United States Court of Appeals for the Federal Circuit

99-1564

KUSTOM SIGNALS, INC.,

Plaintiff-Appellant,

v.

APPLIED CONCEPTS, INC. and JOHN L. AKER,

Defendants-Appellees.

D. A. N. Chase, Chase & Yakimo, L.C., of Overland Park, Kansas, argued for plaintiff-appellant. Of counsel was Michael Yakimo, Jr.

Ronald Craig Fish, Falk & Fish, LLP, of Morgan Hill, California, argued for defendants-appellees. With him on the brief were Thomas H. Stahl and Gerald A. King, Armstrong Teasdale LLP, of Kansas City, Missouri.

Appealed from: United States District Court for the District of Kansas

Judge Kathryn H. Vratil

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DECIDED: September 5, 2001

Before MAYER, Chief Judge, NEWMAN and LOURIE, Circuit Judges.

Opinion for the court filed by Circuit Judge NEWMAN. Dissenting opinion filed by Chief Judge MAYER.

NEWMAN, Circuit Judge.

Kustom Signals, Inc. appeals the judgment of the United States District Court for the District of Kansas, granting summary judgment of noninfringement of United States Patent No. 5,528,246 issued June 19, 1996, entitled "Traffic Radar with Digital Signal Processing." We affirm the judgment of the district court.[1]

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1 Kustom Signals, Inc. v. Applied Concepts, Inc., 995 F. Supp. 1229, 46 USPQ2d

1056 (D. Kan. 1998) (claim construction, literal infringement) (Kustom I); Kustom Signals, Inc. v. Applied Concepts, Inc., 52 F. Supp. 2d 1260 (D. Kan. 1998) (claim construction, doctrine of equivalents infringement) (Kustom II).

BACKGROUND

Traffic radar equipment emits radio signals that bounce off target surfaces and return to a receiver that determines target speed upon measurement of various characteristics of the signals. If the radar equipment or the target is moving, the returning signals have a different frequency from the outgoing signals because of the Doppler effect, a shift in frequency proportional to the relative speed of the source and the target. Thus, to determine the speed of a target vehicle, traffic radar equipment measures the frequency shift and if necessary corrects for the speed of the radar source.

In addition to measurement of frequency, the amplitude (magnitude or strength) of the returning signal may indicate the size of the target, its distance, the angle of the surface that reflects the radar beam, and the material of which the object is made. In general, a stronger signal is received from larger or closer objects than from smaller objects or objects farther away.

Before the introduction of radar systems incorporating digital signal processing, most traffic radars were designed to respond to the strongest return signal and display the target speed calculated from that signal. This could cause misleading readings when a slower target with a stronger signal (such as a large truck) obscured the response from a faster target with a weaker signal (a speeding car). The introduction of digital signal processing solved this problem by employing a mathematical technique known as Fast Fourier Transform, which allowed analysis of the return signals in greater depth. With digital processing, the returned analog signal may be transformed into a representation based on frequency (indicating target speed) or amplitude (indicating target size).

Digital systems were generally known at the time of the '246 invention; there was

evidence at trial that the defendants had marketed a traffic radar wherein digital signal and Fast Fourier Transform processing were utilized to process and search Doppler radar returns for the strongest signal. Multi-mode analog radars that had the capacity to track either the strongest or fastest target were also known in the art.

The '246 patent, filed on June 30, 1994, is directed to a traffic radar system incorporating digital signal processing having user-selectable modes of operation, whereby the operator selects whether to identify and display the speed of either the strongest target or the fastest target vehicle.[2] In accordance with the '246 specification, the return radar signal is first processed in a series of steps that include selective filtering using a Hamming function window, the digital Fast Fourier Transform, a moving average validation, and several other averaging and signal validation steps to control for false or misleading signals. The validated signals are saved in an indexed array in the memory of the radar system. After another validation check for periodic noise, the array is duplicated in the radar's memory, and one of the duplicate arrays is sorted by decreasing magnitude of the signal while the other is sorted by decreasing frequency.

The internal processing then diverges, depending on whether fastest or strongest search mode was selected by the radar's operator (if fastest search mode was not selected, the radar defaults to strongest search mode). In fastest search mode, the highest frequency (corresponding to the fastest speed) in the array sorted by frequency is read by the system, checked to assure it is within preset limits, converted into speed unit data, and displayed. In

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2 The '246 modes also include selections for moving and stationary radar sources, and same direction or opposite direction targets. These modes of operation are not relevant to this dispute.

strongest search mode, the frequency of the strongest signal is read from the array sorted by magnitude, checked to assure it is within preset limits, converted into speed units, and displayed.

The Applied Concepts radar device here at issue operates similarly, except that both a strongest and a fastest analysis of the return signal are always performed, and are not subject to operator selection. The radar then displays either the speed of the target producing the strongest signal, or speeds of both the fastest and strongest target signals, as determined by the operator selection of the display mode. Kustom states that this operation is within the scope of the '246 claims. Applied Concepts states that its calculation of the speeds of both the strongest and fastest vehicles is excluded by the '246 claims, which explicitly provide for detection and display of either the strongest or fastest vehicle. Applied Concepts also contends that Kustom is estopped, by the prosecution history, from obtaining a claim scope that would embrace the Applied Concepts radar system.

Claim Construction

Claim construction is a matter of law, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71, 34 USPQ2d 1321, 1322 (Fed. Cir. 1995) (*en banc*), aff'd, 517 U.S. 370 (1996), and receives plenary review on appeal. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1172 (Fed. Cir. 1998) (*en banc*).

With emphasis added to the words "or" and "either," on which the claim construction issue turns, independent claims 1, 16, and 20 recite:

> 1. A method of processing Doppler return information in a traffic radar comprising the steps of:
> [a] receiving Doppler return information containing at least one return signal derived from a target vehicle,

[b] presenting said Doppler return information as digital data,
[c] transforming said data into the frequency domain to provide a spectrum that includes frequency components corresponding to Doppler return signals contained in said information,
[d] storing said components in a memory,
[e] searching said components in memory for the component that meets preselected magnitude ***or*** frequency criteria, and
[f] indicating the speed of the target vehicle corresponding to the component that meets said criteria.

16. In a traffic radar, apparatus for processing Doppler return information comprising:
[a] means for receiving Doppler return information containing at least one return signal derived from a target vehicle, and for presenting said information as digital data,
[b] means for transforming said data into the frequency domain to provide a spectrum that includes frequency components corresponding to Doppler return signals contained in said information,
[c] memory means for storing said components,
[d] means for searching the components stored in said memory means to identify the component that meets preselected magnitude ***or*** frequency criteria, and
[e] means responsive to the identified component for indicating the speed of the target vehicle corresponding thereto.

20. In a traffic radar, apparatus for processing Doppler return information comprising:
[a] means for receiving Doppler return information containing at least one return signal derived from a target vehicle, and for presenting said information as digital data,
[b] means for transforming said data into the frequency domain to provide a spectrum that includes frequency components corresponding to Doppler return signals contained in said information,
[c] means for determining the magnitude and frequency of each of said components,
[d] memory means for storing said components,
[e] search means for providing a plurality of modes of operation, including a mode in which a target vehicle component of greatest magnitude in said memory means is identified and a mode in which a target vehicle component of highest frequency in said memory means is identified, and
[f] means under operator control for selecting ***either*** a greatest magnitude ***or*** highest frequency search, whereby ***either*** strongest signal ***or*** fastest signal target identification is provided.

(Emphases and clause letters added.)

The district court construed the term "or" as used in claim clauses 1[e], 16[d], and 20[f] to mean "a choice between either one of two alternatives, but not both." This construction was the basis for the court's summary judgment of no infringement, and is the only aspect of the claim construction on appeal.

Kustom argues that "or" should not have been restricted to a search of either the fastest target data (frequency) or the strongest target data (magnitude) "but not both." Kustom states that the district court's construction contradicts the correct usage of the term "or." Kustom points to the Microsoft Press Computer Dictionary, 24, 344 (3d ed. 1997), which distinguishes among logical operators, defining "or" (which returns a "true" value when one or both values are true), "and" (which returns a "true" value if and only if both values are true), and "exclusive or" (which returns a "true" value when only one value is true). Kustom cites precedent which cautions against construing technical terms of the art at issue in accordance with non-technical dictionary definitions, instead of the technical usage of the field of the invention.

It is presumed that technical words in patent documents are used, and intended to be understood, as they would be used and understood by persons experienced in the field of the invention. See, e.g., Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1478, 45 USPQ2d 1429, 1433 (Fed. Cir. 1998); Hoechst Celanese Corp. v. BP Chemicals, Ltd., 78 F.3d 1575, 1580, 38 USPQ2d 1126, 1130 (Fed. Cir. 1996). However, whatever the meaning of "or" as a logical operator, it is quite clear from the patent documents that Kustom was not using "or" as a technical programming operator, but in its ordinary meaning as stating alternatives. If a divergent specialized usage were intended, the context was such that it was required to be clearly explained in the patent documents. See Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996) ("[A]

patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history.").

The district court construed "or" and "either" in their common usage as designating alternatives. We agree with this construction, for there is no indication that Kustom used these words with a different meaning. Particularly, there is no basis whatsoever for believing that Kustom intended its usage of "or" somehow to embrace "and." The district court analyzed the detailed flowcharts in the '246 specification, which showed that only one search of memory is done for any one data set for either magnitude or frequency criteria. The '246 patent does not describe any embodiment that searches for and displays both modes.

Kustom's claim amendments and accompanying remarks, requiring the alternative "multi-mode" operation that is achieved by operator selection of either strongest or fastest mode, are consistent with this construction. As filed, all of the claims of the '246 patent application were rejected for obviousness over the Muni Quip MDR-1 radar device in combination with United States Patent No. 3,631,486 to Anders. Kustom then rewrote the claims to include the limitation to "magnitude or frequency." Original claim 1 did not include clauses 1[d], 1[e], and 1[f], instead reciting a spectrum validation process and the step of "determining the magnitude and frequency of each valid component." New clause 1[e] limited the memory search to "magnitude or frequency" (emphasis added). Similar changes were made to claim 16, which as filed included "means for determining the magnitude and frequency of each valid component and retaining the same in memory"; this clause was cancelled, and clause 16[d] was added, limiting the memory search to "magnitude or frequency." Original claim 20 as filed included clause 20[f] with its "either" and "or" limitations

on operator selection and target identification. During prosecution Kustom explained to the examiner that "Claim [20] specifically calls for two search modes under operator selection." Kustom described its invention as having "multi-mode operation," whereby the desired mode, whether magnitude (strongest target) or frequency (fastest target) would be selected by the operator. It is apparent that the modes of search and display were intended, in the '246 invention, to be selected in the alternative. The prosecution history requires that "or" means the operator's choice between search for the strongest or fastest target speed, but not both. The district court's claim construction is affirmed.

INFRINGEMENT

Infringement, whether literal or under the doctrine of equivalents, is a question of fact. Bai v. L & L Wings, Inc., 160 F.3d 1350, 1353, 48 USPQ2d 1674, 1676 (Fed. Cir. 1998). However, summary judgment may be appropriate when there is no genuine issue of material fact or when, drawing all factual inferences in favor of the nonmoving party, no "reasonable jury could return a verdict for the nonmoving party." Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986) (the purpose of summary judgment is to avoid an unnecessary trial for which there can be only one outcome). We review the district court's grant of summary judgment de novo. See EMI Group N. Am., Inc. v. Intel Corp., 157 F.3d 887, 891, 48 USPQ2d 1181, 1184 (Fed. Cir. 1998) (reviewing summary judgment of issues of literal infringement and infringement under the doctrine of equivalents, based on the claim construction).

Literal Infringement

On the reasoning that the critical term "or" appears in every claim of the '246 patent, and the undisputed fact that the accused Applied Concepts traffic radar always performs both

a fastest and a strongest search of the stored radar return data without operator intervention, the district court held that the "searching . . . for the component that meets preselected magnitude or frequency criteria" limitation of claim 1, "the means for searching . . . [for] preselected magnitude or frequency criteria" limitation of claim 16, and the "means . . . for selecting either a greatest magnitude or highest frequency search" limitation of claim 20, did not read on the accused device. The district court thus granted summary judgment of no literal infringement.

Kustom argues that the accused device infringes literally in that the second search -- such as a search for amplitude after the operator requests a search for frequency -- is simply an additional function. Kustom points out that the performance of an additional step is irrelevant when the claimed steps are performed. See Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 1271, 229 USPQ 805, 812 (Fed. Cir. 1986) ("comprising" opens a method claim to the inclusion of steps in addition to those stated in the claim).

However, the accused traffic radar device does not merely practice an additional function or perform an additional step; it performs a function explicitly moved outside the scope of the claims, for the alternative "or" excludes devices that search both magnitude and frequency. Although Kustom is correct that "comprising" means that the claims do not necessarily recite all of the elements and limitations of a device, or steps of a method, the clause imposing the limiting term "or" requires the exclusion of devices whose memory search includes magnitude and frequency. The open-ended transition "comprising" does not free the claim from its own limitations. See Spectrum Int'l, Inc. v. Sterilite Corp., 164 F.3d 1372, 1379-80, 49 USPQ2d 1065, 1070 (Fed. Cir. 1998) (the term "comprising" cannot restore subject matter otherwise excluded from the claim). The district court correctly held that the accused

device, by its search of both magnitude and frequency without operator instruction, is outside the literal scope of the claims.

The Doctrine of Equivalents

The district court ruled that there was not infringement under the doctrine of equivalents on the ground that finding the accused device equivalent to the claimed invention would eliminate the "or" element of the claims, thereby violating the all-elements rule. However, this is not an appropriate application of the all-elements rule.

The all-elements rule is that an accused device must contain every claimed element of the invention or the equivalent of every claimed element. See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 29, 41 USPQ2d 1865, 1871 (1997). No claimed element, or an equivalent thereof, can be absent if the doctrine of equivalents is invoked. However, all of the steps or elements of method claim 1 or apparatus claims 16 and 20 are undisputedly present in the accused device. The word "or" is not itself an "element" of an apparatus or a step of a method, and its presence to signify alternative elements does not convert "or" into an element. The ruling of non-infringement can not be sustained on this ground.

However, the district court also considered equivalency on alternative grounds. Applying the function/way/result test of Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605, 608, 85 USPQ 328, 330 (1950), the court held that no reasonable trier of fact could find equivalency. The court found that the accused device's methodology of automatically searching both magnitude and frequency data was a substantially different way of operation, compared with the '246 device's operator-initiated search of either magnitude or frequency data. Kustom argues that this analysis is incorrect, and that a "link" in the radar's

programming is all that differentiates the "or" of the claims and the "and" of the accused device. Kustom states that such a link is an insubstantial difference.

The district court correctly concluded that the prosecution history estops Kustom from relying on the position that a device which searches for both fastest and strongest targets performs substantially the same function as a device which searches for either the fastest or the strongest target. During prosecution, in response to a rejection for obviousness under 35 U.S.C. §103, Kustom amended claims 1 and 16 to include this limitation to the alternative search for magnitude or frequency, and argued that claim 20 was directed to operator-selected alternative search modes for magnitude or frequency. The use of digital signal processing for traffic radar was known to the prior art, and the prosecution of the '246 invention emphasized its operator-selected search of memory for the data identifying the fastest or strongest target. The amendments and arguments during prosecution estop Kustom's assertion of equivalency of the accused radar device, which performs and displays both search modes. We affirm the grant of summary judgment of noninfringement on this alternative ground.

AFFIRMED

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MAYER, Chief Judge, dissenting.

I respectfully dissent. In this case, "or" should be construed inclusively to mean "one or another or both." First, the plain meaning of "or" can be "either or both." If a store owner says, "If it hails or snows today, we will close the store," then the owner will still close the store if it happens to hail and snow. Moreover, because we are required to refer to the detailed flowcharts in the '246 patent specification to interpret "or" in two of the claims in suit under 35 U.S.C. § 112 ¶ 6, it is appropriate for us to adopt the technical Boolean definition of the term to determine its meaning to one of ordinary skill in the art. The structure and acts detailed in the specification flowcharts are consistent with this construction. Regardless of whether the operator selects the fastest or strongest mode, both the strongest and the fastest signals are always "searched" (as the district court construed the term). The signals are saved in the indexed array, and duplicated, with one set sorted by decreasing magnitude (finding the

"strongest" signal) and the other sorted by decreasing frequency (finding the "fastest" signal). The prosecution history does not limit this construction. Kustom's addition of the "or" limitation did not distinguish the invention over the Muni Quip MDR-1 radar device because that device also had the capacity to track the strongest or fastest signal. For these reasons, I would further interpret "criteria" as "standards used to search for a fastest or strongest target." I would remand for a determination of disputed issues of material fact as to the operation of the accused device under the above claim construction. A device may be an improvement over prior art, and at the same time infringe.