NOTE: This opinion is nonprecedential.

United States Court of Appeals for the Federal Circuit

HARRIS CORPORATION,
Plaintiff-Appellee,

v.

FEDERAL EXPRESS CORPORATION,
Defendant-Appellant.

2012-1094

Appeal from the United States District Court for the Middle District of Florida in No. 07-CV-1819, Judge John Antoon, II.

Decided: January 17, 2013

BRIAN R. GILCHRIST, Allen Dyer, Doppelt, Milbrath & Gilchrist, P.A., of Orlando, Florida, argued for plaintiff-appellee. With him on the brief was RYAN T. SANTURRI.

KARA F. STOLL, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, of Washington, DC, argued for defendant-appellant. With her on the brief were JASON W. MELVIN; and JEFFREY A. BERKOWITZ, of Reston, Virgin-

ia. Of counsel on the brief was E. CHRIS CHERRY, FedEx Corporation, of Memphis, Tennessee.

Before LOURIE, CLEVENGER, and WALLACH, *Circuit Judges*.

Dissenting opinion filed by *Circuit Judge* WALLACH.

CLEVENGER, *Circuit Judge*.

This is an appeal from a decision by the United States District Court for the Middle District of Florida in a patent infringement suit in which Plaintiff-Appellee Harris Corporation ("Harris") asserted seven patents ("the Asserted Patents") against Defendant-Appellant Federal Express Corporation ("FedEx"). After the court conducted claim construction, a jury found all asserted claims were not invalid and willfully infringed. FedEx then moved for judgment as a matter of law ("JMOL"), arguing that Harris failed to meet its burden of proving infringement and willful infringement, and that FedEx had established by clear and convincing evidence that the patents were obvious and unenforceable due to inequitable conduct. The district court granted the JMOL motion in part, finding that FedEx did not willfully infringe four of the seven Asserted Patents as a matter of law, but denied the motion in all other respects.

FedEx appeals the district court's claim construction ruling as to one term, the district court's denial of JMOL of non-infringement as to certain accused systems, the court's denial of JMOL as to obviousness, and the court's denial of JMOL as to willfulness with respect to the remaining Asserted Patents. For the reasons outlined below, we *reverse* the district court's claim construction, *vacate and remand* the court's denial of JMOL as to non-

infringement and willfulness, and *affirm* its denial of JMOL as to validity.

I

Plaintiff Harris, an international communications and information technology company, is the assignee of a family of patents stemming from a single parent, U.S. Patent No. 6,047,165 (filed Nov. 14, 1995, issued April 4, 2000) ("the '165 patent"), which is entitled "[w]ireless, frequency-agile spread spectrum ground link-based aircraft data communication system." The '165 patent, along with six of its continuations, form the Asserted Patents in this case.[1] All seven of the Asserted Patents are directed to a particular technique for accumulating and storing data reflecting aircraft performance while the plane is airborne, and then upon arrival, transmitting that data via spread spectrum signals to the ground for subsequent analysis.

A brief overview of this field of technology is useful in understanding the Asserted Patents. Since the earliest days of commercial air travel, planes have incorporated a flight data recorder which monitors, collects and stores flight performance data. This device is commonly known as the plane's "black box." These "black boxes" are specially designed to withstand an aircraft mishap so that the data may be recovered and reviewed after the fact. '165 patent, col. 1 ll. 20–34. In 1995, the Federal Aviation

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[1] The other six Asserted Patents are: U.S. Patent Nos. 6,154,637 (issued Nov. 28, 2000) ("the '637 patent"); 6,308,045 (issued Oct. 23, 2001) ("the '045 patent"); 6,990,319 (issued Jan. 24, 2006) ("the '319 patent"); 7,426,387 (issued Sept. 16, 2008) ("the '387 patent"); 7,428,412 (issued Sept. 23, 2008) ("the '412 patent"); and 7,444,146 (issued Oct. 28, 2008) ("the '416 patent").

Administration ("FAA") encouraged all airlines to review the "black box" data on a regular basis, rather than simply after a mishap, to help prevent accidents. In response, artisans developed techniques that allowed airlines to retrieve flight performance data without removing the "black box" from the plane. *Id.* at col. 1 ll. 35–43. One such prior art solution involved equipping each aircraft with a redundant flight-data recorder having a removable storage medium (i.e., a cartridge or floppy disk) that an attendant could physically carry off the plane upon arrival. *Id.* at col. 1 ll. 44–52. This system was nicknamed "sneakernet." Later prior art systems equipped the redundant flight-data recorder with a data output transmitter, so that flight data could be transmitted directly to a ground-based computer system via either a fiber-optic cable or a wireless infrared link. *Id.* at col. 1 l. 60–col. 2 l. 6.

These prior art systems suffered from several drawbacks. For example, "sneakernet" was time and manpower intensive, and subject to error when disks or cartridges were erroneously associated with the wrong planes. *Id.* at col. 1 ll. 53–60. The fiber-optic cable and infrared systems, on the other hand, required the aircraft to be parked at or near the gate because the fiber-optic cable was physically tethered to the ground computer system and infrared transmission required a direct line of sight between the plane and the ground computer. *Id.* at col. 1 l. 61–col. 2 l. 6.

To address these concerns, the inventors of the Asserted Patents proposed a modification to the prior art. Like the prior art, the Asserted Patents employ a device (which the patent calls a "ground data link unit") that stores a redundant copy of the flight data information while the plane is airborne and which is equipped with a

wireless transceiver for transmission upon arrival. In the Asserted Patents, the "ground data link unit" communicates wirelessly with the ground receiver via radio frequency signals—specifically, spread spectrum signals—rather than infrared signals. '165 patent at col. 2 ll. 22–33. Spread spectrum signals have certain benefits over infrared wireless, such as the ability to communicate with the ground receiver without a direct line of sight.

Claim 1 of the '319 patent is representative of the Asserted Patents' invention:

> 1. A method of providing data from an aircraft comprising:
>
> continuously monitoring the flight performance of the aircraft during an entire flight of the aircraft from at least take-off to landing;
>
> generating aircraft data representative of the continuously monitored aircraft flight performance during an entire flight of the aircraft from at least take-off to landing;
>
> accumulating and continuously storing the generated aircraft data within a ground data link unit positioned within the aircraft during the entire flight of the aircraft from at least take-off to landing to create an archival store of such aircraft data;
>
> after the aircraft completes its flight and lands at an airport, transmitting the accumulated, stored generated aircraft data from the ground data link unit over a wideband spread spectrum communications signal to a ground based spread spectrum receiver; and

> demodulating the received spread spectrum communications signal to obtain the accumulated, aircraft data representative of the flight performance of the aircraft during an entire flight of the aircraft from take-off to landing.

See '319 patent at col. 16 l. 52–col. 17 l. 7. Other claims in the Asserted Patents describe slight variations of the type of spread spectrum transmission used to transmit the data or the type of system used for transmission. For instance, certain claims require storing data during two flights rather than one, whereas others claim uploading data to the aircraft via spread spectrum, rather than downloading it to the ground. These are just two of the many variations found among the patents' claims.

II

Defendant FedEx is a global courier service that uses a substantial fleet of aircraft for its deliveries. In 1998, FedEx began equipping its MD-11 aircraft with a system called "TITAN," which was capable of wirelessly transmitting recorded flight data to the ground upon arrival using spread spectrum signals. FedEx later learned that Harris had acquired certain patents related to this technology field, and so it contacted Harris in 2002 to confirm that the TITAN system "is not and never will be in violation of" Harris's patents. Harris responded that certain of its patents were licensed to Spirent, the vendor responsible for FedEx's TITAN system. As such, FedEx had reason to believe that the TITAN systems in its MD-11 aircraft were licensed products, and the TITAN system has not been accused in this case.

In 2003, FedEx decided to incorporate similar functionality into its fleet of older, smaller B727 aircraft. But

instead of purchasing licensed TITAN systems for its B727 fleet, FedEx partnered with a different aircraft parts manufacturer named Avionica to build a brand new system according to FedEx's specifications ("the FedEx/Avionica System"). There is no indication that FedEx made any effort to determine whether this new FedEx/Avionica System infringed Harris's patents, or ever inquired about obtaining a license from Harris before installing FedEx/Avionica Systems on its B727 aircraft. Nevertheless, within a few years every FedEx B727 was equipped with a FedEx/Avionica System.

In 2007, Harris filed suit alleging that the FedEx/Avionica System infringed Harris's ground data link patents. Roughly nine months after the suit was filed, Avionica provided FedEx with a new software "upgrade" for the FedEx/Avionica System. Prior to the installation of this new software option, the FedEx/Avionica System downloaded all of the flight performance data recorded during flight to the ground computer upon arrival. After this new software option was installed, the system's operator could choose to exclude five minutes of the recorded flight data after the plane landed but before the data was transmitted. This new software option apparently served no functional purpose, and was incorporated solely to "design around" Harris's patents. Six months later, FedEx removed the "design-around" systems entirely from the B727 fleet, and today no version of the FedEx/Avionica System is in use.

III

After extensive discovery, claim construction, and summary judgment motions, the case was tried to a jury in July 2010. The jury returned a special verdict finding all of the asserted claims to be not invalid, enforceable

and willfully infringed, and finding that Harris had proven the existence of secondary indicia of nonobviousness.

FedEx moved for JMOL that Harris failed to meet its burden of proving both infringement and willful infringement, and that FedEx had established by clear and convincing evidence that the patents are obvious and unenforceable as a result of inequitable conduct. The court agreed that the jury's finding that FedEx willfully infringed the '319, '387, '412 and '146 patents was not supported by substantial evidence, but denied FedEx's motion in all other respects. Harris was awarded a permanent injunction, compensatory damages, and attorney's fees, but was denied enhanced damages.

FedEx has timely appealed the district court's claim construction ruling, and its denial of FedEx's JMOL motion as to non-infringement, invalidity, and willful infringement of the '165, '637, and '045 patents. We have jurisdiction pursuant to 28 U.S.C. § 1295(a).

IV

Claim construction is reviewed *de novo*. *Cybor Corp. v. FAS Techs.*, Inc., 138 F.3d 1448, 1454–55 (Fed.Cir.1998) (en banc). To ascertain the scope and meaning of the asserted claims, we look to the words of the claims themselves, the specification, the prosecution history, and any relevant extrinsic evidence. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315–17 (Fed.Cir.2005) (en banc).

JMOL is appropriate when "a reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue." Fed.R.Civ.P. 50(a)(1). This court

reviews the denial of a motion for JMOL under the law of the regional circuit. *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 973 (Fed. Cir. 2010). Under the law of the Eleventh Circuit, we must "consider all the evidence, and the inferences drawn therefrom, in the light most favorable to the nonmoving party ... [and] in this light, [determine whether] there was any legally sufficient basis for a reasonable jury to find in favor of the nonmoving party." *Advanced Bodycare Solutions, LLC v. Thione Int'l, Inc.*, 615 F.3d 1352, 1360 (11th Cir. 2010) (internal citations and quotations marks omitted)

We review the jury's conclusions on obviousness, a question of law, without deference, and the underlying findings of fact, whether explicit or implicit within the verdict, for substantial evidence. *Johns Hopkins Univ. v. Datascope Corp.*, 543 F.3d 1342, 1345 (Fed. Cir. 2008) (quotations omitted).

V

We turn first to the issue of claim construction,[2] and the single limitation at issue on appeal: "transmitting the accumulated, stored generated aircraft data."[3] Before the

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[2] We reject Harris's theory that, because FedEx no longer uses the infringing system and the parties have settled for a compensatory-damages sum that will not be impacted by this appeal, claim construction is a moot issue. FedEx is presently enjoined from further use of its "design-around," and reversing the district court's claim construction might provide FedEx with relief from this injunction. Accordingly, this issue is not moot.

[3] Each of the asserted claims includes (or depends from a claim that includes) some variation of this limitation, although the limitation is phrased slightly differently across the seven Asserted Patents. For the purposes of claim construction on appeal, the parties treat the phras-

district court, Harris argued that this term needed no construction and submitted a proposed plain meaning of: "transmitting aircraft data that has been accumulated, stored, and generated." FedEx argued that a construction was necessary and proposed the following: "transmitting *all* the aircraft data that has been accumulated or stored or generated." Notably, the FedEx/Avionica "design-around" system transmits less than "all" of its accumulated data—five minutes less, to be exact—and so this system arguably would not literally infringe under FedEx's construction. The district court disregarded the parties' proposed constructions and construed the term *sua sponte* to require "only the transmission of data sufficient to provide a comprehensive, long-term picture of the flight performance" to the ground upon arrival. *Harris Co. v. Fed. Exp. Co.*, 698 F. Supp. 2d 1345, 1358 (M.D. Fla. 2010) (claim construction opinion).

On appeal, FedEx again urges the construction it proposed below, whereas Harris defends the district court's *sua sponte* construction. The dispute boils down to how much of the data accumulated while the plane is in the air must be transmitted to the ground once the plane reaches its destination. FedEx concedes that while the plane is airborne, the ground data link unit may collect and store something less than "all" available data. But FedEx insists that once the plane has landed, any and all data accumulated and stored in the ground data link unit must be transmitted to the ground. Harris, on the other hand, urges a more flexible interpretation that would permit transmission of a subset of all data stored in the

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ing found in claim 1 of the '319 patent as representative of this limitation across all asserted claims, and we follow suit.

ground data link unit, provided that data is representative of the plane's performance over the entire flight.

Of the two constructions, FedEx's interpretation remains truest to the claim language. The claim introduces the relevant data set by describing how it is first "generated" during an entire flight and then "accumulated" and "stored" in the ground data link unit between take-off and landing:

> *generating aircraft data* representative of the continuously monitored aircraft flight performance during an entire flight of the aircraft from at least take-off to landing;
>
> *accumulating and continuously storing the generated aircraft data* within a ground data link unit positioned within the aircraft during the entire flight of the aircraft from at least take-off to landing to create an archival store of such aircraft data;

'319 patent at col. 16 ll. 57–64 (emphasis added). The claim's next step, where we encounter the disputed limitation, describes transmitting "the" data using identical language as the previous claim steps:

> after the aircraft completes its flight and lands at an airport, *transmitting the accumulated, stored generated aircraft data from the ground data link unit* over a wideband spread spectrum communications signal to a ground based spread spectrum receiver;

'319 patent at col. 16 l. 65–col. 17 l. 2 (emphasis added). When identical language is found in multiple steps within

the same claim, it is reasonable to assume that all references relate to the same subject matter. *See Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1356 (Fed. Cir. 1999) (holding that "a discharge rate" in an earlier limitation refers to the same discharge rate as "the discharge rate" in a later limitation); *Microprocessor Enhancement Corp. v. Texas Instruments, Inc.*, 520 F.2d 1367, 1375 (Fed. Cir. 2008) (acknowledging that it is a reasonable "initial assumption" to construe a single claim term "consistently with its appearance in other places in the same claim") (quotations omitted). Given this claim's prior description of generating, accumulating and storing a particular set of data in the ground data link unit, it is entirely reasonable to interpret "transmitting the accumulated, stored generated aircraft data from the ground data link unit" as referring to that same data set. This is especially true where, as here, the later instance refers to "the" data and therefore begs for some antecedent basis.

Harris nonetheless argues that nothing in this language requires that "all" of the data in the ground data link unit must be transmitted once the plane lands, and accuses FedEx of importing the word "all" into the claim in the absence of support for such an inclusion. We reject this argument for two reasons. First, although the claim does not expressly require that "all" of the accumulated data must be transmitted, it similarly lacks any indication that some subset of the accumulated data should be transmitted, and if so what that subset should be. In the absence of such guidance, FedEx's interpretation seems entirely reasonable. Second, Harris's construction would require us to interpret "the . . . data" to mean "a subset of the data sufficient to provide a comprehensive, long-term picture of the flight performance." So we have been presented with competing constructions that each import additional language into the claim. For the reasons

outlined above, we believe FedEx's most naturally aligns with the claim language.

Harris argues that the subsequent and final element of Claim 1 contradicts FedEx's construction because the data set is described at this "demodulation" step as "representative of the flight performance:"

> demodulating the received spread spectrum communications signal to obtain the accumulated, aircraft data *representative of the flight performance* during the entire flight from take-off to landing.

'319 patent at col. 17 ll. 3–7 (emphasis added). However, the phrase "representative of the flight performance" as used in this clause modifies the "accumulated, [*sic*] aircraft data," not the transmitted data. This supports FedEx's position that the data's scope becomes fixed upon termination of the in-flight accumulation phase, and may not be further summarized after the plane lands but prior to transmission.

The specification is unhelpful in evaluating this issue. While it is true that nothing in the specification indicates that "all" data accumulated during the flight must be transmitted to the ground once the plane lands, it is also true that the term "comprehensive, long-term picture of the flight performance" is found nowhere in the specification. The written description is therefore at best a neutral factor in this analysis.

We last turn to the prosecution history, from which the district court apparently derived the language used in its *sua sponte* construction. In particular, the district court adopted statements Harris made during reexamina-

tion of the '045 patent when distinguishing its invention from U.S. Patent No. 5,445,347 (issued Aug. 29, 1995) ("Ng"). Ng (discussed *infra* in further detail) teaches a system for monitoring vehicle operating conditions whereby signals are transmitted from the vehicle to the ground via spread spectrum signals at intermittent times during a voyage as the vehicle passes certain ground receivers. Harris argued that its invention did not transmit Ng's "snapshots" of data but rather "a comprehensive long-term picture" of the flight performance, stating:

> [In Ng,] [t]he only data available for transmission is a momentary snap-shot of the continuously monitored operating conditions.
>
> Performing inspections in near real time in an automated wireless preventive maintenance monitoring system has nothing in common with acquiring a comprehensive long-term picture derived from the totality of the flight performance data in order to identify and remedy adverse trends.

J.A. 3424. But these statements address only the data "available for transmission," comparing Ng's "momentary snapshot" to Harris's "comprehensive long-term picture derived from the totality of the flight performance data." It is entirely ambiguous whether the data "available for transmission" refers to the extent and type of data that is "accumulated" during the voyage, or to the amount of data that is "transmitted' upon arrival. Even the district court noted that this language was "amendable to multiple reasonable interpretations." *Harris*, 698 F. Supp. 2d at 1356. As a general rule, prosecution history cannot overcome the natural reading of the claim when the

alleged disavowal is ambiguous. *See Elbex Video, Ltd. v. Sensormatic Electronics Corp.*, 508 F.3d 1366, 1371 (Fed. Cir. 2007). Given the ambiguity of the prosecution history, there is no basis for incorporating this language into this term's construction.

Thus, all intrinsic evidence either supports FedEx's construction or is neutral, and because the parties have not provided any extrinsic evidence that sheds light on this limitation, we must return to the most reasonable interpretation of this limitation as it appears in the claim. *Phillips*, 415 F.3d at 1316 ("The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be [] the correct construction."). As such, we reverse the court's construction of the claim term "transmitting the accumulated, stored generated aircraft data" in favor of FedEx's proposed construction: "transmitting *all* the aircraft data that has been accumulated or stored or generated."

VI

Next, we turn to the district court's denial of FedEx's JMOL motion on the issue of non-infringement. When a patent infringement verdict is based on an incorrect claim construction, we reverse the trial court's denial of a motion for judgment as a matter of law if no reasonable jury could have found infringement under the proper claim construction. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1333 (Fed. Cir. 2008).

The jury found that both the FedEx/Avionica System and the "design around" infringed the Asserted Patents. FedEx only appeals the judgment with respect the "design-around" system, arguing that "[i]t is undisputed that FedEx's design-around does not transmit a five-minute

segment of the data that was accumulated and stored and, accordingly, it does not transmit the same data set that was accumulated and stored." FedEx thus contends that a reversal of the district court's claim construction leaves this court with no option but to also reverse the district court's denial of FedEx's JMOL motion for non-infringement.

But the record reflects that FedEx's "design-around" simply provided its users with the *option* to delete five minutes' worth of accumulated data prior to transmission. Trial Tr. 116:2–20, July 21, 2010, ECF No. 272. So although it might have been possible to use the "design-around" system in a non-infringing manner, it was also apparently possible to use the system exactly like the original FedEx/Avionica System, i.e., in an infringing manner. As such, use of FedEx's "design-around" system might nevertheless infringe an asserted method claim, such as claim 1 of the '319 patent, if used with the "five minute" option turned off. Similarly, the "design around" might also infringe certain asserted system claims due to its capability to behave like the original FedEx/Avionica System.

We therefore vacate the district court's denial of JMOL on the issue of non-infringement as to the FedEx/Avionica "design-around" system, and remand for further consideration consistent with our claim construction ruling.

VII

Before addressing FedEx's validity challenges, we pause to reject FedEx's contention that a new trial on validity is necessary as a result of our reversal of the district court's claim construction. A claim construction

reversal does not, in and of itself, justify a new validity trial; rather, there must be some showing that the erroneous construction somehow prejudiced the validity case below. *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1344 (Fed. Cir. 2003). Harris's briefing challenged FedEx to explain how its invalidity case was prejudiced by the district court's claim construction, and FedEx failed to do so. Indeed, the district court's construction was broader than the proper construction, insofar as it encompassed systems that transmitted "all" accumulated data to the ground (i.e., the FedEx/Avionica System) as well as systems that transmitted less than "all" such data (i.e., the FedEx/Avionica "design-around"). So if anything, the correct claim construction would only make proving invalidity more difficult for FedEx in a new trial.

We therefore turn to the merits of FedEx's validity appeal.

A

FedEx presented a number of prior art obviousness contentions at trial, but only two are before us on appeal. The first involves the Ng reference. As discussed above, Ng teaches a system for monitoring vehicle operating conditions whereby signals are transmitted from the vehicle to the ground via spread spectrum signals at intermittent times during the voyage as the vehicle passes certain ground receivers. While primarily targeted at trains, Ng acknowledges the invention could be used in airplanes. Ng at col. 3 ll. 22–28. In Ng's preferred embodiment, a diagnostic unit monitors the train's operating conditions, stores a signal representing the train's current status, and then periodically transmits a spread-spectrum signal conveying the train's status to ground-based receivers located at fixed stations as the train passes them

along its route. *See id.* at col. 3 ll. 17–31; col. 4 ll. 53–57; col. 4 l. 62–col. 5 l. 5. As noted above, Ng was before the PTO at one point during either prosecution or re-examination of all seven of the Asserted Patents, and was specifically addressed and overcome during re-examination of the '045 patent.

FedEx's second obviousness contention involves a 1978 publication describing the data recording systems on an L-1011 aircraft ("L-1011") combined with a September, 1994, presentation given by Douglas Aircraft engineer Pete Hibson ("FCM-69"). The L-1011 reference essentially teaches the "sneakernet" system, i.e., a system for collecting data during aircraft flights that samples and records data onto a "Quick Access Recorder" ("QAR") which utilized removable cassettes. QAR cassettes could be removed from an aircraft and processed to detect any potential issues on a ground-based "playback station." There is no dispute that L-1011 is prior art to the Asserted Patents, and it was considered during prosecution or reexamination of five of the seven Asserted Patents.

The FCM-69 reference is a slideshow from a public presentation given by Douglas Aircraft engineer Pete Hibson three months before the Asserted Patents' earliest priority date. Mr. Hibson, working with spread-spectrum expert Dr. Darius Modarress, recognized that many of the problems caused by infrared or fiber optic cables could be resolved by replacing these with spread-spectrum transmissions. The first page of the FCM-69 reference describes the purpose of the presentation: to set forth a "novel concept of using Spread Spectrum technology to interface a PMAT system to an airplane in place of a direct connection to the aircraft." The document begins with an overview of the downsides of presently available fiber-optic and infrared systems. The document then

describes how these problems could be largely solved by implementing spread spectrum. For instance, it describes how spread spectrum offered "lower cost and increased functionality" and eliminated the need to tether the plane using the fiber-optic cable. Spread spectrum, the presentation continued, required no license from the FCC, the signals were largely immune to interference and had high transmission rates, and spread spectrum could be implemented using commercially-available products rather than costly specialized devices. But FCM-69 also notes that data rates for spread spectrum were, on average, 100 times slower than infrared.

B

FedEx contends that both of its contentions present a clear and convincing case for obviousness. As for Ng, FedEx contends that the this system could be easily adapted to behave like the Harris invention by merely adding extra memory to Ng's data recorder, thus providing the system with sufficient capacity to store an entire trip's worth of data. As for the second contention, FedEx argues that L-1011 generally teaches transferring data collected during a flight to the ground for analysis, whereas FCM-69 teaches the purportedly novel aspect of Harris's invention, which is transmitting the accumulated flight data using spread spectrum signals.

Harris argues, in response, that FedEx provided the jury with insufficient evidence to support its obviousness contentions, and that the jury heard convincing evidence that undermines FedEx's contentions. We agree with Harris. FedEx's expert opined on the Ng reference only in the context of three claims (dependent claims 5, 15, and 25 of the '319 patent). And although witnesses testified regarding the L-1011 and FCM-69 references separately,

FedEx apparently only proposed this combination to the jury during its closing argument when the two references were recited among a laundry list of prior art.

The weakness of FedEx's trial evidence troubles FedEx's appellate reliance upon these combinations to invalidate all sixty-two claims of the Asserted Patents. FedEx did not at trial, and does not on appeal, set forth a claim-by-claim analysis of all the asserted claims describing which elements can be found in which reference. The asserted claims include many variations on claim 1 of the '319 patent, such as requiring that the spread spectrum signal use the "S band" (which is required by claims 3 and 9 of the '165 patent, and claim 39 of the '637 patent), or that the system use a spread spectrum signal transmitting a "probe beacon" to select a sub-band frequency channel (which is required by all asserted claims in the '637 patent) or that the system automatically download the data from the aircraft to the ground upon landing (required by, *inter alia*, all asserted claims from the '387 patent). FedEx argues that these are "subtle variations" that "do not affect patentability in view of the prior art." But this does not relieve FedEx of its burden to prove by clear and convincing evidence that these additional limitations actually were known in the prior art, which it has failed to do.

FedEx also failed to explain why an artisan would be motivated to make its suggested prior art modifications. Although evidence of motivation to combine is not required to prove invalidity, it may nevertheless be "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418-22 (2007). This is particularly true in the case of Ng, where FedEx

suggests without further explanation that it would have been obvious to re-engineer a system that periodically transmits mid-voyage status updates so that it instead accumulates an entire trip's worth of data and transmits all of the accumulated data at once upon arrival. Absent any explanation to the contrary, one suspects FedEx reached this conclusion using impermissible hindsight.

The limited testimony FedEx offered at trial concerning its obviousness contentions suffered from other deficiencies. During cross-examination, Dr. Helfrick was unable to speak to certain aspects of the Ng reference such as whether the Ng system recorded data over the entire life of the train's voyage or how much information the Ng system transmitted to a station when the train passed by. Meanwhile, Mr. Hibson—FedEx's primary witness concerning the FCM-69 reference—was discredited during cross-examination. For instance, the jury learned about an e-mail Mr. Hibson sent when volunteering to assist in FedEx's defense which expressed anger at Harris's licensing success because Hibson had "taught [Harris] everything, including wireless." J.A. 2704–05; Trial Tr. 136:21–142:13, July 26, 2010, ECF No. 275. Moreover, when asked during cross-examination why he agreed to testify on FedEx's behalf, Mr. Hibson responded that he was a Boeing employee and FedEx was "one of [Boeing's] best customers, [so] we want to keep them happy." Trial Tr. 141:6–17, July 26, 2010, ECF No. 275.

The jury also heard testimony that the FCM-69 proposal actually taught away from spread spectrum. We have held that "[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In*

re Gurley, 27 F.3d 551, 553 (Fed. Cir. 1994). Although FCM-69 largely encourages the use of spread spectrum, the presentation also included certain facts that might have discouraged an artisan from using spread spectrum. For instance, the presentation acknowledged that spread spectrum had slower data transfer rate than infrared, and too many planes using spread spectrum at once could result in higher error rates or dropped connections.

On top of all this, the jury learned that all three references were before the PTO and considered during prosecution of the '387 patent, the '412 patent, and the '146 patent, and Ng was also considered during prosecution of the '165 patent, the '319 patent. All three references were also before the PTO during the reexamination of the '165 and '045 patents, and as noted above, Harris directly addressed and overcame a challenge based upon Ng during the latter patent's reexamination. Although none of these facts impact FedEx's burden of proof, they are reasonable considerations when determining whether an invalidity defense has been proven by clear and convincing evidence. *Microsoft Corp. v. i4i Ltd. P'ship*, 131 S. Ct. 2238, 2251, 180 L. Ed. 2d 131 (2011).

Finally, the jury found that Harris had proven the existence of a number of secondary considerations of nonobviousness, which can buttress a court's finding of nonobviousness. *See Eli Lilly & Co. v. Zenith Goldline Pharmaceuticals, Inc.*, 471 F.3d 1369, 1380 (Fed. Cir. 2006) ("Lilly proved extensive secondary considerations to rebut obviousness . . . these objective criteria buttressed the trial court's conclusion of nonobviousness."). Harris's successful licensing program is evidence of commercial success and acceptance by others, and the FedEx/Avionica System is evidence that others copied its invention. Moreover, Mr. Hibson testified that his 1994 presentation

was rejected because his colleagues at the time were focused upon using fiber-optic and infrared transmissions. Harris submitted this as evidence of skepticism by other experts, and also that others had tried unsuccessfully to solve the problem. FedEx has not appealed any of these findings.

FedEx bears the burden to demonstrate invalidity by clear and convincing evidence. Yet the evidence regarding the scope and content of these references and the differences between the references and the asserted claims fail to satisfy this standard of proof, and FedEx does not contest the existence of Harris's secondary considerations of nonobviousness. Accordingly, we affirm the district court's denial of JMOL as to invalidity.

VIII

Finally, we address FedEx's appeal of the district court's denial of JMOL on the issue of willfulness as to certain of the Asserted Patents. In its JMOL motion, FedEx argued that it had raised substantial questions regarding infringement and validity throughout the litigation, and that this precluded a finding that it met the first prong of the analysis set forth in *In re Seagate Tech., LLC*, 497 F.3d 1360, 1366 (Fed. Cir. 2007), which requires that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent. FedEx also argued that Harris failed to introduce clear and convincing evidence regarding whether FedEx knew or should have known about the objectively high risk, which is the second *Seagate* prong. The district court granted FedEx's motion as to four of the Asserted Patents, but denied the motion as to the other three.

Citing *Metabolite Labs., Inc., v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1359 (Fed. Cir. 2004), the district court applied a deferential standard of review to the jury's willfulness findings, stating that "[w]hether infringement was willful is a question of fact reviewed for substantial evidence." But this court has since held in *Bard Peripheral Vascular, inc. v. W.L. Gore & Associates, Inc.*, that "simply stating that willfulness is a question of fact oversimplifies this issue." 682 F.3d 1003, 1006 (Fed. Cir. 2012). As such, the district court should have reviewed the *Seagate* "objective prong" evidence *de novo* because "[t]he ultimate legal question of whether a reasonable person would have considered there to be a high likelihood of infringement of a valid patent should always be decided as a matter of law by the judge." *Id.* at 1008.

In view of this, and also in light of our above claim construction and noninfrignement rulings, we vacate the JMOL order as to the willfulness issue and remand for further consideration in accordance with this opinion.

CONCLUSION

For the foregoing reasons, we reverse the district court's order on claim construction, we vacate and remand the district's court's denial of JMOL as to non-infringement and willfulness, and we affirm on all other counts.

AFFIRMED IN PART, REVERSED IN PART, AND VACATED AND REMANDED IN PART

COSTS

No costs.

NOTE: This opinion is nonprecedential.

United States Court of Appeals for the Federal Circuit

HARRIS CORPORATION,
Plaintiff-Appellee,

v.

FEDERAL EXPRESS CORPORATION ,
Defendant-Appellant.

2012-1094

Appeal from the United States District Court for the Middle District of Florida in No. 07-CV-1819, Judge John Antoon, II.

WALLACH, *Circuit Judge*, dissenting in part.

I do not agree that the "transmitting data" terms require transmission of all of the accumulated data. Rather, because I conclude that the terms require transmission of only such data sufficient to provide a representative picture of the aircraft flight performance, I dissent in part.

The majority relies upon the rule: "The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be . . . the correct construction." *Phillips v. AWH Corp.*,

415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc) (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). However, the new construction the majority adopts, requiring "transmitting *all* of the aircraft data that has been accumulated or stored or generated," Maj. Op. at 15 (emphasis in original), is not supported by the claim language, specification, or prosecution history. Moreover, it improperly narrows the claim language, limiting an otherwise broadly drafted claim. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (quoting *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1327 (Fed. Cir. 2002)) ("[T]he claims of a patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'").

The majority determines that it is reasonable that "the" data set transmitted must be "all" the data that was accumulated and stored on the basis that "identical language is found in multiple steps within the same claim" which "begs for some antecedent basis." Maj. Op. at 12. Claim 1 of the '319 patent states, in part:

> A method of providing data from an aircraft comprising:
>
> . . .
>
> [a] *generating aircraft data representative of the continuously monitored aircraft flight performance* during an entire flight of the aircraft from at least take-off to landing;
>
> [b] *accumulating and continuously storing the generated aircraft data* . . . to create an archival store of such aircraft data;

> [c] after the aircraft completes its flight and lands at an airport, *transmitting the accumulated, stored generated aircraft data* . . . ; and
> [d] demodulating the received spread spectrum communications signal to obtain the *accumulated, aircraft data representative of the flight performance* of the aircraft during an entire flight of the aircraft from take-off to landing.

'319 patent col. 16 l. 52–col. 17 l. 7 (emphases and paragraphing added). The majority refers to "the" data set, but "the" data set is not consistently defined throughout. Instead, "data" is modified as "generated aircraft data" in limitation [b]; as "accumulated, stored generated aircraft data" in limitation [c]; and finally, as "accumulated, aircraft data representative of the flight performance" in limitation [d].[1]

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[1] The majority opinion cites to *Process Control* to support its reasoning. Maj. Op. at 12 (*Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350 (Fed. Cir. 1999). However, in that case the language provided meaning to an otherwise indefinite term, whereas here FedEx did not challenge Harris's expert opinion that one skilled in the art would understand how much data would be required to provide a comprehensive long-term picture of flight performance. *See* J.A.1599-1602. Here the only identical language used throughout the claim is "aircraft data," thus the antecedent basis the majority references should be to limitation [a] where "aircraft data" is first modified. Accordingly, the antecedent basis for each of the remaining limitations is to "aircraft data" which would provide "aircraft data representative of . . . flight performance." Furthermore, this court has since provided additional guidance on *Process Control*, explaining that the construction of "discharge rate" was supported by, not reliant upon, the antecedent basis; a "patentee's mere use of a term with an antecedent does not require that both terms have the same meaning." *Microprocessor Enhance-*

The only consistent term in each limitation is "aircraft data" which is defined in limitation [a] to mean "data representative of . . . aircraft flight performance." The way "aircraft data" is described in the various limitations of the claims implies discretion to generate, store, transmit, and demodulate only such data necessary to be "representative" of flight performance. Thus, the claim does not require that "all" of the accumulated, stored data be transmitted, as long as the transmitted data is representative of the aircraft flight performance. In fact, the term "all" is nowhere to be found in the claim language. *See* Maj. Op. at 12–13. Accordingly, defining limitation [c] to require transmitting "all" of the flight performance data accumulated is counterintuitive within the context of the claims. *See Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) ("Proper claim construction . . . demands interpretation of the entire claim in context, not a single element in isolation.").

Additionally, the majority concedes that nothing in the specification indicates how much data should be accumulated, stored, or transmitted. The prosecution history—which suggests that Harris intended his invention to create a comprehensive picture representative of an entire flight—likewise does not require a more restrictive reading.[2] *See* Maj. Op. at 14–15. Thus, there is no

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ment Corp. v. Texas Instruments Inc., 520 F.3d 1367, 1375 (Fed. Cir. 2008).

[2] Before the PTO, Harris distinguished its invention from prior art by addressing the difference between sending real-time data at various intervals (as was done in Ng by a train transmitting data as it traveled past fixed locations), J.A.3272-74, as opposed to accumulating data to gain a comprehensive picture representative of an entire flight. Harris's representations during reexamination reveal nothing that limits the scope of transmitting data to *all* of the accumulated and stored data. The

reason to limit the data accumulated, stored, or transmitted to anything but that which would be representative of flight performance. *See Liebel-Flarsheim*, 358 F.3d at 906. Because the majority's construction unnecessarily restricts the claim terms without support from the claim language, specification, or prosecution history, I respectfully dissent.

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majority holds that the prosecution history cannot overcome the natural reading of the claim, but because its reading of the claim unnecessarily adopts a limitation, it cannot be the most reasonable interpretation.