

United States Court of Appeals for the Federal Circuit

00-1053, -1059

UNION PACIFIC RESOURCES COMPANY,

Plaintiff-Appellant,

v.

CHESAPEAKE ENERGY CORPORATION AND CHESAPEAKE OPERATING,
INC.,

Defendants-Cross Appellants,

and

CHESAPEAKE EXPLORATION LIMITED PARTNERSHIP,

Defendant.

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Ronald G. Bliss, Fulbright & Jaworski L.L.P., of Houston, Texas, argued for plaintiff-appellant. With him on the brief was William J. Boyce.

William L. LaFuze, Vinson & Elkins L.L.P., of Houston, Texas, argued for defendants-cross appellants. With him on the brief were Steven R. Borgman, and Gwendolyn J. Samora.

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

Judge Terry Means

United States Court of Appeals for the Federal Circuit

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CHESAPEAKE ENERGY CORPORATION AND CHESAPEAKE OPERATING, INC.,

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DECIDED: January 5, 2001

Before MICHEL, LOURIE, and RADER, Circuit Judges.

RADER, Circuit Judge.

Following a bench trial, the United States District Court for the Northern District of Texas held U.S. Patent No. 5,311,951 (the '951 patent) invalid for nonenablement and indefiniteness. Union Pac. Res. Co. v. Chesapeake, No. 4:96-CV-726-Y (N.D. Tex. Sept. 21, 1999) (UPRC). The trial court also determined that Chesapeake Energy Corporation, Chesapeake Operating, Inc., and Chesapeake Exploration Limited Partnership (collectively Chesapeake) did not infringe the '951 patent. Union Pacific Resources Company (UPRC), the owner of the '951 patent, challenges these holdings and contends that the district court erred by admitting certain opinion testimony under Fed. R. Evid. 701. On cross-appeal, Chesapeake challenges the district court's decision that UPRC did not commit inequitable conduct. Further, Chesapeake contends that the trial court should have found this case to be exceptional and awarded it attorney fees under 35 U.S.C. § 285 (1994).

Because the record substantiates the trial court's enablement and indefiniteness decisions, and because the district court did not abuse its discretion by deciding to admit testimony, or by denying UPRC's motions for a finding of inequitable conduct or an award of attorney fees, this court affirms.

I.

The '951 patent claims a particular method of horizontal drilling for the exploration of oil and natural gas. In horizontal drilling, as compared to vertical drilling, a well drilling bit may be steered in any direction, resulting in a serpentine borehole (called a horizontal borehole), rather than a straight-down, vertical borehole. With a horizontal borehole, a drill bit can penetrate a thin underground layer of oil or gas and move parallel to the surrounding strata or geologic formations. The path of the borehole therefore remains continuously within that thin layer. When properly directed, a horizontal borehole can provide a flow rate of oil or gas many times greater than that provided by a vertical borehole. Thus, horizontal drilling has allowed effective exploitation of many previously untapped oil and gas reserves.

Knowing the location of a bit relative to the surrounding strata facilitates accurate steering of the bit towards and through a predetermined target zone in the strata. Conventional techniques supply a three-dimensional location of the bit in the borehole relative to a point on the surface. Knowing the bit's location relative to the surface, however, does not inform one of ordinary skill in the art as to the bit's location relative to the surrounding strata underneath the surface, which dips and vacillates in the earth.

The '951 patent discloses a method for locating a drill bit in a horizontal borehole relative to the surrounding strata. The method compares "characterizing information," such as the three-dimensional location of a bit relative to the surface, as well as gamma ray radiation log information obtained from that location, from two different boreholes. Specifically, information from a vertical "offset" borehole is compared to information from a horizontal borehole to determine the orientation of the horizontal borehole relative to the surrounding strata.

The two independent claims of the '951 patent read as follows:

1. A method of determining the location of a borehole relative to strata in the earth, comprising the steps of:

- (a) providing information from said borehole, which information characterizes the strata;
- (b) providing characterizing information of said strata from an offset location; and
- (c) comparing said characterizing information from said borehole to said characterizing information from said offset location to determine the location of selected points along said borehole relative to said strata.

6. A method of determining the location of a borehole in the earth, comprising the steps of:

- (a) providing characterizing information of the earth from an offset vertical location;
- (b) providing characterizing information of the earth from along

the length of said borehole;

(c) rescaling said borehole characterizing information onto a vertical scale; and

(d) comparing said rescaled borehole characterizing information to said offset characterizing information to determine the location of said borehole within said earth.

'951 patent, col. 9, ll. 1-13; col. 10, ll. 8-19.

After construing the claims of the '951 patent and conducting a bench trial, the district court found that all seven claims of the '951 patent were invalid as non-enabled under ¶ 1 and indefinite under ¶ 2 of 35 U.S.C. § 112 (1994). The district court also found that Chesapeake did not infringe any of the claims. UPRC appeals these findings. The district court also refused to find that UPRC engaged in inequitable conduct or that this case was "exceptional" under 35 U.S.C. § 285. Chesapeake cross-appeals with regard to the issues of inequitable conduct and attorney fees. This court has jurisdiction under 28 U.S.C. § 1295(a)(1) (1994).

II.

Claim Construction

Chesapeake, as cross-appellant, contends that the district court erred in its construction of the claims of the '951 patent. Claim construction is a matter of law which this court reviews without deference. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (*en banc*). In its Markman ruling, the district court correctly interpreted "strata in the earth" and "said strata" to mean identifiable and distinguishable layers of material (*e.g.*, rock) beneath the surface of the earth. Union Pac. Res. Co. v. Chesapeake, 4:96-CV-726-Y, slip op. at 7 (N.D. Tex. Nov. 30, 1998, Order Granting In Part Defendants' Motion for Claim Interpretation Based on Intrinsic Evidence) (Markman Motion). The court also correctly interpreted "information characterizes said strata," "characterizing information of said strata," and "characterizing information" to mean data produced by logging methods conventional in the industry. These conventional methods permit identification of distinguishing characteristics between layers of rock beneath the surface of the earth. Markman Motion at 7-8. In particular, these phrases can refer to information such as: (1) an X offset (east/west coordinate); (2) a Y offset (north/south coordinate); (3) a true vertical depth (TVD) or Z offset; and (4) a value from a gamma ray log. '951 patent, col. 2, ll. 5-8; col. 5, ll. 47-56.

The district court interpreted the phrase "comparing said . . . characterizing information" in claims 1 and 6 to mean "examining data . . . from selected points along a [horizontal] borehole . . . against data . . . from selected points along an offset vertical well, in such a manner that the proximity to, or location within, certain strata . . . may be ascertained. That manner involves using four (4) coordinates for each selected point along the borehole, the fourth being that of 'true stratigraphic depth.'" Markman Motion at 9.

The '951 patent uses the term "comparing" in only a few sentences in the specification:

"the method compares the borehole characterizing information to the offset characterizing information to determine the location of selected points along the borehole relative to the strata" (col. 1, l. 68 to col. 2, l. 3; emphasis added); "This rescaled log can then be compared to the offset log. The character of the two logs are compared to determine the location of the borehole relative to stratigraphy." (col. 2, ll. 27-30; emphasis added); "Comparing FIG. 5A to FIG. 2, it is seen that the logs appear similar. Comparing FIG. 5B to the lower portion of FIG. 2, the logs also appear similar." (col. 7, ll. 7-10; emphasis added). The precise meaning of the term "comparing" in the claims, however, is not explained.

The specification, however, also uses the term "correlating," which appears to involve both "rescaling" and "comparing." The specification discusses "correlation points" as "selected points along the length of the borehole being drilled." '951 patent, col. 5, ll. 45-46. The specification also describes the correlation of selected points on the horizontal borehole log to selected points on an offset log. '951 patent, col. 6, ll. 13-40; col. 7, ll. 44-51. UPRC's witnesses testified that "true stratigraphic depth" (TSD) is determined through correlation of the two logs. Those same witnesses explained that getting that information through correlation is the novel feature of this invention.

While the term "true stratigraphic depth" is not recited anywhere in the method claims, the specification uses this term to describe the location of a borehole relative to the target zone:

The location of the borehole relative to the surrounding stratigraphy, and thus the target zone, is determined. This is accomplished by determining a true stratigraphic depth (TSD) for each correlation point. The true stratigraphic depth determines the location of the target zone relative to the location of the correlation point and thus of the borehole.

'951 patent, col. 5, ll. 61-67. According to the inventors, the prior art does not define "true stratigraphic depth," rather the term has meaning solely in the context of the '951 patent.

With regard to "rescaling," the district court correctly defined "rescaling said borehole characterizing information into a vertical scale" in claim 6 to mean the conversion of borehole "information" into a format showing vertical depth of the horizontal borehole. Markman Motion at 15. Once the horizontal borehole information is rescaled, i.e., converted into a vertical scale, that information can be "compared" to the information from the offset location.

Enablement

To satisfy section 112 of the 1952 Patent Act, the specification must enable a person of ordinary skill in the art to make and use the invention. 35 U.S.C. § 112, ¶ 1. Enablement is a question of law reviewed by this court independently and without deference. Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 1268, 229 USPQ 805, 811 (Fed. Cir. 1986). As is often true of legal questions, however, the ultimate legal conclusion of enablement rests on factual underpinnings. When the district court's

judgment on enablement rests on these factual underpinnings, this court reviews the decision for clearly erroneous findings of fact and errors of law. Gould v. Quigg, 822 F.2d 1074, 1077, 3 USPQ2d 1302, 1303-04 (Fed. Cir. 1987).

The district court stated that "the record contains clear and convincing evidence that those of ordinary skill in the art cannot determine from a careful reading of the patent, even in light of the specification and the drawings, how to practice the claimed method." UPRC, slip op. at 14. More specifically, the court found:

[T]he patent as a whole fails to explain to one of ordinary skill in the art how to select points for correlation, how to select sections to consider, how to "stretch and squeeze" or manipulate the horizontal log in an attempt to match it to the vertical, how to determine when an adequate match has been achieved, and how to use that information to develop a display that will aid in directing extensions.

Id. at 12-13.

UPRC acknowledged in its brief to this court: "What is not known is the TVD (hence TSD) In order to solve for correct TSD measured, the known TVD log is rescaled vertically by computer without altering the amplitude of the characterizing information." Brief for Appellant at 18-19, Union Pac. Res. Co. v. Chesapeake (Fed. Cir. 2000) (Nos. 00-1053, 00-1059). According to the district court, the "inventors of the '951 Patent purposely excluded computer programming details [such as TSDDET and GRNAV] that UPRC was using to perform the claimed method on April 15, 1993, from their description of the best mode of performing the patented invention." UPRC, slip op. at 19.

Moreover, an inventor admitted that UPRC kept as a trade secret the computer programs designed to perform the rescaling step. The record shows that D. N. Meeham sent an electronic mail message in May 1994 to another inventor, D. G. Kyte, which stated: "None of the GR/NAV type stuff is included [in the patent]; this type of expertise (and especially the software, manuals, examples, etc.) are 'trade secrets'" Because UPRC's computer software programs were secret, the exact method used by the inventors to rescale the information was not disclosed or explained in the patent. UPRC, slip op. at 19. The district court found, however, that the computer programs were not considered by the inventors to be the best mode of practicing the invention. Id.

As stated in the inventors' expert report, "rescaling is the method whereby a TSD is determined which can be compared with the vertical offset information." The inventors and other witnesses for UPRC also asserted that rescaling is a process of "stretching" and "squeezing" the borehole gamma ray log to determine a TSD log. Moreover, an expert for UPRC pointed out that a TSD log is developed by correlation, which is "probably the most unique part of the patent."

The district court found, however, that the specification does not show how "correlating" (i.e., "rescaling" and/or "comparing") is achieved. The district court did not clearly err in this finding. According to UPRC's expert witness, one ordinary of skill in the art cannot achieve correlation by visually comparing two graphs and and subjectively matching

points with similar peaks:

Q. You don't think a geologist could look at those two logs right there and correlate the Peak E's and Peak F's [as shown in Figures 6 and 7 in the '951 patent] and so forth?

A. If I erased all of those markers, I would not guess that E was repeated three times on that log. No, sir, I would not.

In other words, the record suggests that without significant mathematical manipulation of the information, one of skill in the art could not "compare" the information in Figures 6 and 7 of the '951 patent to create Figure 8 (or, likewise, the information in Figures 2 and 3 to create Figure 4) without the hindsight of the lettering or numbering on the different peaks. For example, one of ordinary skill in the art would not likely deduce that peak "E" occurs three times in Figure 7 without the letter "E" present on the graph.

As aptly pointed out by the district court:

The patent explains that the determination of a TSD for each point along the borehole solves the problem of determining the actual location within strata of the horizontal borehole, yet it does not tell one how to identify that new and undefined location. In an apparent attempt to disclose the functionality of the software the inventors used to implement their method, the correlation points are given coordinates and a description of how to interpolate other points is set forth, yet how that formula relates to the determination of TSD is not explained.

UPRC, slip op. at 13-14 (emphasis added).

In other words, the patent does not explain that stretching and squeezing of the borehole log, as well as significant trial and error, are necessary to correlate (*i.e.*, "compare" and "rescale") the logs. Nor does the patent describe how to select sections of the borehole log to stretch or squeeze, or how to select points to correlate. Neither the brief discussions of Figures 5 and 9 (col. 7, ll. 3-14; col. 8, ll. 25-37), nor the discussion of TSD point determinations (*e.g.*, col. 6, l. 55 to col. 7, l. 2), explain this pivotal correlation process.

As noted by the district court, the record—including the patent itself, expert testimony and other trial evidence, and the prior art—show that one of skill in the art would not understand how to correlate, by "rescaling" and "comparing," the "characterizing information" to determine the location of the horizontal borehole relative to strata or in the earth. Based on this evidence of record, the district court's factual conclusions regarding lack of enablement of the '951 patent are not clearly erroneous.

UPRC asks this court to review the district court's invalidity findings de novo because, UPRC asserts, the district court did not properly apply the clear and convincing burden of proof. UPRC draws attention to the district court's discussion of the principle in Applied Materials v. Advanced Semiconductor Materials, Inc., 98 F.3d 1563, 1569, 40 USPQ2d 1481, 1485 (Fed. Cir. 1996) ("The presentation at trial of additional evidence that was not before the PTO does not change the presumption of validity or the

standard of proof, although the burden may be more or less easily carried because of the additional evidence."). UPRC, slip op. at 3. However, the district court did apply the clear and convincing burden of proof. The district court's opinion does not show that it applied a "downgraded" burden, as suggested by UPRC.

Definiteness

Whether a claim is invalid under 35 U.S.C. § 112, ¶ 2, for indefiniteness is a question of law reviewed de novo. Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 702, 48 USPQ2d 1880, 1886 (Fed. Cir. 1998). The definiteness inquiry focuses on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the rest of the specification. Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). Even if the written description does not enable the claims, the claim language itself may still be definite. In re Hyatt, 708 F.2d 712, 714-15, 218 USPQ 195, 197 (Fed. Cir. 1983); In re Miller, 441 F.2d 689, 693, 169 USPQ 597, 600 (CCPA 1971) ("[B]readth is not to be equated with indefiniteness . . .").

According to the claims, the method for determining the location of a borehole relative to strata (or in the earth) comprises a step of "comparing" characterizing information. The precise meaning of the term "comparing" is not explained in the written description. The patent suggests, however, that "comparing" (which incorporates "rescaling" in claim 1) involves the determination of TSD by correlation. As explained during trial, correlation is a process of stretching and squeezing a TVD log by carefully choosing assumed bed dip angles, until a portion of the TVD log matches a portion of the offset log. In other words, the "comparing" step presumably refers to a complex "correlation" step suggested (but not explained) in the written description.

Yet "comparing" could undoubtedly have other meanings to a person of skill in the art. For example, because the patent does not indicate that it is a technical or scientific term, the term "comparing" could simply mean "to examine in order to note the similarities or differences of." The American Heritage College Dictionary 283 (3d ed. 1997). Nothing in the specification describes "comparing" (or "rescaling") as a process of stretching and squeezing a TVD log by carefully choosing bed dip angles. Thus, the '951 patent does not define the means to "compare" the two sets of characterizing information. The district court correctly found that the "comparing" steps in claims 1 and 6 are indefinite.

Evidentiary Rulings

During trial, the district court heard evidence from nine witnesses regarding whether the written description of the '951 patent enabled the claims. UPRC objected to testimony of eight of the witnesses because they were not designated or treated as experts. Because those eight witnesses offered opinions regarding enablement, UPRC alleges that their testimony was only admissible under Fed. R. Evid. 702 (rather than Fed. R. Evid. 701). Thus, UPRC concludes that the testimony of each of the eight witnesses was improperly admitted because the witnesses had not been designated as experts as required by Fed. R. Civ. P. 26(a)(2). According to UPRC, the witnesses were not

properly admitted under Fed. R. Evid. 702 because Fed. R. Civ. P. 26(a) requires a party to disclose to the other parties the identity of any witnesses who may be used at trial under Fed. R. Evid. 702. UPRC also asserts that without such disclosure, Fed. R. Civ. P. 36(c)(1) mandates the exclusion of the expert testimony, absent "substantial justification," which was not found by the district court here. Chesapeake, on the other hand, argues that because the testimony was factual and based upon the witnesses' personal knowledge, the testimony was properly admitted under Fed. R. Evid. 701.

The Federal Circuit applies its own law with respect to issues of substantive patent law and certain procedural issues unique to patent law, but applies the law of the circuit in which the district court sits as to non-patent issues. Institut Pasteur v. Cambridge Biotech Corp., 186 F.3d 1356, 1368 (Fed. Cir. 1999). The Fifth Circuit reviews evidentiary rulings, which are not unique to patent law, under an abuse of discretion standard. Snap-Drape, Inc. v. Comm'r of IRS, 98 F.3d 194, 197 (5th Cir. 1996). In the Fifth Circuit, "[u]nder Fed. R. Evid. 701, a lay opinion must be based on personal perception, must 'be one that a normal person would form from those perceptions,' and must be helpful to the jury We have allowed lay witnesses to express opinions that required specialized knowledge." United States v. Riddle, 103 F.3d 423, 428 (5th Cir. 1997) (quoting Lubbock Feed Lots, Inc. v. Iowa Beef Processors, 630 F.2d 250, 263 (5th Cir. 1980)).

In the present case, the record shows that these eight witnesses have extensive personal experience in the oil drilling industry. Indeed, many of the witnesses were employees of major oil drilling companies who had contributed extensively to the prior art in this field. Because the eight witnesses may have testified based on their own personal experiences under Fed. R. Evid. 701, any alleged prejudicial error by the district court regarding the admission of these witnesses' testimony in this case does not rise to the level of abuse of discretion.

Infringement

The district court held that Chesapeake did not infringe any of the claims of the '951 patent based on its finding that the '951 patent was invalid. UPRC at 15. Having affirmed the trial court's finding of invalidity with respect to all claims at issue, this court need not reach the issue of infringement.

Inequitable Conduct

It is inequitable conduct to withhold material information from a patent examiner or to submit false material information with the intent to deceive or mislead the examiner into granting a patent. Molins PLC v. Textron, Inc., 48 F.3d 1172, 1178, 33 USPQ2d 1823, 1826 (Fed. Cir. 1995); Kingsdown Med. Consultants, Ltd. v. Hollister Inc., 863 F.2d 867, 872, 9 USPQ2d 1384, 1389 (Fed. Cir. 1988) (en banc). The two essential elements of inequitable conduct—materiality and intent to deceive—must both be proven by clear and convincing evidence. Kingsdown, 863 F.2d at 872. This court reviews these underlying factual findings for clear error, and will not reverse without a "definite and firm conviction that a mistake has been committed." Elk Corp. v. GAF Bldg. Materials Corp., 168 F.3d 28, 31, 49 USPQ2d 1853, 1855 (Fed. Cir. 1999) (quoting Molins, 48

F.3d at 1178).

Once the record supports the threshold levels of materiality and intent, the ultimate determination of inequitable conduct is within the discretion of the district court. Kingsdown, 863 F.2d at 876. In making this determination, the court must conduct a balancing test between the levels of materiality and intent, with a greater showing of one factor allowing a lesser showing of the other. Halliburton Co. v. Schlumberger Tech. Corp., 925 F.2d 1435, 1440, 17 USPQ2d 1834, 1839 (Fed. Cir. 1991); Akzo N.V. v. United States Int'l Trade Comm'n, 808 F.2d 1471, 1481-82, 1 USPQ2d 1241, 1247 (Fed. Cir. 1986). This court reviews an ultimate determination of inequitable conduct for abuse of discretion. Kingsdown, 863 F.2d at 876.

On appeal to this court, Chesapeake argues that the claims of the '951 patent are unenforceable because the inventors were aware of, but did not disclose, several allegedly highly relevant prior art articles during prosecution. Specifically, Chesapeake contends that the high level of materiality of the undisclosed references, along with the inventors' knowledge of those references, demonstrates intent to deceive.

"Intent to deceive can not be inferred solely from the fact that information was not disclosed; there must be a factual basis for a finding of deceptive intent." Hebert v. Lisle Corp., 99 F.3d 1109, 1116, 40 USPQ2d 1611, 1615 (Fed. Cir. 1996). Given the district court's ruling against Chesapeake's proposed findings relating to inequitable conduct "for the reasons stated in Plaintiff's response brief," and that Chesapeake does not point to any convincing evidence of intent by the inventors, the district court did not clearly err in finding no deceptive intent, and did not abuse its discretion by finding no inequitable conduct.

Attorney Fees

By motion, Chesapeake asked the district court to grant them reasonable attorney fees under 35 U.S.C. § 285 based on alleged inequitable conduct and litigation misconduct by UPRC. The district court denied the motion.

In considering an award of attorney fees, "[t]he district court must first determine whether the case is exceptional, a factual determination that we review for clear error; if the case is found to be exceptional, the court must then determine whether attorney fees should be awarded, a determination that we review for abuse of discretion." Enzo Biochem, Inc. v. Calgene, Inc., 188 F.3d 1362, 1370, 52 USPQ2d 1129, 1134-35 (Fed. Cir. 1999).

On appeal, Chesapeake makes no convincing showing that the district court committed clear error by refusing to find this case to be exceptional. As discussed above, the district court did not abuse its discretion by refusing to find inequitable conduct. In addition, Chesapeake contends that UPRC did not withdraw a "frivolous" claim for contributory infringement early enough. Chesapeake also cites to examples of claims and defendants that were dropped by UPRC during the course of the suit. Claims and defendants frequently are dropped and amended during the course of a lawsuit. Moreover, sound judicial policy encourages a narrowing of issues. Thus, Chesapeake

does not show that these actions were exceptional or vexatious as compared to normal litigation. In addition, Chesapeake refers to the large amount of money damages at stake in this litigation. The potential dollar value of damages in a case, however, is beside the point. The district court did not clearly err in failing to find the case exceptional, and therefore did not abuse its discretion by refusing to award attorney fees under § 285.

III.

For the reasons stated above, this court affirms the district court's decision that the '951 patent is invalid for lack of enablement and indefiniteness. This court also finds that the district court did not abuse its discretion by admitting the opinion testimony under Fed. R. Evid. 701. Nor did the district court abuse its discretion by refusing to find inequitable conduct or award attorney fees. Thus, with the exception of the issue of infringement, which this court does not reach, this court affirms the decision of the district court.

COSTS

Each party shall bear its own costs.

AFFIRM

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