

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION,
(d/b/a WABTEC CORPORATION)
Petitioner,

v.

SIEMENS INDUSTRY, INC.,
Patent Owner.

Case IPR2017-00650
Patent 7,742,850 B2

Before KRISTEN L. DROESCH, MEREDITH C. PETRAVICK, and
TIMOTHY J. GOODSON, *Administrative Patent Judges*.

GOODSON, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Petitioner filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–14 of U.S. Patent No. 7,742,850 B2 (Ex. 1001, “the ’850 patent”). Patent Owner filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”). We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” We decide whether to institute an *inter partes* review on behalf of the Director. Upon consideration of the Petition and Patent Owner’s Preliminary Response, we do not institute an *inter partes* review of any claims of the ’850 patent.

A. Related Matters

The parties report that Patent Owner is asserting the ’850 patent against Petitioner in *Siemens Industry, Inc. v. Westinghouse Air Brake Tech. Corp.*, Case No. 1-16-cv-00284 in the U.S. District Court for the District of Delaware. Pet. 13; Paper 4, 2; Paper 6, 1. In addition, the parties identify one Board proceeding as a related matter: Case IPR2017-00582, which concerns U.S. Patent No. 7,467,032. Paper 4, 2; Paper 6, 1.

B. The ’850 Patent

The ’850 patent relates to a “method for keeping track of end of train units.” Ex. 1001, 1:16–18. According to the Background of the ’850 patent, “end of train (EOT) units are typically attached at the rear of the last car on a train” and can perform various functions, including monitoring pressure in the air brake pipe and transmitting that information to the head of the train (HOT). *Id.* at 1:20–25. EOT units can also accept a command from the HOT to open the air brake pipe, thereby activating the brakes to stop the

train. *Id.* at 1:26–28. EOT units can include motion detectors or GPS receivers that are used to provide motion or location information to the HOT. *Id.* at 1:29–34.

“[I]t is often necessary to install and remove EOT units from individual cars in a train yard,” such as when the train’s cars are shuffled or reformed. *Id.* at 1:47–50. EOT units that are removed are often placed by the wayside for later collection, and then become lost or temporarily misplaced. *Id.* at 1:51–54. Lost EOT units cause expense beyond the cost of the EOT unit itself because “rent must be paid for the time when an EOT unit from one railroad is in another railroad’s territory.” *Id.* at 1:54–59.

The ’850 patent seeks to address this problem by providing an EOT unit “that includes a positioning system such as a GPS receiver and that is configured to transmit a message including the EOT unit’s location” when various conditions occur, such as a loss of air pipe pressure or in response to a query from a device located off the train. *Id.* at 1:65–2:4. A transceiver in the EOT unit is capable of two-way communications with the HOT relating to various on-train functions, and can also transmit a message including location information to an EOT monitoring station located off the train. *Id.* at 2:4–6, 4:45–63.

C. Challenged Claims

Petitioner challenges claims 1–14. Claims 1 and 8 are independent claims. Claim 1 is reproduced below, with bracketed labels as added by Petitioner to facilitate reference to particular elements:

1. A method for end of train unit operation comprising the steps of:
 - [a] transmitting a first wireless message from an end of train unit-to an end of train unit-monitoring station located off of any

train, the first wireless message including a location of the end of train unit and an identifier that uniquely identifies the end of train unit, the end of train unit including an end of train marker light and a pressure sensor configured to determine air pressure in an air brake pipe;

- [b] receiving the first message including the location of the end of train unit at the end of train unit monitoring station;
- [c] transmitting the location of the train the end of train unit from the end of train unit monitoring station to a central authority;
- [d] transmitting the location of the end of train unit from the central authority to fourth device;
- [e] receiving the location of the end of train unit at the fourth device and displaying a location of the end of train unit on a map image on a display connected to the fourth device; and
- [f] transmitting a second wireless message to a fifth device located at the head of the train, the second wireless message including an air pressure sensed by the pressure sensor.

Ex. 1001, 10:10–34; *see also* Pet. 18–19 (adding bracketed labels).

D. Alleged Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Reference	Basis	Claims Challenged
Curtis ¹ in view of Collins ² and Doner ³	§ 103	1–3, 6–12, and 14
Curtis in view of Collins, Doner, and Mays ⁴	§ 103	1–3, 6–12, and 14

¹ U.S. Patent No. 6,081,769, June 27, 2000, Ex. 1005.

² U.S. Patent App. Pub. No. 2002/0004693 A1, Jan. 10, 2002, Ex. 1006.

³ U.S. Patent App. Pub. No. 2001/0044695 A1, Nov. 22, 2001, Ex. 1018.

⁴ U.S. Patent App. Pub. No. 2002/0049520 A1, Apr. 25, 2002, Ex. 1008.

Curtis in view of Collins, Doner, Mays, and Bezos ⁵	§ 103	4, 5, and 13
Curtis in view of Collins, Doner, and Bezos	§ 103	4, 5, and 13

See Pet. 18. In addition to the references listed above, Petitioner relies on the declaration of Steven R. Ditmeyer (Ex. 1002).

II. ANALYSIS

A. Claim Construction

We interpret the claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, a claim term generally is given its ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. See *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). For the purposes of this decision, resolution of the disputed issues does not require an express interpretation of any claim term. See *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

B. Obviousness Ground Based on Curtis in view of Collins and Doner

1. Summary of Curtis

Curtis describes a method and apparatus for determining the length of a train. Ex. 1005, at (54), (57), 1:8–9. Curtis explains that safe operation of a train requires knowledge of its length so that an operator can assess

⁵ U.S. Patent No. 5,267,473, Dec. 7, 1993, Ex. 1009.

whether the train has cleared a point on the track. *Id.* at 1:10–14. Figure 1 of Curtis is reproduced below:

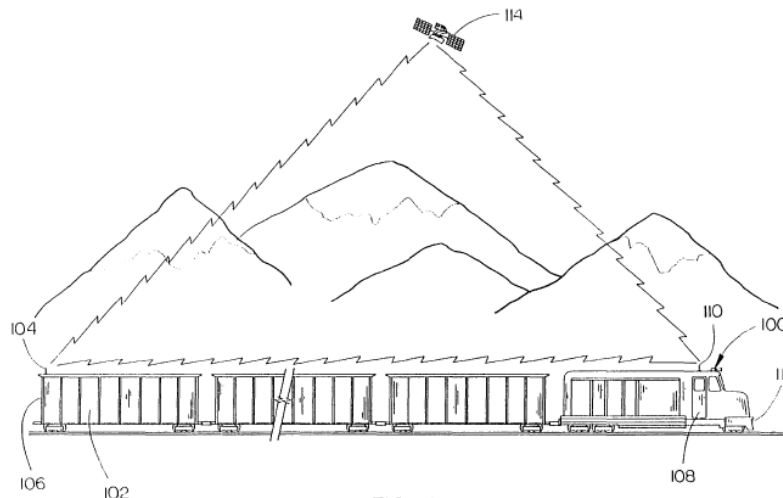


Figure 1 depicts train 100 having a system for determining the length of the train. *Id.* at 2:62–64. First receiver 104 on end car 102 receives a signal from satellite 114 operating as part of a Global Positioning System. *Id.* at 2:67–3:5, 3:35–40. Based on that signal, a geo-referenced end-of-train position for end of train 106 is determined. *Id.* at 3:3–5. Second receiver 110 on front locomotive 108 also receives a signal from the GPS and determines a geo-referenced front-of-train position for the front of the train 112. *Id.* at 3:5–10. First receiver 104 communicates the first position to a processor via second receiver 110, and the processor calculates the length of train 100 based on the first and second positions. *Id.* at 3:10–17.

2. Summary of Collins

Collins relates to monitoring the radio transmissions of End of Train devices and Head of Train devices and tracking the locations of such devices. Ex. 1006 ¶ 3. Collins explains that radio transceivers in HOT and EOT devices transmit operational messages to each other for testing, “control of the EOT device by the HOT device, and the transmission of

status information from the EOT device to the HOT.” *Id.* ¶ 8. Collins further describes that “when a train carrying the EOT device of one company reaches a destination within the rail network of another company, the EOT device is removed and replaced by an EOT belonging to the company of the network being traversed.” *Id.* ¶ 12.

These practices lead to frequent loaning or renting of EOT devices among different railroad companies, but the rental fees become substantial “when an EOT device becomes ‘lost’ or cannot readily be returned to its owner.” *Id.* “Accordingly, it would be beneficial to have a system that could locate EOT devices and automatically provide a message including return instructions . . . to railway personnel at each successive stop made by the EOT bearing train.” *Id.* Figure 4 of Collins is reproduced below:

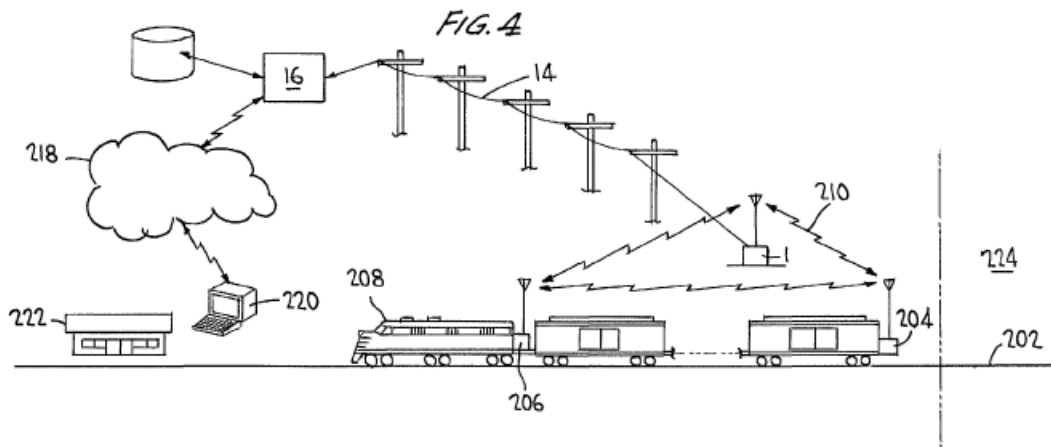


Figure 4 is a schematic view of an apparatus for tracking EOT device 204 entering from a foreign system and providing return instructions to railway personnel. *Id.* ¶ 29. Wayside monitoring unit 1 proximate railroad tracks 202 monitors radio transmissions 210 between EOT device 204 and HOT device 206 of train 208. *Id.* ¶ 58. Transmissions 210 include unique identifying information for EOT device 204, which wayside monitoring unit 1 receives and transmits via communication link 14 to central unit 16 along

with location information for wayside monitoring station 1. *Id.* “Central unit 16 then cross references the wayside location information and the EOT identification code with available EOT device ownership lists and train schedules.” *Id.* Based on that information, central unit 16 generates a message containing return instructions for EOT device 204 and transmits that message to user interface 220 for railway personnel at scheduled stop 222 of train 208. *Id.*

3. *Summary of Doner*

Doner is entitled “Methods and Apparatus for Locomotive Tracking.” Ex. 1018, at [54]. Doner describes that tracking systems in the prior art may leave the location of locomotives unknown for long periods of time. *Id.* ¶ 3. Wayside automatic equipment identification employed by some railroads provide minimal position data and are expensive. Doner seeks to address the need for cost-effective tracking of locomotives. *Id.* Relevant to Petitioner’s challenge, Doner describes a data center that can permit access via the internet to data related to a locomotive’s location. *Id.* ¶ 45. “[T]he data may be used to geographically display location of a locomotive on a map.” *Id.*

4. *Summary of Rosencrance*

Rosencrance⁶ is a news article describing the use of GPS technology in the railroad industry. Rosencrance reports that railroad companies are “experimenting with satellite-based monitoring systems.” Ex. 1007, 24.

⁶ Linda Rosencrance, *Railroads Hot for Satellite Monitoring*, COMPUTERWORLD, Apr. 3, 2000, at 24, Ex. 1007. Although Petitioner’s heading for this ground does not include Rosencrance as an asserted reference, Petitioner argues in support of this ground that Rosencrance provides a motivation to combine Curtis and Collins. See Pet. 35–37. Thus, we summarize Rosencrance here to facilitate understanding of Petitioner’s arguments in this ground.

One such system uses monitoring sensors placed on freight cars “to detect potentially damaging events such as theft or break-ins.” *Id.* Rosencrance explains that “[t]he system sends the information via satellite to the railroad operating manager, private car owner or shipper. The satellite link provides interactive communication, allowing the owner or operator of a railcar to ask about location, load status and performance via the Internet or [the] internal systems [of the rail company employing the system].” *Id.* However, according to Rosencrance, “critics abound.” *Id.* Some in the industry “say GPS is unnecessary and a waste of money because the industry already uses the land-based Automatic Equipment Identification (AEI) system to monitor the whereabouts of equipment.” *Id.* In the AEI system, “railcars and locomotives have tags that send information to the railroads as the tags pass AEI readers, which are usually placed at major intersections.” *Id.*

5. Discussion

Petitioner argues that the subject matter of claim 1 would have been obvious over Curtis in view of Collins and Doner. *See* Pet. 34–50. Petitioner asserts that the combination of Curtis and Collins discloses step [a]. *Id.* at 41–43. Specifically, Petitioner asserts that Curtis teaches an EOT unit that transmits GPS position information to the HOT. *Id.* at 41–42. In Petitioner’s proposed combination, Collins’s wayside monitoring unit 1 monitors communications from the EOT that include the content of outgoing messages from Curtis’s EOT unit. *Id.* at 43. Further, Petitioner asserts that Collins teaches that the EOT has a unique identification number that is used for communications with it. *Id.* Petitioner asserts that Curtis’s EOT unit includes a marker light and pressure sensor, features that EOT units have long included. *Id.* at 42. Thus, Petitioner argues that the proposed

combination discloses all of the features of step [a].

Regarding step [b], Petitioner argues that Collins's wayside monitoring unit 1 corresponds to the claimed "end of train monitoring station." *Id.* at 43–44. Petitioner contends that "when the wayside unit 1 of *Collins* monitors communications from the EOT that include the content of the outgoing messages of *Curtis*, the combination discloses this claim limitation." *Id.* at 44. Similarly, Petitioner asserts that when Collins's monitoring unit 1 monitors communications that include the content of Curtis's outgoing messages, the combination would satisfy step [c] when that information is transmitted from wayside monitoring unit 1 to central unit 16 and would satisfy step [d] when that information is transmitted from central unit 16 to user interface 220. *Id.* at 44–46. Petitioner relies on Doner as teaching displaying a location on a map image as recited in step [e]. *Id.* at 48. Petitioner asserts that both Curtis and Collins teach transmitting a message to the HOT that includes air pressure, as recited in step [f]. *Id.* at 49–50.

Petitioner further argues that a skilled artisan would have been motivated to combine Curtis, Collins, and Doner. *See id.* at 34–40. Specifically, Petitioner argues that the similarities in architecture and capability would have motivated those of skill in the art to consider Curtis with Collins. *Id.* at 35. Petitioner also argues that Rosencrance evidences a motivation in the industry to combine Curtis and Collins. *Id.* at 35–37. According to Petitioner, a motivation exists when there is a known need with an obvious solution, and it was known that a need existed to track EOT units, both to maintain control and to know where the last car of a train is located. *Id.* at 39. Concerning Doner, Petitioner argues that "combining

Doner's disclosure of displaying a map with *Collins* and *Curtis* merely reflects the specific disclosure of a functionality that a POSA would have known would have been present in the combined system.” *Id.* at 40.

Patent Owner challenges Petitioner's arguments concerning a motivation to combine. Prelim. Resp. 24–27. Concerning similarity in architecture, Patent Owner argues that “the only similarity is that both involve transmitting information from an EOT unit to an HOT unit on a train.” *Id.* at 25. Regarding *Rosencrance*, Patent Owner avers that *Curtis* already includes GPS, so “*Rosencrance* would not have led a person of skill in the art to look to other references, let alone to *Collins*, which does not use GPS positioning at all.” *Id.* at 27.

Apart from attacking Petitioner's motivation arguments, Patent Owner also contends that:

the asserted combination does not result in an EOT unit that is configured to *both*: (i) ‘transmit[] a first wireless message from an end of train unit-to an end of train unit-monitoring station located off of any train, the first wireless message including a location of the end of train unit,’ and (ii) ‘transmit[] a second wireless message to a fifth device located at the head of the train, the second wireless message including an air pressure,’ as claim 1 expressly requires.

Id. at 28. In *Collins*, wayside monitoring station 1 eavesdrops on communications between EOT and HOT. *Id.* at 29 (citing Ex. 1006 ¶ 58). In Patent Owner's view, this is different than the method of claim 1, which “does not recite a single transmission by an EOT unit that is received by two different recipients. Rather, it recites two distinct transmissions by the EOT unit: one to the HOT unit on the train, and a second one to the EOT unit monitoring station located off the train.” *Id.* at 28–29. In addition, Patent Owner argues that

[s]ince the monitoring station of *Collins* is reliant upon the ability to intercept transmissions from an EOT unit to an HOT unit, when there are no such transmissions to intercept – such as when an EOT unit has been removed from a train, and thus is not communicatively linked with an HOT unit – *Collins* has no ability to locate the EOT unit.

Id. at 30 (citing Ex. 1006 ¶ 41, Fig. 3).

We agree with Patent Owner that Petitioner has not shown a sufficient reason why an ordinarily skilled artisan would combine the references in the manner recited in claim 1. An obviousness analysis based on a combination of references must be supported by a reason to combine that is based on rational underpinnings. *See In re Nuvasive, Inc.*, 842 F.3d 1376, 1382 (Fed. Cir. 2016); *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited with approval in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)).

The requirement of a reason to combine is a safeguard against hindsight bias, which is characterized by the “temptation to read into the prior art the teachings of the invention in issue.” *KSR*, 550 U.S. at 421 (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 36 (1966)); *Translogic*, 504 F.3d at 1260 (“[A]s the Supreme Court suggests, a flexible approach to the TSM test prevents hindsight and focuses on evidence before the time of invention, without unduly constraining the breadth of knowledge available to one of ordinary skill in the art during the obviousness analysis.”) (internal citation omitted); *see also InTouch Technologies, Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014) (finding that testimony did not articulate reasons to combine and improperly used the challenged patent as a roadmap); *ActiveVideo Networks, Inc. v. Verizon Commc’ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (“[T]he expert’s testimony on obviousness was essentially a conclusory statement that a

person of ordinary skill in the art would have known, based on the ‘modular’ nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions. This is not sufficient and is fraught with hindsight bias.”).

Here, Petitioner’s obviousness case against claim 1 appears to be based on improper hindsight reasoning because the asserted motivations do not provide a sufficient reason supported by rational underpinnings for combining the references in the claimed manner. Petitioner’s argument regarding the similarity of architecture and capabilities in Curtis and Collins (Pet. 35) is unpersuasive because Petitioner does not explain what similarities would have provided a reason to combine those references in the claimed manner. We note that the question of whether prior art references qualify as analogous art is a separate issue from whether there is a motivation to combine those references. *See Wyers v. Master Lock Co.*, 616 F.3d 1231, 1237–39 (Fed. Cir. 2010). Petitioner’s asserted similarities between Curtis and Collins go to the analogous art issue but do not establish a reason to combine the references as claimed.

Petitioner’s motivation argument based on Rosencrance is also unpersuasive. According to Petitioner, Rosencrance demonstrates that incorporating GPS into train cars for tracking purposes was known, and that because railcars can be separated from locomotives, it is better to incorporate tracking technology on railcars. Pet. 35 (citing Ex. 1007, 24). Because incorporating GPS into EOT units provides greater accuracy in EOT unit monitoring, Petitioner contends that a motivation exists for combining GPS messages between the EOT and HOT (as in Curtis) with monitoring stations (as in Collins). *Id.* at 36 (citing Ex. 1002 ¶ 105). Yet

Petitioner's analysis does not explain why Rosencrance would motivate combining Curtis and Collins in the claimed manner.

Rosencrance describes that GPS systems being developed for monitoring railcars were viewed as alternative, competing technologies to existing AEI systems in which tags on railcars and locomotives send information to AEI readers placed at major railroad intersections. *See* Ex. 1007, 24. Collins's network connecting wayside monitoring unit 1 and central station 16 appears to be an example of an AEI system such as Rosencrance refers to insofar as it is a land-based network in which wayside monitoring unit 1 is positioned proximate to railroad tracks, preferably "along a heavily traveled corridor to detect signals emitted by EOT 204 passing nearby." Ex. 1006 ¶¶ 58–59, Fig. 4.

Rosencrance notes that some railroad industry analysts "say GPS is unnecessary and a waste of money because the industry already uses the land-based Automatic Equipment Identification (AEI) system to monitor the whereabouts of equipment." *Id.*; *see also id.* (reporting the comments of another analyst that GPS is good technology in theory but it is not financially viable because railroads are already accomplishing what they want to accomplish by using AEI technology). Rather than suggesting that GPS could be combined with or incorporated into the land-based systems, Rosencrance indicates that "GPS may one day replace AEI." *Id.*; *see also id.* (quoting industry critic of GPS as stating, "[w]hile GPS is a good idea, . . . [t]he railroads would have to be presented with a strong business plan if they [are to be convinced to replace the AEI] system that is only 10 years old").

Petitioner does not point to, and we do not find, any indication in Rosencrance that some elements of a GPS system could or should be incorporated into systems having a wayside monitoring unit such as Collins teaches. Instead, Rosencrance describes GPS and AEI as two alternative technologies, each having its own advantages and disadvantages. While one of the advantages Rosencrance describes for a satellite-based GPS system is its accuracy or its potential to provide greater accuracy in the future, there is no apparent reason why a skilled artisan reviewing Rosencrance interested in enhanced accuracy would combine some features of a GPS system with other features of a land-based monitoring systems, as Petitioner proposes. Instead, Rosencrance teaches that greater accuracy can be achieved, albeit at significant expense, by employing GPS technology in lieu of existing land-based AEI technology. Stated differently, Petitioner does not provide any persuasive reason why an ordinarily skilled artisan seeking to achieve enhanced accuracy via GPS monitoring as taught in Rosencrance would employ wayside monitoring stations as taught in Collins.

Thus, Petitioner does not articulate a reason why a skilled artisan reviewing Curtis, Collins, and Rosencrance would have sought to combine the various teachings of those references in the manner Petitioner proposes. In our view, Petitioner's analysis improperly selects features from the references to arrive at the claimed configuration based on hindsight, without considering the teachings of the references as a whole. *See In re Hedges*, 783 F.2d 1038, 1041 (Fed. Cir. 1986) ("It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to

one of ordinary skill in the art.”); *In re Mercier*, 515 F.2d 1161, 1166 (CCPA 1975) (reversing an obviousness rejection that improperly “rel[ie]d on isolated teachings of the prior art without considering the over-all context within which those teachings are presented”).

Petitioner’s remaining arguments concerning motivation to combine are also unpersuasive. Petitioner argues that

[b]y combining the known transmission of a message including the location of an EOT device from the EOT device to a HOT device, as disclosed by *Curtis*, with the known monitoring of transmissions between end of train units and head of train units, as disclosed by *Collins*, a person of skill in the art would have recognized that the art teaches a single system that includes an EOT monitoring station for monitoring the transmission of a location message sent from an EOT, where the EOT monitoring station routes the information to a central authority.

Pet. 38–39. This amounts to an argument that the individual elements of the claim were known and that combining them would have yielded the claimed invention, but Petitioner does not explain *why* an ordinarily skilled artisan would have combined those elements in the claimed manner. *See KSR*, 550 U.S. at 418 (“[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.”).

Finally, Petitioner argues that “[i]t was known that a need existed to track EOT units, and to know where the last car of a train is located. The combined disclosure of *Curtis* and *Collins* teach a system that is capable of solving the problem addressed in the ’850 Patent.” Pet. 39 (citing Ex. 1002 ¶ 107). Petitioner’s analysis suggests improper hindsight because it begins with the problem addressed in the ’850 patent and considers whether the combined references are capable of solving that problem. Yet “an invention

can often be the recognition of a problem itself.” *Leo Pharmaceutical Prods., Ltd. v. Rea*, 726 F.3d 1346, 1353 (Fed. Cir. 2013) (citing *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 1377 (Fed. Cir. 2004)). Here, as summarized above, the problem addressed by the ’850 patent is locating EOT units that have been removed from cars and left on the wayside for later collection. *See* Ex. 1001, 1:43–56. Petitioner does not point to, and we do not find, any recognition in the cited references of this particular problem. Further, Patent Owner argues, plausibly, that the proposed combination could not solve this problem because Collins’s wayside monitoring station eavesdrops on communications between EOT and HOT, such that the monitoring station would be unable to locate an EOT unit that is not communicatively linked with an HOT. Prelim. Resp. 30 (Ex. 1006 ¶ 41).

Because Petitioner has not articulated a sufficient reason to combine supported by rational underpinnings, Petitioner has not shown a reasonable likelihood of prevailing in showing that claim 1 would have been obvious over Curtis in view of Collins and Doner. Petitioner’s challenge to claim 8 relies on the same motivation to combine arguments as just discussed. *See* Pet. 34 (presenting the motivation to combine arguments as applicable to all claims challenged in this ground). Thus, Petitioner also has not shown a reasonable likelihood of prevailing in its challenge to claim 8. Petitioner also has not shown a reasonable likelihood of prevailing in its obviousness challenge of any of claims 2, 3, 6, 9–12, and 14, each of which depends from claim 1 or 8. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (“[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious.”).

C. Obviousness Ground Based on Curtis in view of Collins, Doner, and Mays

1. Summary of Mays

Mays describes that railways have not taken full advantage of real-time communications technologies. Ex. 1008 ¶ 5. Mays seeks to realize the benefits of real-time tracking of equipment and inventory and fill a need for “real-time data collection and reporting for interconnected mobile systems, such as railways.” *Id.* Figure 1 of Mays is reproduced below:

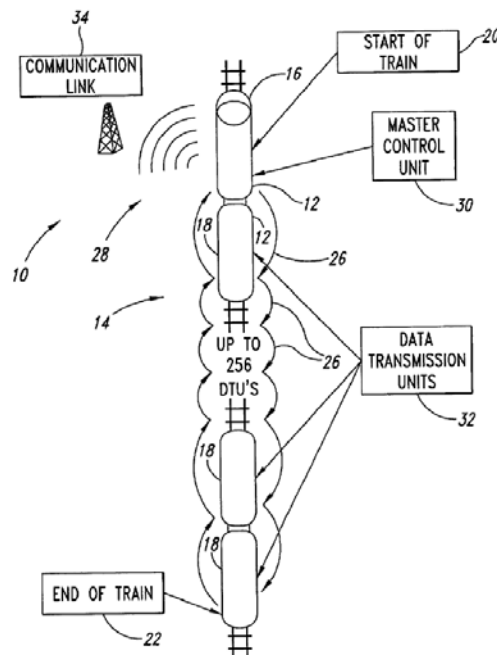


Fig. 1

Figure 1 is schematic diagram depicting wireless railway data collection and communications system 10, which collects data from railway vehicles 12 of train 14. *Id.* ¶¶ 8, 14. Railway data collection and communications system 10 includes intra-train communication system 26 and external communication system 28, which interface with one another via master control unit 30. *Id.* ¶ 15.

Intra-train communication system 26 includes master control unit 30 on locomotive 16 and data transmission units 32 on railway vehicles 12. *Id.* ¶¶ 16–17. “[E]ach of the data transmission units 32 communicate with a data transmission unit 32 carried by the adjacent railway vehicle.” *Id.* ¶ 16. Mays teaches that this “daisy-chain communications path” is low cost and provides efficient routing of data, considerations that are important for a railway communications system. *Id.*

“[M]aster control unit 30 serves as . . . the interface between the intra-train communications system 26 and the outside world.” *Id.* ¶ 19. Master control unit may use existing communications infrastructure, such as a way side communication link, a 2-way radio interface, a satellite link, or a cellular telephone interface. *Id.*

2. Discussion

Petitioner contends that claims 1–3, 6–12, and 14 would have been obvious over Curtis in view of Collins, Doner, and Mays. *See* Pet. 63–73. Petitioner explains that this ground is offered to account for the possibility that Patent Owner

may attempt to construe the “EOT unit monitoring station” broadly enough to include existing cellular infrastructure such as a cellphone tower that is not specific to a railway communications network. To the extent the claim limitations of independent claims 1 and 8, and dependent claims 2-3, 6-7, 9-12 and 14 are satisfied by transmitting messages from the EOT device to a cellular tower (i.e., a device not specifically designed for railroad communications tasks) and then further to a central station, *Mays* clarifies that one mechanism for transmitting messages from the train to the central station involves the use of already-implemented cellular communications infrastructure equipment.

Id. at 63. Petitioner’s challenge in this ground again refers back to the same motivation arguments discussed above for combining Curtis and Collins. *See id.* at 63. Those arguments are unpersuasive for the reasons discussed in Section II.B.5.

Concerning motivation to combine Mays with Curtis, Collins, and Doner, Petitioner argues that the teachings of Mays would motivate a skilled artisan “to develop a system that provided for real-time data collection in a railway system . . . using GPS and cellular communications in conjunction with an EOT device to collect real time location information of an EOT device.” Pet. 65 (citing Ex. 1002 ¶¶ 125–26). Petitioner further argues that Mays “would have motivated one skilled in the art to include cellular phone communication methods into EOT devices to further enhance the communications capabilities of EOT units with outside sources.” *Id.* (citing Ex. 1002 ¶ 118).

Petitioner argues that the combination of Curtis, Collins, Doner, and Mays discloses each limitation of claim 1. *See* Pet. 66–69. With respect to steps [c]–[f], Petitioner relies on its previously discussed arguments based on the combination of Curtis, Collins, and Doner. *See id.* at 68–69 (referring, for each of these steps, to the corresponding discussion in the previous ground and stating “[t]his limitation is obvious for the reasons already discussed”). Petitioner relies on Mays for its arguments concerning steps [a] and [b]. Specifically, Petitioner asserts that “[t]he EOT device of *Mays* is in wireless communication with the master control unit at the head of train. . . . The cellular infrastructure of *Mays* could have been incorporated into the EOT unit and the wireless message may have been transmitted directly from the EOT unit off the train.” *Id.* at 67 (citing Ex. 1002 ¶ 127). Alternatively,

Petitioner argues that sending the wireless message “from the EOT unit, along the daisy chain to the HOT, and then . . . off the train from the master control unit of *Mays*” would also satisfy step [a]. *Id.*

Petitioner’s arguments do not show that the claimed method would have been obvious based on the proposed combination. As discussed in Section II.B.5., Petitioner’s challenge based on Curtis, Collins, and Doner is unpersuasive because Petitioner does not articulate a sufficient reason why a skilled artisan would combine those reference to arrive at the claimed method, including the step of transmitting a message that includes the location of an EOT unit from the EOT unit to an off train monitoring station. The addition of Mays does not help Petitioner’s case in this regard because, as Patent Owner correctly notes, “*Mays*, like *Curtis* and *Collins*, discloses only an EOT unit that transmits information to another system located *on the train*. . . .” Prelim. Resp. 43 (citing Ex. 1008 ¶¶ 17, 24). As summarized above, the EOT in Mays communicates with data transmission unit 32 carried by the adjacent railway vehicle as part of the “daisy-chain communications path” of intra-train communication system 26. Ex. 1008 ¶ 16, Fig. 1.

Petitioner contends that the “cellular infrastructure of *Mays* **could have been** incorporated into the EOT unit and the wireless message **may have been** transmitted directly from the EOT unit off the train” (Pet. 67 (citing Ex. 1002 ¶ 127)), but that contention is speculative and lacks support in the disclosure of Mays. The paragraph from Mr. Ditmeyer’s declaration that Petitioner cites in support of this contention states as follows:

I have also been asked to review the combination of *Curtis*, *Collins*, and *Mays* as to the technical feasibility of a system where the message originates at the EOT unit and is directly sent

off the train to a receiving station without intervening routing. Based on the wireless message flow of *Collins*, I believe that *Curtis*, *Collins*, and *Mays* would lead to such a system as well.

Ex. 1002 ¶ 127. This testimony does not cite support from the references or other evidence and does not explain *why* one would arrive at a system in which a location message originates at the EOT unit and is sent directly off the train, only that it would be technically feasible to do so. As such, the testimony is not persuasive evidence that the claimed method, particularly step [a], would have been obvious to a skilled artisan based on the cited references. Accordingly, Petitioner has not shown that incorporating Mays's EOT into Curtis and Collins would yield an EOT unit that communicates with an EOT unit monitoring station located off the train.

Petitioner's alternative argument that sending the wireless message "from the EOT unit, along the daisy chain to the HOT, and then . . . off the train from the master control unit of *Mays*" would satisfy step [a] (*see* Pet. 67) is also unpersuasive. We are not persuaded that an EOT unit that communicates with the HOT via daisy chain communication path that includes only components on the train is "transmitting a first wireless message from an end of train unit-to an end of train unit-monitoring station located off of any train," as required by step [a].

Further, Petitioner does not present adequate reasoning as to why combining Mays with Curtis and Collins in the claimed manner would have been obvious. Petitioner's argument that Mays "would have motivated one skilled in the art to include cellular phone communication methods into EOT devices to further *enhance the communications capabilities of EOT units with outside sources*" (Pet. 65 (emphasis added)) is unpersuasive given that Mays itself does not teach an EOT unit that communicates with outside

sources. In Mays, master control unit 30, which is typically installed in a locomotive at the head of the train is “the interface between the intra-train communications system 26 and the outside world.” Ex. 1008 ¶¶ 17, 19.

For these reasons, Petitioner has not shown a reasonable likelihood of prevailing in showing that claim 1, or any of its dependent claims 2, 3, 6, and 7, would have been obvious over Curtis in view of Collins, Doner, and Mays.

Petitioner’s analysis for claim 8 simply refers back to the same arguments it presented against claim 1. Pet. 71–72. Claim 8 recites an end of train unit including, among other things, a processor configured to “generat[e] a first wireless message including a location of the end of train unit” and “transmit[] via the transceiver the first wireless message to an end of train unit monitoring station located off of any train.” Ex. 1001, 10:62–67. Petitioner’s argument as to why an end of train unit having these features is unpersuasive for the same reasons discussed above with respect to claim 1. Accordingly, Petitioner has not shown a reasonable likelihood of prevailing in showing that claim 8, or any of its dependent claims 9–12 and 14, would have been obvious over Curtis in view of Collins, Doner, and Mays.

D. Obviousness Ground Including Bezos

1. Summary of Bezos

Bezos describes a power supply for an end of train unit. Ex. 1009, at (57). Relevant to Petitioner’s challenge, a preferred embodiment of Bezos includes “a battery back-up which is disconnected from the system except in response to certain test conditions, and in the event of failure of the primary power or temporary loss of air during a normal operating mode of the EOT

unit.” *Id.* at 1:61–65. Bezos also describes a fly wheel that can store energy to produce sufficient power for the EOT operating components for “enough time for the EOT to be able to send a message to the HOT advising that it is going off the air due to a power failure.” *Id.* at 4:20–30.

2. Discussion

Petitioner challenges dependent claims 4, 5, and 13 on two grounds: Curtis in view of Collins, Doner, Mays, and Bezos (Pet. 73–78); and Curtis in view of Collins, Doner, and Bezos (*id.* at 78). In each of these grounds, Petitioner relies on Bezos as disclosing the additional limitations of dependent claims 4, 5, and 13. *See id.* at 73–78. For the subject matter of claims 1 and 8, Petitioner relies on the previously discussed combinations of references. *See id.* Petitioner’s use of Bezos does not remedy the deficiencies of Petitioner’s obviousness case against claims 1 and 8 based on the combinations discussed above. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing in its arguments that the subject matter of claims 4, 5, and 13 would have been obvious over either of the asserted grounds.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of the ’850 patent.

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