system and method of guiding a train over a track layout comprising an onboard computer and a server. Wherein the computer and server are in communication, via mobile radio network, with various wayside devices including guideway switches, turnouts, signal, and occupancy detection circuits. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Petit with the teachings of Polivka et al. because, as Polivka et al. describes, the wayside equipment physically displays signals that are interpreted by the crew of a train and are such subject to human error through confusion, inattention, or inclement weather conditions. Whereas implementing an automatic computer controlled device would increase safety and efficiency.

Allowable Subject Matter

6. **Claims 2-14, 16-29, 31-44, 46, 48-70** are allowed.

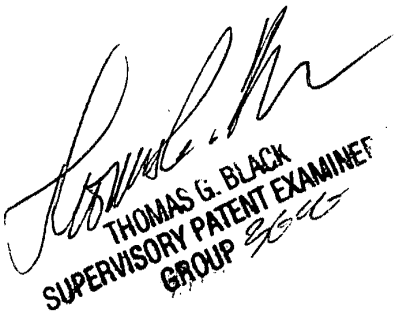
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine M. Behncke whose telephone number is (571) 272-8103. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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).

06-02-2005



Notice of References Cited	Application/Control No. 10/267,959	Applicant(s)/Patent Under Reexamination KANE ET AL.	
	Examiner Christine M. Behncke	Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,092,544	03-1992	Petit et al.	246/126
	B	US-6,459,965	10-2002	Polivka et al.	701/19
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/267,959	KANE ET AL.
Examiner	**Art Unit**
Christine M. Behncke	3661

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date
Final	Original	6/2/05
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	2	=
	3	=
	4	=
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Claim		Date
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Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Christine M. Behncke	3661	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST Text Search Update	6/2/2005	CMB

3661

DLA PIPER RUDNICK GRAY CARY US LLP
1200 NINETEENTH STREET, NW
WASHINGTON, DC 20036-2412
TELEPHONE: 202-861-3900
FACSIMILE: 202-223-2085

DOCKET NO.: 3805-001-27

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE, et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3661
Examiner: Christine M. Behncke

SIR:

Attached hereto for filing are the following papers:

Amendment

Our check in the amount of $0.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

DLA PIPER RUDNICK GRAY CARY US LLP

James M. Heintz
Registration No.: 41,828

05/05

DOCKET NO. 3805-001-27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:	Mark Edward KANE, et al.	ART UNIT:	3661
SERIAL NO.:	10/267,959	EXAMINER:	Christine M. Behncke

FILING DATE: October 10, 2002

FOR: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

SIR:

Responsive to the outstanding Office Action dated June 20, 2005, entry of the following amendments is respectfully requested.

IN THE CLAIMS

1. (Cancelled)

2. (Previously Presented) The system of Claim 4, wherein the device is a grade crossing gate.

3. (Previously Presented) The system of Claim 4, wherein the device is a switch.

4. (Previously Presented) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the device ;

allowing the train to continue if a response with a correct configuration is received within a period of time; and

stopping the train otherwise;

wherein the control unit is further configured to perform the step of confirming that the identifier received in the response corresponds to the device to which the interrogation message was directed.

5. (Previously Presented) The system of Claim 4, wherein the interrogation message includes an identifier of a device for which the interrogation message is intended.

6. (Previously Presented) The system of Claim 4, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identifier from the database associated with the device identified in the identifying step.

7. (Original) The system of Claim 6, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

8. (Original) The system of Claim 7, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

9. (Original) The system of Claim 7, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

10. (Original) The system of Claim 9, wherein the threshold is further based on a weight of the train.

11. (Original) The system of Claim 9, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

12. (Original) The system of Claim 11, wherein the threshold is further based on distribution of weight in the train.

13. (Previously Presented) The system of Claim 4, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

14. (Original) The system of Claim 13, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

15. (Cancelled)

16. (Previously Presented) The method of Claim 19, wherein the device is a grade crossing gate.

17. (Previously Presented) The method of Claim 19, wherein the device is a switch.

18. (Previously Presented) The method of Claim 15, further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing an actual direction of the switch to a desired direction of the switch based on the route information.

19. (Previously Presented) A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the configurable device;

confirming that the identifier received in the response corresponds to the configurable device to which the interrogation message was directed;

allowing the train to continue if a response with a correct configuration is received; and

stopping the train otherwise.

20. (Previously Presented) The method of Claim 19, wherein the interrogation message

includes an identifier of a device for which the interrogation message is intended.

21. (Previously Presented) The method of Claim 19, further comprising the steps of:

identifying a configurable device in a database which is a next device which the train will pass based on information from a positioning system located on the train; and

obtaining an identifier associated with the device identified in the identifying step from the database.

22. (Original) The method of Claim 21, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

23. (Original) The method of Claim 22, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

24. (Original) The method of Claim 22, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

25. (Original) The method of Claim 24, wherein the threshold is further based on a weight of the train.

26. (Original) The method of Claim 24, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

27. (Original) The method of Claim 26, wherein the threshold is further based on distribution of weight in the train.

28. (Previously Presented) The method of Claim 19, further comprising the step of activating a warning device when a response with a correct configuration is not received.

29. (Original) The method of Claim 28, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

30. (Cancelled)

31. (Previously Presented) The system of Claim 33, wherein the device is a grade crossing gate.

32. (Previously Presented) The system of Claim 33, wherein the device is a switch.

33. (Previously Presented) A system for controlling a train, the system comprising:

a control unit; and

a transceiver, the transceiver being located on the train and being in communication with the control unit;

wherein the control unit is configured to perform the steps of

transmitting an interrogation message to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier associated with the configurable device;

allowing the train to continue if a response with a correct configuration is received;

if no response is received or if a response with an incorrect configuration is received,

activating a warning device to provide a warning to a train operator;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the device is acceptable has been received;

wherein the control unit is further configured to perform the step of confirming that identifier received in the response corresponds to the device to which the interrogation message

was directed.

34. (Previously Presented) The system of Claim 33 , wherein the interrogation message includes an identifier of a device for which the interrogation message is intended.

35. (Previously Presented) The system of Claim 33, further comprising:

a positioning system, the positioning system being in communications with the control unit and being configured to provide position information to the control unit; and

a database, the database including a plurality of locations for a plurality of configurable devices;

wherein the control unit is further configured to perform the steps of

identifying a configurable device in the database which is a next device which the train will pass based on information from the positioning system; and

obtaining an identifier from the database associated with the device identified in the identifying step.

36. (Original) The system of Claim 35, wherein the control unit is configured to transmit the interrogation message when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

37. (Original) The system of Claim 35, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

38. (Original) The system of Claim 35, wherein the threshold is determined dynamically based at least in part upon the current speed of the train.

39. (Original) The system of Claim 38, wherein the threshold is further based on a weight of the train.

40. (Original) The system of Claim 38, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

41. (Original) The system of Claim 40, wherein the threshold is further based on distribution of weight in the train.

42. (Previously Presented) The system of Claim 33, further comprising a warning device connected to the control unit, wherein the control unit is further configured to activate the warning device when a response with a correct configuration is not received.

43. (Original) The system of Claim 42, wherein the control unit is further configured to perform the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

44. (Previously Presented) The system of Claim 33, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

45. (Currently Amended) The system of Claim 33, further comprising a positioning system in communication with the control unit and located on the train, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a weight of the train. ~~track.~~

46. (Original) The system of Claim 45, further comprising a track database in communication with the control unit, wherein the period of time is further based on a grade of a section of track between the train and the device.

47. (Cancelled)

48. (Previously Presented) The method of Claim 50, wherein the device is a grade crossing gate.

49. (Previously Presented) The method of Claim 50, wherein the device is a switch.

50. (Previously Presented) A method for controlling a train comprising the steps of:

transmitting an interrogation message from the train to a configurable device near the train;

listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the configurable device;

allowing the train to continue if a response with a correct configuration is received and the identifier received in the response corresponds to the device to which the interrogation message was directed.

if a response with a correct configuration and an identifier corresponding to the configurable device to which the interrogation message was directed is not received, or if no response is received;

activating a warning device to provide a warning;

stopping the train if an acknowledgment of the warning is not received or if a speed of the train is not reduced within a period of time; and

if an acknowledgment of the warning is received within the period of time, maintaining the speed until the device has been passed or a verification that passing the configurable device is acceptable has been received.

51. (Previously Presented) The method of Claim 50, wherein the interrogation message includes an identifier of a device for which the interrogation message is intended.

52. (Previously Presented) The method of Claim 50, further comprising the steps of:

identifying a configurable device in the database which is a next device which the train will pass based on information from a positioning system; and

obtaining an identifier associated with the device identified in the identifying step from a

database.

53. (Original) The method of Claim 52, wherein the interrogation message is transmitted when a distance between the train's location and the configurable device identified in the identifying step is below a threshold.

54. (Original) The method of Claim 52, wherein the threshold is a predetermined number based at least in part on an expected worst case distance required to stop the train.

55. (Original) The method of Claim 52, further comprising the step of calculating the threshold based at least in part upon the current speed of the train.

56. (Original) The method of Claim 55, wherein the threshold is further based on a weight of the train.

57. (Original) The method of Claim 55, wherein the database further includes a grade of a track between the train and the device and the threshold is further based on the grade of the track between the train and the device.

58. (Original) The method of Claim 57, wherein the threshold is further based on distribution of weight in the train.

59. (Previously Presented) The method of Claim 50, further comprising the step of activating a warning device when a response with a correct configuration is not received.

60. (Original) The method of Claim 59, further comprising the step of preventing the train from moving until an acknowledgment of the activated warning device has been received.

61. (Previously Presented) The method of Claim 50, wherein the period of time is based on a worst- case assumption that the train is traveling at a maximum speed and weighs a maximum amount.

62. (Previously Presented) The method of Claim 50, wherein the period of time is based on an actual speed of the train based on information reported by the positioning system and a

weight of the train.

63. (Original) The method of Claim 62, wherein the period of time is further based on a grade of a section of track between the train and the device.

64. (Original) The method of Claim 63, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether a configuration received from the switch is correct by comparing a direction of the switch to a desired direction of the switch based on the route information.

65. (Previously Presented) A method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and an identifier of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identifier of the next configurable device;

waiting a period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the period of time;

if the response is received, comparing an identifier included in the response to the identifier of the next configurable device;

stopping the train if a response from the device indicates that the device is not properly configured or if a response is not received within the period of time.

66. (Original) The method of Claim 65, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

67. (Original) The method of Claim 65, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and

determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

68. (Previously Presented) A computerized method for controlling a train comprising the steps of:

obtaining a position of a train from a positioning system;

determining a location and identifier of a next configurable device that will be passed by the train from a database;

sending an interrogation message including the identifier of the next configurable device;

waiting a first period of time based in part on a speed and a weight of the train and a grade of a section of track between the train and the device;

listening for a response during the first period of time;

if the response is received, comparing an identifier included in the response to the identifier of the next configurable device;

providing a warning to an operator if a response from the device indicates that the device is not properly configured or if a response is not received within the first period of time;

stopping the train if the operator does not acknowledge the warning and slow the train to a reduced speed within a second period of time; and

if the warning is acknowledged and the reduced speed is achieved within the second period of time, maintaining the reduced speed until the operator verifies that the device is configured properly or until the train has passed the device;

69. (Original) The method of Claim 68, further comprising the step of transmitting a command to the next configurable device, the command instructing the next configurable device to assume a proper configuration.

70. (Original) The method of Claim 68, wherein the configurable device is a switch and further comprising the steps of storing route information from a dispatcher in a memory and determining whether the switch is properly configured by comparing a direction of the switch to a desired direction of the switch based on the route information.

REMARKS

Applicants gratefully acknowledge the allowance of Claims 2-14, 16-29, 31-44, 46 and 48-70.

Claim 45 was objected to due to a formality. Claim 45 has been amended. Withdrawal of the rejection is respectfully requested.

Claims 1, 15, 30 and 47 have been cancelled without prejudice to their underlying subject matter. Applicants reserve the right to pursue the subject matter of these claims in this or any other application. Accordingly, the only currently pending claims have been allowed.

In light of the above, Applicants submit that this application is now in condition for allowance and therefore request favorable consideration. If any issues remain which the Examiner feels may be best resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact Applicants counsel, James M. Heintz at (202) 861-4167.

Respectfully submitted,

DLA PIPER RUDNICK GRAY CARY US LLP

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1200 Nineteenth Street, N.W.
Washington, D.C. 20036-2412
Telephone No. (202) 861-3900
Facsimile No. (202) 223-2085

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

10/267,959

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	150.00	OR	BASIC FEE	300.00
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL		OR	TOTAL	

amdt. 3-30-05

CLAIMS AS AMENDED - PART II

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Independent	* 10	Minus	*** 06	= 4
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
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X$ 25=		OR	X$50=	
X100=	400.00	OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE	406.PO	OR	TOTAL ADDIT. FEE	

amdt. 8-18-05

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 65	Minus	** 70	= —
Independent	* 7	Minus	*** 10	= —
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

		OR		
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
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X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
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Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

		OR		
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
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X100=		OR	X200=	
+180=		OR	+360=	

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L2	141	L1 and (transmit or transmission or transceiv$3 or receiv$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 14:58
L3	82	L1 not L2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:04
L4	408	701/19.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:04
L5	228	L4 and (transmitting or transmitter or transceiver)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:04
L6	207	L5 and (switch or gate or grade or wayside or status)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:58
L7	21	L5 not L6	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:58
L8	31032	(train or locomotive or railcar or railroad) and (switch or cross$3 or gate or grade or direction or exchange)	US-PGPUB	OR	ON	2005/10/25 16:27
L9	23008	L8 and (message or signal or inquiry or communicat$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:00
L10	20273	L8 and (transmission or transmit$3 or receiver$3 or inquire)	US-PGPUB	OR	ON	2005/10/25 16:26
L11	5221	L10 and wireless	US-PGPUB	OR	ON	2005/10/25 16:14
L12	2849	L11 and (identifier or status)	US-PGPUB	OR	ON	2005/10/25 16:15

L13	2723	L12 and (train or locomotive)	US-PGPUB	OR	ON	2005/10/25 16:15
L14	66	L12 and ((train or locomotive) near (stop$3 or brak$3))	US-PGPUB	OR	ON	2005/10/25 16:21
L15	2368	((train or locomotive or railcar or railroad) and (switch or cross$3 or gate or grade or direction or exchange)).clm.	US-PGPUB	OR	ON	2005/10/25 16:20
L16	919	L15 and (transmission or transmit$3 or receiver$3 or inquire).clm.	US-PGPUB	OR	ON	2005/10/25 16:20
L17	19	L16 and ((train or locomotive) near (stop$3 or brak$3)).clm.	US-PGPUB	OR	ON	2005/10/25 16:21
L18	459	246/167R.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 17:39
L19	266	L18 and (transmission or transmit$3 or receiver$3 or inquire)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:27
L20	25	L19 and (switch or cross$3 or gate or grade or direction or exchange)	US-PGPUB	OR	ON	2005/10/25 16:28
L21	232	L19 and (switch or cross$3 or gate or grade or direction or exchange)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:28
L22	230	L19 and (switch or cross$3 or gate or grade or direction)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:38
L23	36	L19 not L22	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:39
L24	0	246/270.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 17:39
L25	52	246/270R.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 17:39

S1	31475	train and safety	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 09:50
S31	289469	(train or locomotive or railcar or railroad) and (switch or cross$3 or gate or grade or direction or exchange)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:00
S32	160287	S31 and (message or signal or inquiry or communicat$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 16:00
S33	61205	S32 and (processor or computer or CPU or ECU or microprocessor)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:15
S34	56868	S33 and (transmission or transmit$3 or receiv$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:16
S35	9371	S34 and safety	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:16
S36	5715	S35 and (automatic or automat$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:17
S37	243	S36 and ((train or locomotive or railroad) adj (speed or velocity))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:20
S38	181	S37 and (weight or mass or load)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 10:20
S39	51	S38 and ((train or locomotive or railroad) near (weight or mass or load))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 12:37

S40	47	("20010056544" | "20020070879" | "4181943" | "4459668" | "4561057" | "4711418" | "5072900" | "5129605" | "5177685" | "5332180" | "5340062" | "5364047" | "5394333" | "5398894" | "5452870" | "5533695" | "5620155" | "5699986" | "5740547" | "5751569" | "5803411" | "5828979" | "5867122" | "5944768" | "5950966" | "5978718" | "5995881" | "6049745" | "6081769" | "6102340" | "6112142" | "6135396" | "6179252" | "6218961" | "6311109" | "6322025" | "6345233" | "6371416" | "6373403" | "6374184" | "6377877" | "6397147" | "6421587" | "6456937" | "6459964" | "6459965" | "6487478").PN. OR ("6957131").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/10/25 11:00
S41	0	246/182.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 12:38
S42	223	246/182B.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 12:38
S43	141	S42 and (transmit or transmission or transceiv$3 or receiv$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 12:38
S44	107	S43 and (switch or gate or grade or wayside or status)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 15:05
S45	2	("6459965").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	OFF	2005/10/25 12:54
S46	17	("4711418" | "5364047" | "5398894" | "5533695" | "5828979" | "5928294" | "6049745").PN. OR ("6459965").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/10/25 13:26

S47	34	S43 not S44	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/10/25 14:58

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 11/04/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	PAPER NUMBER
3661	

DATE MAILED: 11/04/2005

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

TITLE OF INVENTION: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	02/06/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 07/05) Approved for use through 04/30/2007.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 11/04/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

TITLE OF INVENTION: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	02/06/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
BEHNCKE, CHRISTINE M	3661	701-019000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:
☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):
☐ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. 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 12 minutes to complete, including gathering, preparing, and submitting the completed application 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 11/04/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 11/04/2005

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PTOL-85 (Rev. 07/05) Approved for use through 04/30/2007.

Notice of Allowability	Application No.	Applicant(s)	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Christine M. Behncke	3661	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment and Remarks filed 18 August 2005*.

2. ☒ The allowed claim(s) is/are *2-14,16-29,31-44,46 and 48-70*.

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

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600

DETAILED ACTION

This office action is in response to the Amendment and Remarks filed 18 August 2005, in which claims 2-14, 16-29, 31-44, 46 and 48-70 were presented for examination.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with James M. Heintz (Reg. No. 41,828) on 25 October 2005.

The application has been amended as follows:

Claim 18, line 1: delete "of Claim 15" and replace in its stead --of Claim 17--.

In the Specification, page 5, line 3: delete "database 140" and replace in its stead --database 130--.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Claims 4 and 33 are allowable because the prior art of record does not disclose, teach or suggest the combination including: a control unit with a transceiver for controlling a train, wherein the control unit: transmits an interrogation message to a configurable device near the train; listens for a response from the configurable device, wherein the response includes a configuration of the configurable device and an identifier of the

device; and is configured to perform the step of confirming that the identifier received in the response corresponds to the device to which the interrogation message was directed.

Claims 19, 50, 65 and 68 are allowable because the prior art of record does not disclose, teach or suggest the combination of a method comprising of: transmitting an interrogation message from the train to a configurable device near the train; listening for a response from the configurable device, the response including a configuration of the configurable device and an identifier of the configurable device; and confirming that the identifier received in the response corresponds to the configuration device to which the interrogation message was directed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine M. Behncke whose telephone number is (571) 272-8103. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on (571) 272-6956. 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).

10-25-2005

THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600

Issue Classification	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/267,959	KANE ET AL.	
	Examiner	Art Unit	
	Christine M. Behncke	3661	

ISSUE CLASSIFICATION

ORIGINAL					CROSS REFERENCE(S)						
CLASS				SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
701				19	246	182B					
INTERNATIONAL CLASSIFICATION					701	20					
G	0	5	D	13/00	116	36					
				/							
				/							
				/							
				/							

Christine M. Behncke (10/25/05)
(Assistant Examiner) (Date)

(Legal Instruments Examiner) 11/2/5 (Date)

THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP

(Primary Examiner) 10/31/05 (Date)

Total Claims Allowed: 66

O.G. Print Claim(s)	O.G. Print Fig.
4	1

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
~~1~~	1	29	31	57	61		91		121		151		181
2	2	30	32	58	62		92		122		152		182
3	3	28	33	59	63		93		123		153		183
1	4	31	34	60	64		94		124		154		184
4	5	32	35	61	65		95		125		155		185
5	6	33	36	62	66		96		126		156		186
6	7	34	37	63	67		97		127		157		187
7	8	35	38	64	68		98		128		158		188
8	9	36	39	65	69		99		129		159		189
9	10	37	40	66	70		100		130		160		190
10	11	38	41		71		101		131		161		191
11	12	39	42		72		102		132		162		192
12	13	40	43		73		103		133		163		193
13	14	41	44		74		104		134		164		194
~~14~~	~~15~~	42	45		75		105		135		165		195
15	16	43	46		76		106		136		166		196
16	17	~~44~~	~~47~~		77		107		137		167		197
17	18	45	48		78		108		138		168		198
14	19	46	49		79		109		139		169		199
18	20	44	50		80		110		140		170		200
19	21	47	51		81		111		141		171		201
20	22	48	52		82		112		142		172		202
21	23	49	53		83		113		143		173		203
22	24	50	54		84		114		144		174		204
23	25	51	55		85		115		145		175		205
24	26	52	56		86		116		146		176		206
25	27	53	57		87		117		147		177		207
26	28	54	58		88		118		148		178		208
27	29	55	59		89		119		149		179		209
~~28~~	~~30~~	56	60		90		120		150		180		210

Search Notes

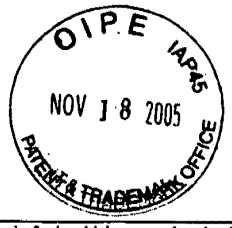
Application/Control No.	Applicant(s)/Patent under Reexamination	
10/267,959	KANE ET AL.	
Examiner	**Art Unit**	
Christine M. Behncke	3661	

SEARCHED			
Class	Subclass	Date	Examiner
246	182B	10/25/2005	CMB
701	19	10/25/2005	CMB
246	270R	10/25/2005	CMB

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
701	**19**	10/25/2005	**CMB**
246	182B	10/25/2005	CMB
246	270R	10/25/2005	CMB
USPGPub text search		10/25/2005	CMB

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST Text Search updated	10/25/2005	CMB
246/167R and text search	10/25/2005	CMB
Allowance Conference with SPE, Thomas Black	10/25/2005	CMB

PART B - FEE(S) TRANSMITTAL



Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 11/04/2005

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

TITLE OF INVENTION: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	02/06/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
BEHNCKE, CHRISTINE M	3661	701-019000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 DLA Piper Rudnick
Gray Cary US LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

11/22/2005 MBEYENE2 00000025 10267959
01 FC:1504 300.00 OP
02 FC:2501 700.00 OP

(A) NAME OF ASSIGNEE: Quantum Engineering, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Orange Park, Florida

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):
☒ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 50-1442 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date 11/18/05

Typed or printed name James M .Heintz Registration No. 41,828

This collection of information is required by 37 CFR 1.311. 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 12 minutes to complete, including gathering, preparing, and submitting the completed application 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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

DLA PIPER RUDNICK GRAY CARY US LLP
1200 NINETEENTH STREET, NW
WASHINGTON, DC 20036-2412
TELEPHONE: 202-861-3900
FACSIMILE: 202-223-2085

DOCKET NO.: 16024-10-27

ASSISTANT COMMISSIONER FOR PATENTS
PO BOX 1450
ALEXANDRIA, VA 22313-1450

Re: Serial No.: 10/267,959
Applicant(s): Mark Edward KANE et al.
Filing Date: October 10, 2002
For: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
Group Art Unit: 3661
Examiner: Christine C. Behncke

SIR:

Attached hereto for filing are the following papers:

Issue Fee Transmittal

Our check in the amount of $ 1000.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

DLA PIPER RUDNICK GRAY CARY US LLP

James M. Heintz
Registration No.: 41,828

05/05

FEE TRANSMITTAL
FY 2005

Docket No.	3805-001-27
Serial No.	10/267,959
Filing Date	October 10, 2002
Inventor(s)	Mark Edward KANE et al.
Group Art Unit	3661
Examiner	Christine C. Behncke

TOTAL AMOUNT OF PAYMENT	$1,000.00

1. ■ Applicant claims small entity status.
   ■ Charge any **UNDERPAYMENT** or credit any **OVERPAYMENT** in the indicated fees to Deposit Account No. 50-1442.
   □ Charge the indicated fees to Deposit Account No. 50-1442.
2. ■ Check enclosed.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Code	Large Entity Fee $	Small Entity Code	Small Entity Fee $	Fee Description	Fee Paid
1011	300	2011	150	Utility Fling Fee	
1012	200	2012	100	Design Filing Fee	
1013	200	2013	100	Plant Filing Fee	
1014	300	2014	150	Reissue Filing Fee	
1005	200	2005	100	Provisional Filing Fee	
1111	500	2111	250	Utility Search Fees	
1311	200	2311	100	Utility Examination Fees	
				SUBTOTAL	$0.00

2. EXTRA CLAIM FEES

tot. claims		-	20*	=	0	x	$50	=	0
ind. claims		-	3*	=	0	x	$200	=	0
□	Multiple Dependent Claims						$360	=	
							SUBTOTAL		0

3. APPLICATION SIZE FEES

Total # of Sheets		# of Extra Sheets
	- 100 =	0
# of each additional 50 sheets or fraction thereof (round up)	Fee	Total Fee Due
	x $250 =	0

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge-late filing fee or oath	
1053	130	1053	130	Non-English Specification	
1251	120	2251	60	1-mo. ext. of time	
1252	450	2252	225	2-mo. ext. of time	
1253	1020	2253	510	3-mo. ext. of time	
1254	1590	2254	795	4-mo. ext. of time	
1255	2160	2255	1080	5-mo. ext. of time	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Appeal Brief	
1403	1000	2403	500	Request for Oral	
1501	1400	2501	700	Utility/Reissue Issue	700
1504	300	1504	300	Publication Fee	300
8001	3	8001	3	Advance Copy of Patent	
1806	180	1806	180	IDS Submission	
8021	40	8021	40	Assignment Recordation	
1801	790	2801	395	For Filing RCE	
1814	130	2814	65	Terminal Disclaimer	
Other:					
				SUBTOTAL	1000

Name	James M. Heintz	Registration No.	41,828		
Signature		Date	11/18/05	Telephone	202-861-3900
Name		Registration No.			

Rev. 05/05

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27	1510

7590 01/09/2006

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

EXAMINER	
BEHNCKE, CHRISTINE M	
ART UNIT	**PAPER NUMBER**
3661	

DATE MAILED: 01/09/2006

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

PTO-90C (Rev. 10/03)

Supplemental Notice of Allowability	Application No. 10/267,959	Applicant(s) KANE ET AL.	
	Examiner Christine M. Behncke	Art Unit 3661	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment and Remarks filed 18 August 2005*.

2. ☒ The allowed claim(s) is/are *2-14, 16-29, 31-46 and 48-70*.

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

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

THOMAS G. BLACK
SUPERVISORY PATENT EXAMINER
GROUP 3600

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 28524

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 28524

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Siemens Rail Automation Corporation
2400 Nelson Miller Parkway
Louisville, KY 40223

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Kimberly E. Taylor	Date	10.7.13
Name	Kimberly E. Taylor	Telephone	502-618-8869
Title	Senior Legal Counsel - Siemens Rail Automation Corporation		

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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 displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Mark Edward Kane, James Francis Shockley, and Harrison Thomas Hickenlooper

Application No./Patent No.: 6996461 (2002P21069 US) Filed/Issue Date: 02.07.2006

Titled: METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE

Siemens Rail Automation Corporation, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: KANE, MARK EDWARD, SHOCKLEY, JAMES To: QUANTUM ENGINEERING, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 013375, Frame 0948, or for which a copy thereof is attached.

2. From: QUANTUM ENGINEERING, INC. To: INVENSYS RAIL CORPORATION

The document was recorded in the United States Patent and Trademark Office at
Reel 024128, Frame 0423, or for which a copy thereof is attached.

3. From: INVENSYS RAIL CORPORATION To: SIEMENS RAIL AUTOMATION CORPORATION

The document was recorded in the United States Patent and Trademark Office at
Reel 031217, Frame 0423, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Kimberly E. Taylor — 10.7.13

Signature — Date

Kimberly E. Taylor — Senior Legal Counsel - Siemens

Printed or Typed Name — Title

Electronic Acknowledgement Receipt	
EFS ID:	17064192
Application Number:	10267959
International Application Number:	
Confirmation Number:	1510
Title of Invention:	METHOD AND SYSTEM FOR ENSURING THAT A TRAIN DOES NOT PASS AN IMPROPERLY CONFIGURED DEVICE
First Named Inventor/Applicant Name:	Mark Edward Kane
Correspondence Address:	Supervisor, Patent Prosecution Services PIPER RUDNICK LLP 1200 Nineteenth Streett, N.W. - Washington DC 20036-2412 US 2028613900 -
Filer:	Filip Aleksander Kowalewski/Jessica Thomas
Filer Authorized By:	Filip Aleksander Kowalewski
Attorney Docket Number:	3805-001-27
Receipt Date:	08-OCT-2013
Filing Date:	10-OCT-2002
Time Stamp:	09:20:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	PoA_SiemensRail_Old.pdf	64992 0ad4a755f94c3e683d6f597021435adb2a8c5f8e	no	1
Warnings:					
Information:					
2	Assignee showing of ownership per 37 CFR 3.73.	Statement.pdf	58010 32d64e7b7e8fb1125cd8eff1d1654e888e4a301b	no	1
Warnings:					
Information:					
		Total Files Size (in bytes):	123002		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/267,959	10/10/2002	Mark Edward Kane	

CONFIRMATION NO. 1510

28524
SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

POA ACCEPTANCE LETTER

OC000000064486234

Date Mailed: 10/18/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/08/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/rmturner myles/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27

CONFIRMATION NO. 1510

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

POWER OF ATTORNEY NOTICE

OC000000064486225

Date Mailed: 10/18/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/08/2013.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/rmturner myles/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

OPA/TPD Mail
Organization
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ATTEMPTED - NOT KNOWN
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BC: 22313145050
*3017-02369-18-43

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/267,959	10/10/2002	Mark Edward Kane	3805-001-27

CONFIRMATION NO. 1510

POWER OF ATTORNEY NOTICE

Supervisor, Patent Prosecution Services
PIPER RUDNICK LLP
1200 Nineteenth Streett, N.W.
Washington, DC 20036-2412

Date Mailed: 10/18/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/08/2013.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/rmturner myles/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101