United States Court of Appeals for the Federal Circuit

2007-1314, -1467

THE CHAMBERLAIN GROUP, INC.,

Plaintiff-Appellee,

and

JOHNSON CONTROLS INTERIORS LLC,

Plaintiff-Appellee,

v.

LEAR CORPORATION,

Defendant-Appellant.

Donald R. Dunner, Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P, of Washington, DC, argued for plaintiffs-appellees. With him on the brief for Johnson Controls Interiors LLC, were Don O. Burley and Kara F. Stoll. Of counsel on the brief were Philip J. Kessler, J. Michael Huget, and Deborah Swedlow, Butzel Long, of Ann Arbor, Michigan. On the brief for the Chamberlain group, Inc. were Karl R. Fink, Rudy I. Kratz, and Nicholas T. Peters, Fitch, Even, Tabin & Flannery, of Chicago, Illinois.

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Appealed from: United States District Court for the Northern District of Illinois

Senior Judge James B. Moran

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LEAR CORPORATION,

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Appeal from United States District Court for the Northern District of Illinois in case no. 05-CV-3449, Senior Judge James B. Moran.

DECIDED: February 19, 2008

Before RADER, Circuit Judge, CLEVENGER, Senior Judge, and DYK, Circuit Judge.

RADER, Circuit Judge.

The Chamberlain Group, Inc. (Chamberlain) owns U.S. Patent No. 6,154,544 ('544 patent), an invention that improves security in garage door openers. Chamberlain and Johnson Controls Interiors LLC (JCI), Chamberlain's exclusive licensee with respect to development of radio frequency transmitters for sale to automotive original equipment manufacturers, sued Lear Corp. (Lear), charging Lear's Car2U transmitter with infringement of claim 4 of the '544 patent. After a Markman hearing, a claim construction order, Chamberlain Group, Inc. v. Lear Corp., No. 1:05-CV-03449 (N.D. Ill.

Sept. 11, 2006) (Initial Markman Order), and a modified claim construction order, Chamberlain Group, Inc. v. Lear Corp., No. 1:05-CV-03449 (N.D. Ill. Feb. 20, 2007) (Modified Markman Order), the United States District Court for the Northern District of Illinois issued a preliminary injunction, Chamberlain Group, Inc. v. Lear Corp., No. 1:05-CV-03449 (N.D. Ill. Mar. 30, 2007) (Preliminary Injunction Order). The trial court, however, stayed that injunction for Lear's contracts with General Motors Corp. Chamberlain Group, Inc. v. Lear Corp., No. 1:05-CV-03449 (N.D. Ill. Apr. 25, 2007) (Partial Stay Order). Because the district court erred in construing the claim term "binary code," this court reverses the district court's claim construction, vacates the preliminary injunction, and remands.

I

The remote-control garage door opening systems claimed in the '544 patent comprise a transmitter (generally integrated into a vehicle's visor or rearview mirror) and a receiver (usually attached to a mechanical device that operates the garage door). The transmitter and receiver communicate via an encrypted signal on a radio frequency (RF) carrier. In the claimed invention, part of the signal changes with each transmission (rolling or variable code). The rest of the signal remains fixed (fixed code). The receiver compares the transmitted fixed code and the rolling code with stored codes to activate the door opener.

The '544 patent improved the prior art of remote-control garage doors with an enhanced encryption system to make cracking the code more difficult for would-be techno-burglars. Specifically, asserted claim 4, and claims 1 and 3 from which it depends, recites the generation and transmission of a “trinary code” to encrypt the transmitted signal:

Claim 1:

A transmitter for sending an encrypted signal to control an actuator, comprising:

> oscillator for generating a radio frequency oscillatory signal;
>
> apparatus for enabling the sending of an encrypted signal;
>
> binary code generator responsive to the enabling apparatus for generating a variable binary code, said variable code being different for each enabling by the enabling device;
>
> trinary code generator for generating a three-valued or trinary code responsive to the variable binary code; and
>
> transmitting apparatus for modulating the radio frequency oscillatory signal with the trinary code to produce a modulated trinary coded variable radio frequency signal for operation or control of a secure actuator.

Claim 3:

A transmitter for sending an encrypted signal to control an actuator according to claim 1, comprising apparatus for producing a fixed code signal and for combining said fixed code signal with a rolling code signal.

Claim 4:

A transmitter for sending an encrypted signal to control an actuator according to claim 3, comprising apparatus for interleaving trinary bits derived from said fixed code signal with trinary bits derived from said rolling code signal to produce a trinary interleaved fixed and rolling code signal.

’544 patent col.9 l.56–col.10 l.4, col.10 ll.10-18. Claim 4 itself includes the additional feature of producing a trinary code signal comprising trinary bits derived from both a fixed code and a rolling code, interleaved together.

The key claim construction issue on appeal is the interpretation of the word “code” as it is used in the ’544 patent. The district court construed four terms that require an understanding of "code": "binary code" (claim 1), "binary code generator" (claim 1), "trinary code generator for generating a three-valued or trinary code responsive to the variable binary code" (claim 1), and "apparatus for producing a fixed code signal and for combining said fixed code signal with a rolling code signal" (claim 3). Initial Markman Order at 5-11. Although the district court did not construe it, the meaning of "trinary code" is also relevant to construing "code" and ultimately to understanding "binary code," since "binary" and "trinary" are themselves closely related terms and presumptively modify "code" in parallel ways.

The district court defined "binary code" as "a code in which each code element may be either of two distinct kinds of values, which code may represent various kinds of letters and numbers including, but not limited to, a representation of a base 2 number." Id. at 8. On Lear's motion for reconsideration, the district court clarified that "'binary code' cannot encompass trinary code." Modified Markman Order at 4. As for "trinary code," this term is defined to some extent by the specification as a "three-valued" code. See '544 patent, col.9 ll.66-67 (claim 1); see also id. col.3 ll.23-25.

On Chamberlain's motion for a preliminary injunction, the district court applied its definitions of "binary code" and the other disputed terms to Lear's Car2U transmitter. Lear characterized its transmitter as using only trinary numbers and trinary algorithms, therefore operating in trinary code rather than binary code. The district court noted that while Lear's Car2U code might represent a trinary number, Lear conceded that this trinary number is still represented as 0s and 1s in a computer. Preliminary Injunction Order at 6. Indeed, the parties agree that all computers necessarily operate in "binary code." In other words, microprocessors and memory devices use low and high voltages to manipulate, transmit, receive, and store vast amounts of data. A low voltage represents a 0, while a high voltage represents a 1. Thus the district court characterized Lear's trinary number, as represented in a computer, as a "binary-coded trinary number." Id. at 7. On this basis, the court concluded that Lear's accused Car2U transmitter would likely satisfy the "binary code" limitation. Id. at 6-7. Also, according to the district court, Lear admitted that its product generated trinary code, so the district court likewise concluded that Lear's binary and trinary codes had to be generated by binary code generators and trinary code generators, making it likely that Lear's product met the "binary code generator" and "trinary code generator" limitations. Id. at 7. Further finding that Lear likely met the "fixed code" limitation of claim 3, the district court concluded that Chamberlain would likely prevail on the merits of its infringement claim. Id. at 8-9. From there, the district court evaluated the remaining parts of the traditional four-factor test for injunctive relief, see eBay, Inc. v. MercExchange L.L.C., 126 S. Ct. 1837, 1839 (2006), and imposed a preliminary injunction on Lear, Preliminary Injunction Order at 9-14 (as modified by Partial Stay Order).

II

This court reviews claim construction as an issue of law without deference. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1451 (Fed. Cir. 1998) (en banc). To construe a claim term, the trial court must determine the meaning of any disputed words from the perspective of one of ordinary skill in the pertinent art at the time of filing. Intrinsic evidence, that is the claims, written description, and the prosecution history of the patent, is a more reliable guide to the meaning of a claim term than are extrinsic sources like technical dictionaries, treatises, and expert testimony. Phillips v. AWH

Corp., 415 F.3d 1303, 1318-19 (Fed. Cir. 2005) (en banc). Although it is unacceptable to import limitations into a claim from the written description, "the specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" Id. at 1315 (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

A

The district court defined "binary code" in the '544 patent as "a code in which each code element may be either of two distinct kinds of values, which code may represent various kinds of letters and numbers including, but not limited to, a representation of a base 2 number." Initial Markman Order at 8. The trial court also explained that "binary code" can encompass not only binary numbers, but also other numbers or symbolic designations that are represented in a system using two types of values (e.g., 0s and 1s). See id. at 6-8. In other words, "binary code" refers to the basic form for computer expression or storage of a given number or term, rather than its meaning. Under the district court's interpretation, "binary code" could serve as a medium to express binary (base 2) numbers (0, 1, 10, 11, 100, etc.), trinary (base 3) numbers (0, 1, 2, 10, 11, etc.), decimal (base 10) numbers (0, 1, 2, 3, 4, etc.), or any other base for that matter, by aggregating individual bits into combinations representing higher-based numbers.

Thus for the district court, Lear's "binary-coded trinary numbers" were binary code, not trinary code. The significance of this distinction depends on an examination of the operation of binary and trinary number systems in a computer. For example, the trinary numbers 0, 1, and 2 can be represented in binary code using pairs of bits 00, 01, and 10, respectively. Rather than reading each individual bit as representative of a power of 2, as with binary numbers, the computer must recognize each pair of bits as representing a power of 3. In a computer, as a further example, the decimal number 4, equivalent to the binary number 100 and the trinary number 11, would appear in the computer's "binary code" as either the binary number 100 or the binary-coded trinary number 0101.[1] To convert the "binary-coded trinary number" 0101 back to a decimal number, the former bit pair "01" represents $1 \times 3^1 = 3$, and the latter bit pair "01" represents $1 \times 3^0 = 1$, and $3 + 1 = 4$. Of course, the person or device reading the string of 0s and 1s must know the base of numbers that the computer encodes. Otherwise the person or device cannot know, for example, whether 1000 means 8 (if 1000 is a binary number), 6 (if 1000 is a "binary-coded trinary number"), 27 (if 1000 is a trinary number), or something else entirely.

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[1] In general, whole, non-negative numbers of base x (e.g. x = 2 for binary numbers; x = 3 for trinary numbers) can be expressed in the more familiar base 10 (i.e. decimal) system as:

$$\sum_{i=0}^{n} a_i x^i$$

where a is the base 10 system value of the digit or combination of digits being summed, n is the number of digits in the number being converted and where i is the position of the digit in the number, starting with 0 and counting from the right. (To express fractional or negative numbers, the formula is slightly more complicated. Expression of integers ≥ 0, however, is sufficient for purposes of this discussion.) To illustrate using the example above, the binary number 100 can be expressed as $1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 4$. Likewise, the trinary number 11 can be expressed as $1 \times 3^1 + 1 \times 3^0 = 4$. The binary-coded trinary number 0101 must first be broken apart into bit pairs, 01 and 01 in this case, with each bit pair representing a trinary number (here, 01 = 1). The trinary values of the bit pairs are then plugged into the above formula to convert the binary-coded trinary number 0101 into the decimal number 4. For further judicial explanation of the binary system compared with the decimal system of positional notation, see Gottschalk v. Benson, 409 U.S. 63, 66-67 (1972).

In this case, Lear argues that the ’544 patent uses the term “binary code” in a more constrained manner than its broad general application to computer language. According to Lear, the patent uses the term to represent meaning of the message, not its mere form. In other words, the computer symbols and language that the district court called a “binary-coded trinary number,” Preliminary Injunction Order, slip op. at 7, under Lear’s interpretation, is not a binary code at all. Instead, it is a trinary code, because the bit pairs symbolize any of three values, rather than two.

In construing “binary code,” the district court first noted that the claims use the language “binary code” and “binary signal” rather than “binary number” or “base 2 number.” Initial Markman Order at 6. While recognizing that the preferred embodiment describes translating “trinary bits” back into “a binary number” in the receiver, ’544 patent col.8 ll.45-48, the district court perceived that limiting “binary code” to binary numbers on this basis alone would improperly import a limitation into the claims from the specification, Initial Markman Order at 7. The district court then turned to extrinsic sources, namely the IEEE Standard Dictionary of Electrical and Electronic Terms, Sixth Edition, to seek the meaning one of ordinary skill in the art would customarily ascribe to “binary code.” Id. at 7-8. This reasoning led the trial court to its interpretation of the disputed claim terms.

B

The district court commendably strove to follow this court’s rules for claim construction. See Phillips, 415 F.3d at 1318-19. In this regard, the trial court weighed the intrinsic evidence along with the extrinsic evidence and properly sought to avoid importing a limitation from the specification into the claims. See id. Nonetheless, this court discerns that the ’544 patent specification gives particular limiting meanings to the language in the claims. Specifically, the ’544 patent used “binary code” to mean “binary number.” While the district court’s construction may represent an ordinary or customary reading of “binary code,” the ’544 patent restricts “binary code” to a narrower meaning. See id. 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, in the end, the correct construction.”) (quoting Renishaw PLC v. Marposs Societa’ per Azioni, 148 F.3d 1243, 1250 (Fed. Cir. 1998)).

At the outset, this court examines the meaning of “code” as used in the claims. In this context, the ’544 patent’s term “trinary code” is relevant to construing “binary code” because the term “code” presumptively should carry the same meaning throughout the patent. See id. at 1314 (“claim terms are normally used consistently throughout the patent.”). The crux of the dispute over “binary code” centers on the “code” part of that term. The parties agree that “binary” means “base 2,” and “trinary” means “base 3,” or as claim 1 itself states, “three-valued.” ’544 patent col.9 ll.66-67. Thus, “binary code” and “trinary code” should have parallel meanings, differing only insofar as “binary” and “trinary” differ in their relationships to the numbers 2 and 3.

Because the trinary code of the ’544 patent is stored in the transmitter’s microcontroller, and the transmitter’s microcontroller, like other computers, undisputedly stores and processes data as sequences of 0s and 1s, “trinary code” as used in the ’544 patent means values stored and processed in the binary language as 0s and 1s. According to claim 1, the trinary code is generated by the trinary code generator, and is responsive to a variable binary code. Id. col.9 ll.62-67. Contrary to Chamberlain’s assertions,[2] the '544 patent notes that the transmitter's microcontroller generates the trinary code. Thus, the last limitation of claim 1, "transmitting apparatus for modulating the radio frequency oscillatory signal with the trinary code to produce a modulated trinary coded variable radio frequency signal for operation or control of a secure actuator," id. col.10 ll.1-4, cuts against Chamberlain's position. This claim presupposes that the trinary code already exists (in the transmitter's microcontroller) because it expects the transmitter to use that trinary code to modulate the RF signal. The rest of the '544 specification points to the same conclusion. See id. col.5 ll.17-24 ("The microcontroller 78 is connected by a serial bus 79 to a non-volatile memory 80. An output bus 81 connects the microcontroller to a radio frequency oscillator 82. The microcontroller 78 produces coded signals when the button 72 is pushed causing the output of the RF oscillator 82 to be amplitude modulated to supply a radio frequency signal at an antenna 83 connected thereto." (referring to Figure 2, a block diagram of the transmitter) (emphasis added)); see also id. col.3 ll.23-25 ("The transmitter then converts the 32-bit fixed code and the mirrored variable code to a three-valued or trinary

[2] Chamberlain apparently realized that the only way that the district court's construction of "binary code" did not contradict the patent's use of "trinary code," as explained below, is if there is no trinary code inside the transmitter's microcontroller. Chamberlain argued that trinary code forms exclusively outside the transmitter's "computer," at the very end of the signal generation and transmission process. According to Chamberlain, binary code inside the computer, or more accurately, inside the transmitter's microcontroller, generates trinary code through the introduction of timing pulses to modulate a RF oscillating signal. To the contrary, the figures and prose in the specification do not support Chamberlain's "no trinary code in the computer" theory. As explained herein, the specification shows that the "trinary code" in the '544 patent is in fact generated and manipulated inside the transmitter's microcontroller. While the '544 patent supplies a convincing construction of "binary code" and "trinary code," Chamberlain did not identify even any expert reports or testimony in support of its particular claim meaning theory.

bit fixed code and a three-valued or trinary bit variable code or rolling code.") (Summary of the Invention) (emphases added)).

This court also discerns further evidence that the patent places both the generation and manipulation of the trinary code within the transmitter's microcontroller. Specifically, the patent describes the process of generating the trinary-coded RF signal. Both the preferred embodiment and claim 4 put both the fixed trinary code and the rolling trinary code in that generating process:

> The rolling code is then changed to a trinary code having values 0, 1 and 2 and the initial trinary rolling code is set to 0. It may be appreciated that it is trinary code which is actually used to modify the radio frequency oscillator signal and the trinary code is best seen in FIG. 6. It may be noted that the bit timing in FIG. 6 for a 0 is 1.5 milliseconds down time and 0.5 millisecond up time, for a 1, 1 millisecond down and 1 millisecond up and for a 2, 0.5 millisecond down and 1.5 milliseconds up. The up time is actually the active time when carrier is being generated. The down time is inactive when the carrier is cut off. The codes are assembled in two frames, each of 20 trinary bits, with the first frame being identified by a 0.5 millisecond sync bit and the second frame being identified by a 1.5 millisecond sync bit.

Id. col.7 ll.13-30 (emphasis added).

The district court explained that its construction of "binary code" encompassed anything represented in 0s and 1s in a computer. See, e.g., Preliminary Injunction Order at 6-7. Accordingly, the trial court's construction of "binary code" would also encompass values expressed in "trinary code," as the latter term is used throughout the '544 patent. But, as the district court itself recognized, "binary code" cannot include "trinary code." The patent claims and specification, moreover, do not permit these two terms to overlap. See, e.g., '544 patent col.9 l.67 (the trinary code is "responsive to" the binary code) (claim 1); col.7 ll.12-14 (the rolling binary code "is changed to" trinary code by the transmitter); col.3 ll.24-26 (the transmitter "converts" the 32-bit codes (which are binary) to trinary codes). Thus, the district court's construction of "binary code" is internally inconsistent and contradictory to the rest of the patent. To resolve this contradiction and preserve the independent meaning of "binary code" as compared to "trinary code" in the '544 patent, this court reads "binary code" as limited to binary numbers, and "trinary code" as limited to trinary numbers. Because the substance, rather than the form, controls whether a "code" is "binary" or "trinary" for the '544 patent, trinary code is still trinary code when expressed as a trinary number represented by (base 2) bit pairs, using 0s and 1s, as in the transmitter's microcontroller, or when expressed as a trinary number represented in (base 3) timed pulses as in the modulated RF signal transmitted to the receiver. The "binary-coded trinary number[s]" described by the district court, Preliminary Injunction Order at 7, are therefore trinary codes, not binary codes.

C

Because "binary code" or "trinary code" appears in the other three claim terms construed by the district court, the district court's erroneous interpretation of "binary code" also necessarily renders incorrect its construction of these other terms. On this appeal, Lear does not identify any other errors in the district court's claim construction.

III

This court reviews a grant or denial of a preliminary injunction for abuse of discretion. Amazon.com, Inc. v. Barnesandnoble.com, Inc., 239 F.3d 1343, 1350 (Fed. Cir. 2001). Where a district court relies on an erroneous claim construction in granting injunctive relief, this legal error may well constitute an abuse of discretion requiring this court to vacate the injunction. See SRAM Corp. v. AD-II Eng'g, Inc., 465 F.3d 1351, 1352-53 (Fed. Cir. 2006) ("Because the district court erred in construing claim 16, we vacate the district court's . . . grant of an injunction against AD-II, and remand for further proceedings consistent with this opinion."). A preliminary injunction requires analysis of the likelihood of success on the merits. See Abbott Labs. v. Andrx Pharms., Inc., 452 F.3d 1331, 1334 (Fed. Cir. 2006) (quoting Polymer Techs., Inc. v. Bridwell, 103 F.3d 970, 973 (Fed. Cir. 1996)). This factor, in turn, depends fundamentally on the meaning of the asserted claim and its relationship to the accused product or process. Therefore, a correct claim construction is almost always a prerequisite for imposition of a preliminary injunction.

In this case, this court discerns that the errors in claim construction will fundamentally influence the likelihood of success in proving infringement. Thus, the district court's erroneous construction of the disputed terms requires this court to vacate the preliminary injunction. On remand, the district court will also have the opportunity to reassess admissions by either party that were contingent on rejected claim meanings.[3]

REVERSED, VACATED, AND REMANDED

COSTS

Each party shall bear its own costs.

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[3] For example, Lear's contention that its product generated trinary codes (but not binary codes) does not necessarily admit that Lear's product met the "trinary code generator" limitation. See Preliminary Injunction Order at 7. Instead Lear's contention may only illustrate its reliance on a different interpretation of "binary code" and "trinary code generator."