

United States Court of Appeals for the Federal Circuit

2007-1449

COMMONWEALTH SCIENTIFIC AND
INDUSTRIAL RESEARCH ORGANISATION,

Plaintiff-Appellee,

v.

BUFFALO TECHNOLOGY (USA), INC.
and BUFFALO, INC.,

Defendants-Appellants.

Daniel J. Furniss, Townsend and Townsend and Crew LLP, of Palo Alto, California, argued for plaintiff-appellee. With him on the brief were Gary H. Ritchey and Nancy L. Tompkins.

Richard D. Kelly, Oblon, Spivak, McClelland, Maier & Neustadt, P.C., of Alexandria, Virginia, argued for defendants-appellants. With him on the brief were Robert C. Mattson, Frank J. West, Takahiro Miura, and Robert C. Nissen. Of counsel were Joanna H. Kim and Richard J. Coddington, Akin, Gump, Strauss, Hauer & Feld, LLP, of Los Angeles, California.

Richard C. Vasquez, Morgan Miller Blair, a Law Corporation, of Walnut Creek, California, for amici curiae Accton Technology Corporation (Taiwan). With him on the brief were Jeffrey T. Lindgren, Kevin R. Brodehl, and Eric W. Benisek.

Ruffin B. Cordell, Fish & Richardson P.C., of Washington, DC, for amicus curiae Microsoft Corporation. With him on the brief was Barry K. Shelton, of Austin, Texas.

Theodore B. Olson, Gibson, Dunn & Crutcher LLP, of Washington, DC, for amici curiae Atheros Communications, Inc., et al. With him on the brief were Matthew D. McGill, Amir C. Tayrani, and Thomas A. Burns.

Roy T. Englert, Jr., Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP, of Washington, DC, for amici curiae Battelle Memorial Institute, et al. With him on the brief was Mark T. Stancil.

Kathleen M. Sullivan, Quinn Emanuel Urquhart Oliver & Hedges, LLP, of Redwood Shores, California, for amici curiae Nokia Corporation, et al. With her on the brief were Brian C. Cannon and Tun-Jen Chiang. Of counsel on the brief were Ronald A. Antush and David L. Cohen, Nokia Corporation and Nokia Inc., of Irving, Texas.

Richard W. Clary, Cravath, Swaine & Moore LLP, of New York, New York, for amicus curiae Qualcomm Incorporated.

Steffen N. Johnson, Winston & Strawn LLP, of Washington, DC, for amicus curiae Technology Properties Limited. With him on the brief were Gene C. Schaerr, Andrew C. Nichols, and James F. Hurst, of Chicago, Illinois.

Robert A. Cote, McKool Smith, P.C., of New York, New York, for amicus curiae Wi-LAN, Inc. With him on the brief were Robert E. Goodfriend and Jason Blackstone, of Dallas, Texas, Rodney R. Sweetland, III, of Washington, DC, and Gretchen K. Harting and Seth R. Hasenour, of Austin, Texas.

Appealed from: United States District Court for the Eastern District of Texas

Judge Leonard Davis

United States Court of Appeals for the Federal Circuit

2007-1449

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION,

Plaintiff-Appellee,

v.

BUFFALO TECHNOLOGY (USA), INC.
and BUFFALO, INC.,

Defendants-Appellants.

Appeal from the United States District Court for the Eastern District of Texas
in case no. 2:05-CV-53, Judge Leonard Davis.

DECIDED: September 19, 2008

Before LOURIE, RADER, and BRYSON, Circuit Judges.

Opinion for the court filed by Circuit Judge BRYSON. Opinion concurring in the result filed by Circuit Judge LOURIE.

BRYSON, Circuit Judge.

Commonwealth Scientific and Industrial Research Organisation (“CSIRO”) is Australia’s national science agency. It engages in a range of basic and applied scientific research in diverse fields. One of its research projects has been directed to solving problems presented by indoor wireless local area networks (“WLANs”). WLANs usually have a network topology consisting of one or more access points with a wired connection to a local area network. They feature wireless connections to one or more transceivers that reside on remote devices such as laptop computers. The remote

devices communicate with the network access points by way of radio wave transmissions.

One of the difficulties encountered by those who sought to develop WLAN systems was the problem of multiple, echoed signals traveling from transmitters to receivers. The multiple, echoed signals are caused by the “bouncing” of transmitted radio waves off objects within a room or building, causing the echoed signals to reach the receiver at different times subsequent to the receipt of the main signal. The “echo effect” caused by the bouncing signals creates what is known as the “multiple path propagation” or “multipath” problem. When the multipath problem is present, a single signal sent from a transmitter will be received multiple times by the receiver over a short period of time. When that happens, the echoes from a first transmission may mask subsequent transmissions.

One means of dealing with the multipath problem is to delay the transmission of subsequent signals sufficiently to avoid the masking effect. Delaying the transmission of subsequent signals, however, reduces the maximum data rate the network can achieve and thereby renders the wireless transmission system less useful for many applications.

In order to combat the multipath problem without reducing the data transmission rate of the system, CSIRO invented a solution that was ultimately described and claimed in U.S. Patent No. 5,487,069 (“the ’069 patent”). The proposed solution was to transmit different portions of a series of signals containing the data to be transmitted over a number of different frequency channels. By transmitting data on many different frequencies, the system would ensure that none of the signals in the series (or their

echoes) would interfere with other signals transmitted on different channels. And by transmitting a number of signals on different frequencies simultaneously, the WLAN system could achieve a high overall transmission rate while still allowing sufficient temporal separation between each signal transmitted on each frequency to avoid intersymbol interference.

In a patent infringement action filed in the United States District Court for the Eastern District of Texas, CSIRO accused Buffalo Technology (USA), Inc., and Buffalo, Inc., (collectively, "Buffalo") of infringing various claims of the '069 patent. After construing the disputed claim terms of the '069 patent, the district court addressed the parties' cross-motions for summary judgment. In its order on those motions, the court granted summary judgment in favor of CSIRO on the contested issues of patent validity and infringement.

Independent claim 42 is one of the claims that the district court found to be infringed. That claim provides as follows:

A transceiver for operation in a confined multipath transmission environment, said transceiver comprising antenna means coupled to transmission signal processing means and to reception signal processing means, said transmission signal processing means in turn coupled to an input data channel, said transceiver being operable to transmit and receive data at radio frequencies, said transmission signal processing means comprising modulation means for modulating input data of said input data channel into a plurality of sub-channels comprised of a sequence of data symbols such that the period of a subchannel symbol is longer than a predetermined period representative of the time delay of significant ones of non-direct transmission paths, means to apply data reliability enhancement to said data passed to said modulation means and means, interposed between said data reliability enhancement means and said modulation means, for interleaving blocks of said data.

Independent claim 56, which the court also found to be infringed, is similar to claim 42, but it claims a transmitter instead of a transceiver. Independent claim 68, also found to

be infringed, contains many of the elements of claim 42, but instead of claiming an apparatus, it claims a method of transmitting data in a confined multipath environment of radio frequencies.

Following the district court's entry of summary judgment of infringement, CSIRO moved for the entry of a permanent injunction. After a hearing, the court entered an injunction against Buffalo, as requested.

On appeal, we affirm the district court's summary judgment rulings in all but one respect. With respect to the issue of validity, we uphold the court's entry of summary judgment that the '069 patent was not anticipated. We also uphold the district court's entry of summary judgment that the '069 patent was not invalid because of the addition of new matter to the application or because the asserted claims lacked a sufficient written description in the original specification. With respect to the issue of obviousness, however, we conclude that the district court erred by entering summary judgment against Buffalo because we hold that there was a disputed issue of material fact as to whether the prior art references that were before the district court were combinable in a manner that would have rendered the asserted claims of the '069 patent obvious. Although we vacate the summary judgment of obviousness, we have nonetheless addressed the issue of infringement, on which the district court entered summary judgment against Buffalo, because that issue will continue to be important to the ultimate disposition of the case unless the claims are held to be invalid for obviousness. As to that issue, we uphold the district court's summary judgment of infringement.

The summary judgment proceedings in this case were unusual in that the parties stipulated that the district court could make findings of fact with respect to disputed factual issues in the course of deciding the cross-motions for summary judgment. At the summary judgment hearing on August 15, 2006, the trial judge asked the parties to confirm “with respect to the issue of infringement and with respect to the issue of validity that both sides agree that the Court has before it all of the record that it needs to determine both of these issues, whichever way it might ultimately determine to go.” Both parties agreed. For further clarification, the court then asked the parties, “[I]f the Court gets into anything where there is a factual issue that needs to be determined, are you both stipulating that you have before the Court the record and are agreeing that the Court can make that factual determination?” Again, both parties agreed. Buffalo’s counsel later stated that the stipulation permitting the court to decide any fact issues that might arise applied only to those issues on which Buffalo had moved for summary judgment. Those issues included infringement, anticipation, and invalidity because of a written description violation based on the alleged introduction of new matter. But with respect to obviousness, as to which Buffalo did not file a cross-motion for summary judgment, Buffalo’s counsel stated that “any factual issues that came up in the context of obviousness would be reserved for later adjudication.” After a brief colloquy between the court and counsel, it was agreed that the court would not make findings of fact on obviousness, but instead would decide on summary judgment whether Buffalo had met its burden of “presenting enough evidence to raise a fact issue sufficient to get to a jury on the question of obviousness.”

On appeal, Buffalo acknowledges that the parties agreed to allow the court to decide factual issues at the summary judgment stage, but it argues that with respect to anticipation the stipulation was limited to claims 68-72. The record on that point is somewhat unclear. Buffalo's counsel stated at one point that the stipulation was intended to permit the court to decide any factual issues that arose in connection with any matters as to which the parties had filed cross-motions for summary judgment, "to the extent that those cross-motions really overlap." Buffalo now contends that with respect to anticipation the stipulation was limited to claims 68-72 because even though CSIRO moved for summary judgment of no anticipation as to all the asserted claims, Buffalo moved for summary judgment of anticipation only as to claims 68-72.

While the record is not as clear as it could be on this point, the district court interpreted the stipulation to grant it the authority to decide any factual issues relating to anticipation. Given that the district court is in the best position to understand the position of the parties as expressed through their series of exchanges with the court at the summary judgment hearing, we sustain the court's interpretation of the stipulation. Accordingly, we will apply the same standard on appeal that applies to the decisions of a district court after a bench trial with respect to the court's rulings on (1) anticipation, (2) invalidity because of new matter and written description violations, and (3) infringement of the asserted claims. With respect to the issue of obviousness, we will review the trial court's rulings under the conventional summary judgment standard.

II

Buffalo's principal argument on anticipation is based on an article by J.C. Rault and others entitled "The Coded Orthogonal Frequency Division Multiplexing (COFDM)

Technique, and its Application to Digital Radio Broadcasting Towards Mobile Receivers.” That article, which was published by the Institute of Electrical and Electronics Engineers (“IEEE”) in 1989, describes the problems presented by transmitting signals to mobile receiving stations (such as moving vehicles) in a dense urban area. In particular, the article addresses the dual problems of (1) frequency variation in signals received by moving vehicles due to the Doppler effect and (2) multipath propagation of signals “due to multiple reflections by buildings and other scattering structures around the vehicle.” According to the Rault article, those problems could both be addressed by the use of coded orthogonal frequency division multiplexing (“COFDM”). That is, the data could be transmitted by interleaving a sequence of short symbol transmissions over multiple channels of different frequencies so that the transmission rate for each symbol could be slow enough to avoid interference from signal reflections, while the transmission rate for the entire multiplexed transmission would still be high enough to be useful for high-speed applications. At the same time, the spacing of the multiplexed sub-channels could be large enough to compensate for the frequency variations caused by the Doppler effect.

The trial court found that Rault disclosed several of the limitations of independent claims 42, 56, and 68—the modulation means, the data reliability enhancement means, and the interleaving means. The district court did not find that Rault anticipated any of the claims, however, because the court found that Rault failed to disclose the limitation, found in the preamble of each of the independent claims, that referred to the use of the invention “in a confined multipath transmission environment.” The trial court construed

the words “in a confined multipath transmission environment” to mean “in an indoor environment.”

On appeal, Buffalo first argues that Rault anticipates the relevant claims of the '069 patent because the district court improperly construed the preamble language to constitute a limitation of each of the claims. CSIRO responds that Buffalo waived that argument by not raising it below. In response to the claim of waiver, Buffalo contends that it preserved the “preamble” argument because, in the course of the parties’ arguments over claim construction, it argued that the phrase “confined multipath transmission environment” should not be limited to an indoor environment. Instead, Buffalo argued, that term should embrace both indoor and outdoor environments that have defined or confined multipath transmission environments.

That argument, which was made by Buffalo in the district court with respect to claim construction, is quite different from the argument it now makes with respect to anticipation, i.e., that the recitation of “confined multipath transmission environment” in the preambles of the asserted independent claims is not a claim limitation that should be considered for purposes of anticipation. Before the district court, Buffalo could have argued both (1) that the phrase “confined multipath transmission environment” does not mean “indoor environment,” and (2) that, in any event, the environment of use defined in the preamble should not be treated as a separate limitation. But Buffalo made only the first argument. It has therefore waived the argument that the relevant language in the preamble does not limit the claims.

In the alternative, Buffalo argues that Rault anticipates the asserted claims even if the language in the preamble is treated as a limitation, because Rault discloses the

use of the invention in an indoor environment. In support of that argument, Buffalo first quotes language from Rault indicating that outdoor urban environments can be “hostile” and can pose multipath problems. Buffalo then notes that the '069 patent deals with multipath problems and concludes that “Rault disclosed communication techniques applicable to both indoor and outdoor environments.” The trial court considered that issue, however, and found as a factual matter that Rault’s discussion of outdoor environments did not anticipate the use of the patented technique in an indoor environment. Buffalo’s cursory assertion that the trial court was incorrect as to that ruling is not enough to overcome the “clear error” standard that applies to the factual finding that Rault does not disclose an indoor environment and therefore does not anticipate. Accordingly, we affirm the decision of the district court on that aspect of Buffalo’s anticipation argument.

III

Buffalo next contends that the asserted claims are anticipated based on the combination of two articles. One is an article by T.A. Wilkinson and S.K. Burton entitled “Spread Spectrum for Radio LANs,” which was published in May 1992 in an IEEE Colloquium on Radio LANs. The other is an article by J.A.C. Bingham entitled “Multicarrier Modulation for Data Transmission: An Idea Whose Time Has Come,” which was published in May 1990 in the IEEE’s Communications Magazine. Buffalo acknowledges that in the district court it did not argue obviousness based on the combination of those two references. For that reason, it has not argued in this court that the asserted claims would have been obvious based on the combination of those references. Instead, Buffalo argues anticipation based on those references; it contends

that the two references serve as the single reference that is required for anticipation, see Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1576 (Fed. Cir. 1991), because Bingham is incorporated by reference in Wilkinson.

To support its contention that Bingham is incorporated by reference, Buffalo cites Advanced Display Systems v. Kent State University, 212 F.3d 1272 (Fed. Cir. 2000). That case sets forth the rule as to when a document will be deemed incorporated by reference in another document for purposes of validity analysis. The Advanced Display Systems case states the following with respect to that issue:

Incorporation by reference provides a method for integrating material from various documents into a host document—a patent or printed publication in an anticipation determination—by citing such material in a manner that makes clear that the material is effectively part of the host document as if it were explicitly contained therein. To incorporate material by reference, the host document must identify with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents.

212 F.3d at 1282 (internal citations omitted). The court’s role in such cases is to decide “what material in addition to the host document constitutes the single reference” needed to serve as the basis for a finding of anticipation. Id. at 1283.

In pertinent part, Wilkinson describes “parallel [frequency hopping] . . . where multiple frequency slots are used simultaneously or COFDM could be used to achieve increased information rates.” At the point that Wilkinson refers to COFDM, it contains a footnote citation, without comment, to Bingham. The footnote citation in Wilkinson could provide a justification for combining the references for obviousness purposes, but there is nothing about the reference to Bingham that appears to constitute an incorporation of any or all of the information from the Bingham reference under the standard set forth in Advanced Display Systems. In particular, the reference to Bingham does not “identify

with detailed particularity what specific material it incorporates and clearly indicate where that material is found in the various documents.” Advanced Display Systems, 212 F.3d at 1282; see also Zenon Envtl., Inc. v. U.S. Filter Corp., 506 F.3d 1370, 1378 (Fed. Cir. 2007). Because Wilkinson does not incorporate Bingham by reference, we affirm the district court’s ruling that the combination of Wilkinson and Bingham does not anticipate the asserted claims of the ’069 reference. We do not reach the merits of the question whether each limitation of each asserted claim is disclosed by the combination of the two references.

IV

Buffalo next contends that the district court improperly granted summary judgment that the asserted claims of the ’069 patent are not invalid for obviousness.

A

Before the district court, Buffalo relied on a number of different combinations of references. On appeal, Buffalo focuses on two of them: the combination of the Rault article and the article by Wilkinson; and the combination of the Rault article and a U.S. patent to Fattouche entitled “Method and Apparatus for Multiple Access Between Transceivers in Wireless Communications Using OFDM Spread Spectrum.” In arguing that it introduced sufficient evidence on the issue of obviousness to avoid summary judgment, Buffalo relies principally on the declaration and report of its expert, David Bagby.

With respect to the combination of Rault and Fattouche, the district court faulted the Bagby declaration and report for offering “only conclusions” that those references disclose all of the elements of each of the claims and that all of the claims would have

been obvious. The court stated that “[t]here is no delineation as to what elements of the claims are absent from any particular one of the references that are supplied by the other reference in the combination of Fattouche and Rault.”

That criticism of Buffalo’s evidence is misplaced. Mr. Bagby’s report contains a limitation-by-limitation analysis of each of the claims and sets forth where each limitation of the claims is found in the various prior art references. Moreover, as the district court elsewhere acknowledged, CSIRO’s expert admitted that Rault discloses the modulation means, the data reliability enhancement means, and the interleaving means recited in independent claims 42, 56, and 68. The only limitation of the asserted independent claims that the district court found not to be disclosed in Rault was the “in a confined multipath transmission environment” (i.e., indoor environment) limitation. As to that limitation, however, CSIRO conceded, as the district court noted, that “Fattouche does disclose a system for use indoors.”

With respect to the combination of the two IEEE publications authored by Rault and by Wilkinson, the district court criticized Mr. Bagby’s analysis as “cursory.” The court stated that the evidence of motivation to combine the references was limited to the “common desire to deal with multiple propagation effects” and Mr. Bagby’s conclusion that it would be natural for one of skill in the art to combine the references because IEEE publications are primary sources of technical information. Invoking the so-called “teaching, suggestion, and motivation” (“TSM”) test, the district court held that the evidence was insufficient to show a sufficient teaching, suggestion, or motivation to combine those references. The court based its conclusion on the ground that there is “an important distinction between the general motivation to address a problem and the

motivation to create a particular solution to the problem.” According to the court, Buffalo did not “proffer[] specific evidence as to the source of a teaching, suggestion, or motivation to combine the prior art references.” What the court found lacking in Buffalo’s submission was “identification of any specific evidence in the combination of references (or anywhere else in the record) that suggests combining them in a manner that results in the claimed subject matter.”

B

Buffalo argues that the district court’s analysis of the evidence submitted on summary judgment and its reliance on the absence of any specific teaching, suggestion, or motivation to combine the prior art references was erroneous, particularly in light of the Supreme Court’s recent decision in KSR International Co. v. Teleflex Inc., 127 S. Ct. 1727 (2007). In KSR, which was decided after the district court entered its summary judgment order in this case, the Supreme Court criticized this court’s application of the TSM test for being unduly rigid. The KSR case involved the same kind of problem that is presented here—the question of obviousness as applied to an invention that consists of a combination of elements, all of which are found in prior art references. In that setting, the Court stated, a “combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” Id. at 1739.

In addressing the TSM test, the Supreme Court acknowledged that “it can 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,” but the Court warned against converting that inquiry into a “rigid and mandatory formula[.]”

KSR, 127 S. Ct. at 1741. The Court criticized this court's application of the TSM test as focusing only on the precise problem the patentee was trying to solve. Under the correct analysis, the Court wrote, "any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." Id. at 1742.

The Court further criticized this court for "its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem." 127 S. Ct. at 1742. To the contrary, the Court explained, "familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . . A person of ordinary skill is also a person of ordinary creativity, not an automaton." Id.

In light of the analytical framework set forth by the Supreme Court in KSR, the district court's analysis of the summary judgment dispute was flawed. As noted, the trial court found (and CSIRO's expert acknowledged) that Rault teaches all of the limitations of the independent claims except for use in an indoor environment. Moreover, Buffalo points out that Rault and Wilkinson both address the multipath problem, and that Wilkinson and Fattouche address solutions to that problem in an indoor environment. As Mr. Bagby explained in his report, although Wilkinson is principally directed to other methods of dealing with the multipath problem, it refers to dealing with that problem in "an indoor environment," and it specifically refers to the use of COFDM "to achieve increased information rates" in a radio frequency LAN where it is necessary to "combat severe multipath." Like Rault and Wilkinson, Fattouche addresses the multipath

problem, and like Wilkinson, it discloses the use of OFDM in a wireless LAN. Moreover, Fattouche expressly states that its system “can be used indoors as well as outdoors using the same transceivers.”

Buffalo argues that the suggestion to combine Rault with Wilkinson or Fattouche derives from the fact that all three references address the same problem: solving the multipath problem that affects wireless radio communications in hostile environments. In his declaration, Mr. Bagby pointed out that the common thread in each of those references “is the express focus[] on the specific area of multipath reflection problems in wireless communications,” which is “precisely the same problem that the ’069 Patent purports to solve.” Moreover, Mr. Bagby stated that Rault prescribes the use of “frequency division multiplexing, coding and/or interleaving to specifically mitigate the multipath problem” in the context of a wireless radio frequency communication. Accordingly, Mr. Bagby concluded, “it would be natural for one skilled in the art to combine these references.” Furthermore, Mr. Bagby stated that “multipath is an inherent aspect of radio signal propagation, whether indoor or outdoor.” Therefore, he concluded, the prior art solutions for mobile radio communications were equally applicable to indoor radio communications.

In defense of the district court’s summary judgment order, CSIRO argues that Mr. Bagby did not proffer sufficient specific evidence as to the source of a teaching, suggestion, or motivation to combine the cited references. CSIRO cites the declaration of its expert, Dr. Bantz, who stated that in his work on wireless LANs at IBM, the use of OFDM “was almost immediately dismissed . . . as unsuitable for an indoor wireless environment.” CSIRO further asserts that “the propagation of radio waves indoors is

very different than propagation out-of-doors, and was poorly understood” at the time of the invention. Because relatively low-speed outdoor radio applications were regarded as presenting a very different problem from indoor LANs requiring a high data rate, CSIRO contends that there would have been no reason to combine Rault with either Wilkinson or Fattouche. Accordingly, CSIRO argues, this is not a case “where there could have been a simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement.”

CSIRO’s argument is highly factual and underscores the factual nature of the dispute that is at the core of the obviousness issue presented in this case. While the ultimate question of patent validity is a question of law, the proper resolution of that ultimate question typically turns on underlying factual inquiries, including the scope and content of the prior art and the differences between the prior art and the claims at issue. See Graham v. John Deere Co., 383 U.S. 1, 17 (1966). CSIRO’s contention that the prior art deals with a problem that is not directly analogous to the problem facing the inventors of the ’069 patent is a factual question that has been put into issue by Mr. Bagby’s declaration and report and cannot be resolved on summary judgment.

CSIRO’s argument also fails to take sufficient account of the Supreme Court’s ruling in KSR that “any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” 127 S. Ct. at 1742. Buffalo introduced evidence that all of the references on which it relied were directed to solving the same problem—the multipath problem for wireless communication using radio frequencies. It also offered evidence that a person of ordinary skill in the art, seeking to solve that well-known problem, would

be motivated to look to references of the sort that Buffalo cited to the district court, including Rault, Wilkinson, and Fattouche. While CSIRO offered evidence to counter Mr. Bagby's declaration and report, the facts set forth in the competing expert presentations in this case cannot be resolved on summary judgment on the grounds invoked by the district court.

Even before KSR, this court had made clear that the motivation to combine particular references could be found in the nature of the problem to be solved. In re Gartside, 203 F.3d 1305, 1320-21 (Fed. Cir. 2000); Pro-Mold Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996) (motivation to combine "may also come from the nature of a problem to be solved, leading inventors to look to references relating to possible solutions to that problem"). In that regard, this court's decision in Cross Medical Products v. Medtronic Sofamor Danek, Inc., 424 F.3d 1293 (Fed. Cir. 2005), is instructive. In that case, as in this one, the district court granted summary judgment of nonobviousness over the accused infringer's objections. This court reversed the summary judgment, holding that there was sufficient evidence to create a triable issue of fact as to whether a person of ordinary skill in the art would have been motivated by the nature of the problem to combine references that offered ways to solve it. The problem in Cross Medical was that a particular surgical device used in back surgery was widely recognized as presenting difficulties to surgeons. That problem, the court held, "provided sufficient motivation to navigate the prior art in the spinal implant field in search of a teaching on how one might modify the [prior art] device" in the manner achieved in the patent. 424 F.3d at 1322. In the course of its discussion, the Cross Medical court rejected the argument that the problem addressed by the patent

differed somewhat from the problem encountered by surgeons who used the prior art device. “One of ordinary skill in the art,” the court wrote, “need not see the identical problem addressed in a prior art reference to be motivated to apply its teachings.” Id. at 1323.

In this case, the problem addressed by Rault, Wilkinson, and Fattouche was the same, or at least quite similar—the multipath problem encountered by systems of radio frequency communications in hostile environments. All of the references addressed the problem and suggested the use of an OFDM-based system to solve the problem. Wilkinson involved indoor applications and suggested the use of COFDM to achieve high rate communications in a very hostile environment; Fattouche suggested the use of OFDM for indoor wireless communications between transceivers, and Rault suggested the combination of COFDM and the other elements of the invention in a hostile urban environment. As in Cross Medical, the problems addressed by the references are sufficiently similar to the problem presented by high-speed indoor wireless LANs that there is a factual question whether a person of skill in the art would have looked to the teaching of those references in seeking to solve the multipath problem for a wireless indoor LAN. See In re Translogic Tech., Inc., 504 F.3d 124, 1262 (Fed. Cir. 2007) (“court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ”; a person of ordinary skill in the art “would have solved this design need by pursuing known options within his or her technical grasp”); In re Dillon, 919 F.2d 688, 694 (Fed. Cir. 1990) (en banc) (a reference is not from non-analogous art if “the reference is reasonably pertinent to the particular problem with which the inventor was involved”). Thus, as in Cross Medical, there is a factual issue as to the motivation

to combine prior art references that requires that we vacate the district court's order of summary judgment with respect to obviousness.

C

CSIRO makes several alternative arguments in support of summary judgment, arguments that the district court did not address. First, CSIRO argues that the secondary considerations addressed in its experts' declarations show that the claims of the '069 patent would not have been obvious. In Graham, the Supreme Court held that secondary considerations such as "commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented" and "may have relevancy" as indicia of obviousness or nonobviousness. 383 U.S. at 17-18.

In his declaration, CSIRO expert David Bantz stated that while he was with IBM in 1988, he worked on the problem of an indoor wireless connection for computers and that neither his group nor others working in the field came up with the solution that CSIRO invented. He added that he was surprised that CSIRO had "approach[ed] the problem through the use of OFDM, an approach rejected by IBM and by every other company of which I was aware," and he concluded that CSIRO had "hit on the solution that so many others, including IBM, had tried but failed to find." A second CSIRO expert, Allen Levesque, summarized several approaches that had been tried in the field of wireless LANs by the early 1990s and concluded that there had been "considerable, but ultimately unsuccessful efforts expended by leading technical organizations attempting to meet the need for an effective wireless alternative to traditional cabled LANs."

The secondary consideration evidence offered by CSIRO's experts would be useful to a trier of fact in determining whether the invention of the '069 patent would have been obvious to a person of ordinary skill at the time of the invention, as we have recognized that such evidence "constitutes independent evidence of nonobviousness." Ortho-McNeil Pharm., Inc. v. Mylan Labs., 520 F.3d 1358, 1365 (Fed. Cir. 2008); see also Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579 (Fed. Cir. 1997). But it does not justify the entry of summary judgment in CSIRO's favor in light of the evidence Buffalo introduced as to the primary considerations bearing on obviousness. That is particularly true in light of the fact that Buffalo offered evidence explaining why those seeking to devise high-speed wireless LANs in the early 1990s did not succeed. Buffalo's expert stated that those working on such projects were constrained by market considerations requiring, for example, that wireless LAN adaptors be usable with personal computers and thus be relatively inexpensive. Because of the state of the art of silicon process development, Buffalo's expert stated that LANs operating at high frequencies were not commercially attractive at that time. Moreover, he explained that in the United States in the early 1990s, limitations on the use of desirable portions of the radio spectrum discouraged the development of wireless LAN systems. The secondary consideration evidence, like the evidence with regard to the primary considerations, thus presents factual issues for a trier of fact.

CSIRO also argues that Buffalo failed to show that the prior art references disclosed the elements of the asserted claims in the same order that they appeared in the claims and that the references failed to disclose the particular structures corresponding to the means-plus-function limitations in the asserted claims. While the

district court did not address that issue, we note that Rault on its face appears to contemplate a structure having the disclosed elements in the same order as in the asserted claims. In Rault's diagram of a receiver according to the described structure, Rault depicts a demodulator, a deinterleaver, and data reliability enhancement mechanisms, in that order. The reverse sequence of structures in the corresponding transmitter would be lined up in exactly the order recited in the asserted claims of the '069 patent.

Next, CSIRO argues that Buffalo's references do not "show structure corresponding to the structure found for the means-plus-function elements of the patent." CSIRO is apparently referring to the structures disclosed in the specification of the '069 patent that correspond to the modulation means, the data reliability means, and the interleaving means. One of the inventors testified, however, that interleaving, multi-level modulation, and data reliability enhancement in the form of forward error correction were all well known in the art at the time of the invention. He added that the elements that performed those functions in the system of the invention were also known in the art. In its brief to the district court, CSIRO made the same admission, acknowledging that "[t]he Wireless LAN system disclosed in the '069 patent is comprised of a variety of elements, all of which were known in the prior art." Furthermore, Mr. Bagby stated that the structures disclosed in Rault corresponded to the structures described in the '069 patent, and CSIRO offered no contrary evidence on that issue. Finally, CSIRO's argument is seemingly at odds with the representation of its own expert, Peter Molsen, who characterized each of those limitations as having been disclosed in Rault. The summary judgment therefore cannot be sustained on this ground.

CSIRO's last contention is that even if Buffalo has shown that the independent claims would have been obvious, it has not made that showing in the case of the dependent claims. Mr. Bagby presented a limitation-by-limitation analysis of the dependent claims as well as the independent claims. CSIRO's showing in the district court with respect to the dependent claims consisted principally of a claim chart in which its expert asserted, without elaboration, that various limitations of the independent and dependent claims were not found in particular references. The district court did not address the dependent claims at all in connection with the obviousness summary judgment order. In light of the absence of any discussion of the dependent claims by the district court and in light of the conflicting expert evidence as to the dependent claims, we are not prepared to hold that the record at this point supports a summary judgment of nonobviousness as to those claims.

In sum, we conclude that the evidence offered by Buffalo created a genuine issue of material fact as to whether there was a motivation to combine prior art references dealing with the multipath problem and whether the combination of those prior art references disclosed all of the limitations of the independent claims of the '069 patent. We therefore vacate the district court's summary judgment of nonobviousness and remand for further proceedings on that issue.

V

Buffalo next argues that the applicant for the '069 patent impermissibly added new matter to the application, in violation of 35 U.S.C. § 132, when the applicant amended the application on July 3, 1995, and that the asserted claims of the '069 patent, all of which were first added to the application at that time, are invalid under the

prohibition against adding new matter, which this court enforces under 35 U.S.C. § 112, ¶ 1, because the claims are not supported by the disclosure in the original application.

As originally filed, the application identified the invention as relating to a wireless LAN “in which the devices communicate by way of radio transmissions.” Several statements in the specification, however, referred to radio transmissions at frequencies “in excess of 10 GHz,” and the claims were limited to transmissions in that frequency range.

The 1995 amendment to the application replaced several of the references to frequencies in excess of 10 GHz with the words “radio frequencies.” The effect of the change was to increase the range of frequencies specifically referenced by the affected passages from radio frequencies in excess of 10 GHz to frequencies ranging from 3 KHz to 300 GHz, which the parties agree is the conventional understanding of the range of “radio frequencies.” The same amendment added new claims, including the claims asserted in this case, that did not contain references to frequencies in excess of 10 GHz. Instead, the new claims referred to transmissions at “radio frequencies.”

Buffalo argues that the effect of those changes was to broaden the disclosure of the patent, thereby improperly adding new matter to the application, in violation of section 132. As a consequence, Buffalo contends that the new claims that were introduced at that time are invalid in light of the written description requirement of section 112, paragraph 1.

The question presented by this issue is whether the specification of the original application contained a written description of the invention sufficient to allow persons of ordinary skill in the art to recognize that the inventor invented the subject matter that is

claimed in the asserted claims. Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 993 (Fed. Cir. 1999).¹ If it did not, the legal consequences would be that the 1995 amendment would be considered to have added new matter to the application, and the newly added claims would not be supported by the original specification.

While Buffalo has asserted both “new matter” and “written description” violations, the two issues turn on a single question in this case: whether the 1995 amendment to the specification broadened the disclosure of what the inventors invented. As Buffalo acknowledges, “Whether you call this a written description issue or a new matter issue, you end up at the end of the day at the same point. And it is really the same analysis as to what happened.” Because the first question in the inquiry is whether the amendment to the specification added new matter to the application, and because the disposition of the written description issue turns on the answer to that question, we address Buffalo’s argument under the rubric of new matter.

The question whether new matter has been added to an application is a question of fact. Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1574 (Fed. Cir. 1992). As noted above, the trial court was authorized by the parties to act as the finder of fact with regard to any disputed facts relating to the section 132 validity issue.

¹ Quoting from the district court’s opinion, Buffalo argues that the court applied the wrong standard to this issue, requiring Buffalo to show that the disclosure contained a clear statement restricting the scope of the invention. While it is true that the district court at one point employed language suggesting the use of that more restrictive standard, other references throughout the court’s lengthy treatment of the issue demonstrate that the court understood and applied the correct standard. At the outset of its discussion of the issue, for example, the court correctly stated that “[i]n order to satisfy the written description requirement, the disclosure of the application for the ’069 patent must reasonably convey to one skilled in the art that the inventors were in possession of the claimed subject matter to the extent of the scope of the asserted claims.”

The district court made a reference to the absence of any genuine issue of material fact, which calls into question whether the court regarded the issue as presented to it as fact-finder or presented as a summary judgment issue. Immediately after that reference, however, the court made the following statement: “Buffalo has failed to demonstrate by clear and convincing evidence that the written description of the Australian application could not or does not reasonably convey to one of skill in the art that the inventors were in possession of the claimed subject matter of the asserted claims.” In light of that statement, we interpret the court’s action as constituting a ruling on the section 132 issue on both legal and factual grounds, including making findings of fact based on the evidence submitted to the court, as the court was permitted to do by the parties’ stipulations. We therefore review the district court’s new matter ruling under the clear error standard.

Moreover, in the context of a validity challenge based on new matter, the fact that the United States Patent and Trademark Office (“PTO”) has allowed an amendment without objection “is entitled to an especially weighty presumption of correctness” in a subsequent validity challenge based on the alleged introduction of new matter. Brooktree, 977 F.2d at 1574-75 (citations omitted). Buffalo therefore not only must overcome the clear error standard, but it must do so in the face of a presumption of validity based on the PTO’s issuance of the patent despite the amendments.

Viewed in isolation, the substitution of the references to “radio frequencies” in place of the references to the minimum transmission frequency of 10 GHz in the original application is suggestive of a broadening of the disclosure. Reviewing the application as a whole, however, we conclude that there is enough material in the original

disclosure to support the district court's finding that the invention was in fact broader than systems operating only in the frequency range "in excess of 10 GHz."

At the outset, it is important to note that no one has suggested that the 10-GHz minimum reflects a distinction that has any technical significance. Nor has Buffalo sought to show that transmissions above 10 GHz and transmissions below 10 GHz are distinct in any way relevant to patentability. To the contrary, it is apparent from the original application itself that the references to the 10-GHz minimum transmission frequencies were presented as useful embodiments of the invention, not as limitations to the invention as a whole. For example, the reference in the abstract to a "wireless transceiver and method of transmitting data, all of which are capable of operating at frequencies in excess of 10 GHz" (emphasis added) suggests a system that has the capacity to operate at those frequencies, not one that is limited to that frequency range. Similarly, each of the references to transmission of radio frequencies "in excess of 10 GHz" in the portion of the specification that was amended were in the context of descriptions of particular embodiments of the invention. Those passages do not make express reference to lower transmission rates, but they also do not express a limitation on the scope of the invention.

Importantly, even in the original specification the references to frequency range were not limited to frequencies in excess of 10 GHz. There is one explicit reference in the original specification to a transmission rate of less than 10 GHz. The application refers to the need to "have a relatively high transmission rate and therefore transmit on a relatively high frequency, of the order of 1 GHz or higher." That reference provides explicit support for a lower transmission rate, at least down to the order of 1 GHz. That

reference also makes clear that the choice of high frequency is simply a preference, in light of the higher transmission speeds available at that frequency, not a requirement driven by some limitation on the capacity of the invention.

A more subtle allusion to a different frequency range is found in Figure 6 of the '069 patent, which was present in the original application. That figure contains a reference to an output of 2-3 GHz, which is then combined with a carrier wave having a frequency of 58 GHz to produce a broadcast frequency of 60-61 GHz for external transmission. Figure 6 does not directly disclose a sub-10-GHz transmission system, but it would appear to be clear to a person of ordinary skill in the art that the step up in frequency from 2-3 GHz to 60-61 GHz is an optional step that is separate from and not essential to the operation of the invention. That is, Figure 6 can be viewed as disclosing two discrete pieces of equipment, the first operating at 2-3 GHz and the second consisting of a standard frequency step-up device that operates at a higher frequency. Viewed in that manner, Figure 6 supports CSIRO's argument that the invention described in the original application was not confined to a frequency range in excess of 10 GHz.

The testimony of Buffalo's expert, Mr. Bagby, provides additional support for concluding that the district court did not commit clear error in its resolution of the new matter issue. Mr. Bagby admitted that Figure 6 discloses to a person of ordinary skill in the art that one would not need to step up the transmission rate to 61 GHz, but instead could transmit at much lower rates, as long as the carrier frequency stayed at or above 2-3 GHz, which is the output of the transmitter that is at the heart of the invention. In fact, Mr. Bagby admitted that one skilled in the art "would understand from [Figure 6]

that if you wanted to you wouldn't have to step it up at all and you could simply transmit at 2 to 3 GHz if sufficient bandwidth were available to do that." In response to a question whether one could transmit at the 2.4 GHz ISM band by using Figure 6 "and simply eliminating the step-up/step-down oscillator," he stated, "It's a possibility." And in response to the ultimate question whether Figure 6 "disclose[s] the fact that this invention can be used at less than 10 GHz," Mr. Bagby responded, "If there is sufficient bandwidth, then this is a possibility."

It is true that Mr. Bagby later stated that he believed the originally filed application was "intended to be 10 GHz and up," but that later statement merely refers to the express contents of the original application; it does not undermine Mr. Bagby's earlier testimony that one of ordinary skill in the art would understand from the original application that it discloses an invention that is operable at lower frequencies. Moreover, that is the way the trial court understood and characterized Mr. Bagby's statement. The court observed that Mr. Bagby's statement "does not address the question as to what the statement in the [original] application would mean to one skilled in the art in regard to whether the inventors were in possession of the subject matter of the asserted claims" and that Mr. Bagby's statement "does not indicate that one skilled in the art would necessarily understand the statement in the Australian application and the teaching to use OFDM as a solution to multipath to mean that the inventors were addressing a problem that only occurs at frequencies in excess of 10 GHz." In its capacity as fact-finder, the trial court was justified in relying in part on Mr. Bagby's admissions to conclude that the original application disclosed an invention that could operate below 10 GHz.

Significantly, CSIRO's expert, Dr. Andrews, testified that one of skill in the art would understand from the original specification that the inventors of the '069 patent had invented, were in possession of, and had described a digital communication technique "that could be operated successfully over the radio spectrum, including frequencies over 10 GHz and frequencies down below even 1 GHz." Dr. Andrews explained that the techniques described in the patent were frequency independent and therefore that there is no reason a person of skill in the art would expect them to operate differently at frequencies above 10 GHz than at lower frequencies within the radio portion of the electromagnetic spectrum.

Finally, as additional support for its finding on the new matter issue, the district court relied on the testimony and publications of the inventors to find that they were in possession of and had described an invention that was not limited to operation at frequency levels above 10 GHz. Inventor O'Sullivan testified that in the work that led up to the patent application the inventors had "proposed experimentation at 40 [GHz]" and "demonstrated measurements at 2.4 GHz," and that "the testbed developed actually operated initially at 2.4 [GHz]." The court also referenced a publication co-authored by two of the inventors that discussed choosing 60 GHz as the transmission frequency because "[n]one of the bands below 60 GHz has more than 100 MHz available and are in congested parts of the spectrum where expansion is not possible. Therefore, these are not likely candidates for use in a high-speed WLAN system." The court found that the "inventors' testimony is clear [with respect to the references to 10 GHz] that they were only attempting to identify an area of the radio frequency spectrum where there was sufficient bandwidth available for the higher data rates sought. The inventors'

testimony does not compel a conclusion that they were in possession of an invention that only worked at frequencies in excess of 10 GHz.” Thus, acting as finder of fact, the district court concluded that the inventors were in possession of and had described an invention that was not limited to operation above 10 GHz and that a person of ordinary skill would not interpret the original application to be so limited.

For the reasons given above, we uphold the district court’s ruling refusing to invalidate the asserted claims based on the alleged improper addition of new matter to the application. Buffalo has not offered a sufficient basis for us to conclude that the district court’s finding on that issue was clearly erroneous and thus has failed to overcome the demanding burden imposed on it by the applicable standard of review.

VI

Buffalo next challenges the district court’s finding that it infringed claims 42-48, 56-60, and 68-72 of the ’069 patent. In so doing, Buffalo focuses on the means-plus-function limitations that recite “means to apply data reliability enhancement” and “means for interleaving blocks of said data.” Those limitations are found in independent claims 42 and 56 as well as in their dependent claims. Claim 68 and its dependent claims are method claims and do not contain means-plus-function limitations, although they each contain limitations closely analogous to the means-plus-function limitations at issue.

A

Under section 112, paragraph 6, of the Patent Act, 35 U.S.C. § 112, ¶ 6, a patentee may express an element in a claim as a means for performing a specified function without reciting the particular structure that performs the recited function. In such a case, the “means-plus-function” limitation “must be construed to cover the

corresponding structure, material, or acts described in the specification and equivalents thereof. Literal infringement of a section 112, paragraph 6, limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification.” Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1266-67 (Fed. Cir. 1999) (internal citations and quotations omitted).

The district court construed one of the means-plus-function limitations of the asserted independent claims—the “means to apply data reliability enhancement” limitation—as corresponding to the “[r]ate ½ TCM (trellis coded modulation) encoder described in block 42 of Figure 7 and references at 6:32-46” of the ’069 patent. Buffalo does not dispute that its accused devices perform the function recited in that limitation. Thus, the question for infringement purposes is whether the devices have a structure that is identical or equivalent to the structure disclosed in the specification. Buffalo argues that its devices contain “convolutional encoders,” which are not the same as, or equivalent to, the structure identified in the specification of the ’069 patent.

As noted by Buffalo’s own expert, Mr. Lanning, the rate ½ TCM encoder discussed in the ’069 patent has two sub-components, each of which performs a distinct function. The first is a convolutional encoder, which the parties agree performs the data reliability enhancement function of the means-plus-function limitation. The second subcomponent performs what the parties have referred to as signal mapping. Buffalo argues that the functions of the two subcomponents of the rate ½ TCM encoder are inseparable and therefore if its accused products do not perform both functions of the encoder as a whole, then the devices do not infringe the claims. Mr. Lanning, however,

conceded that the subcomponents and their functions are distinct. He explained that after generating the convolutional encoder output, “[t]hen you have to generate the TCM output. [Convolution encoding] is only the first step in the process . . . only the start. The TCM encoding then takes place on the output of the Convolution Encoder, as well as considering other input bits that have not come from the Convolution Encoder.” Because the second subcomponent of the rate $\frac{1}{2}$ TCM encoder receives output from the first subcomponent and then processes that input, the two subcomponents are properly viewed as separable and distinct, even though the patent describes them as performed by a single device. Therefore, Buffalo is essentially arguing that its products do not infringe because its convolutional encoders are not coupled to a second subcomponent that performs signal mapping.

Buffalo does not avoid infringement simply because the device disclosed in the patent subsequently performs a function distinct from that required by the data reliability enhancement means limitation. With respect to that function, Buffalo has not offered any reason to conclude that the convolutional encoder in its products is not identical or equivalent to the convolutional encoder that is part of the data reliability enhancement means described in the patent. Although the trial court stated that the rate $\frac{1}{2}$ TCM encoder corresponds to the data reliability enhancement means, it is clear from the court’s discussion of the issue that it was comparing the separable convolutional encoding subcomponent of the disclosed rate $\frac{1}{2}$ TCM encoder to the accused devices.

As part of its argument, Buffalo points out that, in an embodiment disclosed in the ’069 patent, the output of the rate $\frac{1}{2}$ TCM encoder is sent to a quadrature phase-shift keying encoder by way of an interleaver. ’069 patent, col. 2, ll. 38-41, Figure 7. Buffalo

then points to the testimony of Mr. Lanning to argue that the patented device would not work properly if Buffalo's convolutional encoder were used in place of the rate $\frac{1}{2}$ TCM encoder, which includes the signal mapper. That argument, however, simply restates the point that Buffalo's convolutional encoder differs from the rate $\frac{1}{2}$ TCM encoder in that the latter contains both a convolutional encoder and a signal mapper. Buffalo does not argue that there is any relevant difference between its convolutional encoder and the convolutional encoding subcomponent of the TCM encoder. Nor does Buffalo dispute that if one were to add a signal mapper to its device connected serially to its convolutional encoder, it would provide an appropriate output to the interleaver and the quadrature phase-shift keying encoder. The district court therefore properly concluded that the accused devices contain structure that performs the data reliability enhancement function of that means-plus-function limitation and that the structure that performs that function in the accused devices is identical or equivalent to the structure described in the '069 specification.

B

Buffalo's second non-infringement argument is that its devices do not have structure that performs the "means . . . for interleaving blocks of said data" as required by the asserted claims. Buffalo concedes that its products perform bit-by-bit interleaving. It contends, however, that the trial court erred in construing "blocks of data" to mean "blocks of data having one or more bits." Buffalo contends that under the normal meaning of the term "block," a "block of data" consists of two or more bits and that to construe a block of data as consisting of one or more bits impermissibly reads the term "block" out of the claims. We disagree. There is no suggestion in the use of

the term “block of data” that the data must be contained in a plurality of subparts or components. While in ordinary parlance, a “block” is generally considered to be a group acting or treated as a unit, even in that context there is no requirement that every “block” or group contain multiple members (for example, the independent block in the U.S. Senate currently consists of one Senator). In the context of computer engineering, the term “block of data” typically refers to any unit of data that is the subject of some operation; it is irrelevant to the definition of “block” whether it consists of a single bit or many. For example, the IBM Dictionary of Computing (10th ed. 1993), defines the term “block” to include “one or more records” or “one or more logical records.” Id. at 67. Therefore, in this context, a block of data is most reasonably understood to consist of one or more bits. Nor does the fact that the patent describes a di-bit interleaver and the interleaving of data in two-bit blocks mean that the claims must be limited to devices that interleave blocks consisting of at least two bits.² See Ventana Med. Sys. v. Biogenex Labs., Inc., 473 F.3d 1173, 1181 (Fed. Cir. 2006) (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

In any event, CSIRO points out that the '069 patent discloses an embodiment employing binary phase shift keying (“BPSK”), which it contends requires single-bit interleaving. '069 patent, col. 9, line 29, through col. 10, line 2. Buffalo’s expert conceded that BPSK requires single bit interleaving. In its reply brief, Buffalo appears to agree that the BPSK embodiment requires single-bit interleaving: “Although the

² Buffalo does not contend that the '069 patent is limited to the described embodiment using pairs of bits. For example, Buffalo seems to agree that a device interleaving blocks of four bits would infringe the claims.

BPSK embodiment described in the dependent claims would be combined with a single-bit interleaver, the dependent claims cannot broaden the corresponding structure for the ‘means . . . for interleaving blocks of data.’” Because the evidence indicates that a BPSK embodiment discloses a single bit interleaver (and thus single-bit blocks), we conclude that the specification supports the district court’s construction of the term “blocks of data” to refer to data packets consisting of one or more bits of data. We therefore sustain the trial court’s decision construing the term “blocks of data” to refer to data consisting of one or more bits.

Buffalo next argues that its products do not infringe because they use single-bit interleavers, which are not the structural equivalents of the di-bit interleavers disclosed in the specification. In response to that argument, the district court referred to what appears to be uncontroverted evidence from the declaration of CSIRO’s expert, Dr. Monsen, that “interleavers that handle different block sizes are insubstantially different.” Instead of arguing that the di-bit and single-bit interleavers are somehow significantly different devices, Buffalo instead argues that the type of interleaving performed is different. In doing so, however, Buffalo is simply returning to its argument about the appropriate construction for the term block size. The proper inquiry is whether there are insubstantial differences in the way that the interleavers operate on data and the result that is obtained. Based on the uncontroverted evidence, the district court permissibly concluded that the accused device and the structure in the patent interleave data in substantially similar manners and produce the same result: interleaved blocks of data. We therefore uphold the trial court’s finding of infringement.

Buffalo challenges the district court's decision to enter a permanent injunction in this case, and several amici have filed briefs supporting and opposing the issuance of injunctive relief rather than remitting CSIRO to its legal remedy of an award of damages. Because we are remanding this case to the district court for further proceedings on the issue of obviousness, we do not reach the question whether the entry of a permanent injunction constituted an abuse of discretion.

Each party shall bear its own costs for this appeal.

AFFIRMED IN PART, VACATED IN PART, and REMANDED.

United States Court of Appeals for the Federal Circuit

2007-1449

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION,

Plaintiff-Appellee,

v.

BUFFALO TECHNOLOGY (USA), INC.
and BUFFALO, INC.,

Defendants-Appellants.

Appeal from the United States District Court for the Eastern District of Texas
in case no. 2:05-CV-53, Judge Leonard Davis.

LOURIE, Circuit Judge, concurring.

I join the court's opinion and concur in its judgment on the basis of the thorough analysis by Judge Bryson and the standard of review by which we review district court decisions. However, the case is very close and there is a sound basis for an alternative conclusion, viz., that the patent is invalid for violation of the prohibition against introduction of new matter. I believe it is worthwhile to briefly note that alternative basis.

The written description of the patent states that the radio transmissions at which the claimed wireless LAN operates are at > 10 GHz. Figure 6 does not disclose otherwise, and testimony indicated that it was a mere "possibility" that the invention could be used at less than 10 GHz. However, by amendment, applicants cancelled portions of the specification that stated that the transmissions of the invention occur at > 10 GHz, leaving only one such reference and substituting other paragraphs stating that the invention operates "at radio frequencies." The granted patent eventually contained claims reciting "at radio frequencies," not limited to "in excess of 10 GHz."

The patentees have now asserted such broader claims against transceivers that apparently would not infringe the original, more limited claims.

The new matter statute, 35 U.S.C. § 132, provides that “[n]o amendment shall introduce new matter into the disclosure of the invention.” In my view, given the total record in the case, it would be reasonable to conclude that applicants changed the nature of the specification by amendment from one describing their invention as being one operating at > 10 GHz to one lacking that limitation. Such a change could well be viewed as the introduction of new matter that invalidates the patent.

Notwithstanding the above, given the fact that the district court found otherwise, and the court’s persuasive analysis, I join the court, having noted what I believe is a reasonable alternative view.