

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAULO TUBEL, BRIAN BIDIGARE, MICHAEL JOHNSON,
JOHN HARRELL, and BENN VOLL

Appeal 2007-3931
Application 10/447,855
Technology Center 2800

Decided: February 12, 2008

Before LANCE LEONARD BARRY, MAHSHID D. SAADAT,
and St. JOHN COURTENAY III, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 17-20, 42-47, 49-72, and 75-91, which are all of the claims pending in this application as claims 1-16, 21-41, 48, 73, and 74 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

Appellants have invented a fiber optics-based method and a system for monitoring downhole parameters as well as the condition and operation of downhole tools (Spec. 5). An understanding of the invention can be

derived from a reading of independent claim 17, which is reproduced as follows:

17. A downhole tool monitoring system, comprising:

(a) a tool in a first production wellbore;

(b) at least one fiber optic sensor in the first wellbore which makes measurements indicative of an operating parameter of the tool; and

(c) a downhole data acquisition unit which analyzes said measurements made by said at least one fiber optic sensor.

The Examiner relies on the following prior art references in rejecting the claims on appeal:

Lasseter	US 4,742,459	May 3, 1988
Kluth	WO 96/09461	Mar. 28, 1996

Karaman, *A Field Trial to Test Fiber Optic Sensors for Downhole Temperature and Pressure Measurements*, West Coalinga Field, California, Society of Petroleum Engineers (SPE), 351-357 (1994).

Claims 17-20, 42-47, 49, 50, 52-56, 58-72, 75, 76, 78-81, and 83-91¹ stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Karaman and Lasseter. (Ans. 3-4 & 5-6).

Claims 51, 57, 77, and 82 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of Karaman, Lasseter, and Kluth. (Ans. 4-5).

We affirm.

¹ We observe that claims 87 and 89 are dependent upon cancelled claims 73 and 74.

ISSUE

The issue is whether Appellants have shown that the Examiner erred in rejecting the claims under 35 U.S.C. § 103. Appellants argue that Lasseter neither teaches the claimed limitations such as a production wellbore and processing of measurements, nor provides any suggestion that would have made its combination with Karaman obvious to one of ordinary skill in the art (Br. 7-13). Therefore, the issue turns on whether there is a legally sufficient justification for combining the disclosures of Lasseter and Karaman and if so, whether the combination of the applied references teaches the claimed subject matter.

FINDINGS OF FACT

The following findings of fact (FF) are relevant to the issue involved in the appeal and are supported by substantial evidence.

1. Lasseter relates to a method and apparatus for determining hydraulic properties of formations surrounding a borehole for improved accuracy and depth of investigation over a relatively wide range of formation permeabilities quickly and without undue processing (col. 3, ll. 4-17).

2. With respect to Figure 1, Lasseter discloses that the borehole 32 is typically filled with a fluid wherein the investigating devices are suspended (col. 5, ll. 44-53).

3. Lasseter further discloses placing circuitry 51 at the surface while portions of it may be positioned downhole and used as the control, communication and preprocessing circuitry (col. 5, ll. 58-63).

4. Lasseter provides for the measured output signals that are available to processor 500, which may be placed in a remote location and may receive the inputs through transmission of previously recorded signals (col. 6, ll. 50-65).

5. Karaman discloses fiber optic sensors that are used for taking temperature and pressure measurements in wellbores (p. 351, Abstract).

6. Karaman provides for fiber optic cables to be used with the sensing parts which are designed for telecommunication in harsh environments (p. 352, right col., 1st paragraph).

7. Karaman suggests using the disclosed fiber optic sensor systems in permanent downhole applications such as exploration, reservoir characterization, and production monitoring (p. 354, left col., 4th paragraph).

PRINCIPLES OF LAW

To reach a conclusion of obviousness under § 103, the Examiner bears the burden of producing factual basis supported by teaching in a prior art reference or shown to be common knowledge of unquestionable demonstration. Our reviewing court requires this evidence in order to establish a *prima facie* case. *In re Piasecki*, 745 F.2d 1468, 1471-72 (Fed. Cir. 1984).

Furthermore, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. See *In re Kahn*, 441 F.3d 977, 987-88 (Fed. Cir. 2006), *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991) and *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007).

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR*, 127 S. Ct. at 1739). “One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.” *KSR*, 127 S. Ct. at 1742.

The *KSR* Court further recognized that “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” *KSR*, 127 S. Ct. at 1742. In such circumstances, “the fact that a combination was obvious to try might show that it was obvious under §103.” *Id.*

ANALYSIS

Rejection of claims over Karaman and Lasseter

Appellants' first argument is that Lasseter's method and apparatus determine hydraulic properties of formations surrounding a borehole (Br. 7) and do not deal with the claimed production borehole (Br. 8; Reply Br. 2). The Examiner responds by relying on Figure 1 of Lasseter and states that

while the downhole tool is not specifically described for use in a production wellbore, it is clearly intended for existing, pre-drilled wellbores (Ans. 6-7).

Upon a review of Lasseter, we remain unconvinced by Appellants' arguments that the borehole in Lasseter is different from a production wellbore, as recited in claim 17. Lasseter clearly takes measurements of the hydraulic properties of subsurface formations that are traversed by boreholes using the measuring tools placed inside the boreholes (FF 1-3). Appellants' claim 17 recites "a first production wellbore" without delimiting the claimed steps to a specific process that is unique to a production borehole. In that regard, the recited monitoring system lacks any distinguishing features that would differentiate between its application in a production wellbore and in a non-production wellbore. Therefore, to the extent that claim 17 requires a production wellbore, we find that the Examiner has properly determined that one of ordinary skill in the art would have applied the monitoring system of Lasseter to other types of wellbores such as a production wellbore, as recited in claim 17. Additionally, Karaman suggests using fiber optics sensors in downhole applications related to surrounding measurements as well as production monitoring (FF 7).

Appellants further argue that the combination of Karaman and Lasseter fails to teach all of the claimed features (Br. 8). Appellants argue that the preprocessing circuitry in Lasseter is different from the circuitry for "processing," as recited in independent claim 64 (Br. 9). Appellants point out that the processing in Lasseter is done at the surface by processor 500 which is not in a downhole (*id.*). The Examiner responds by stating that while Karaman teaches fiber optic sensors for downhole applications, Lasseter clearly provides for processing in the wellbore as well as at the

surface by placing preprocessing circuitry 51 in the wellbore (Ans. 8). The Examiner further argues that the term “processing” in claim 64 is not sufficiently precise to be different from Lasseter’s preprocessing performed by circuitry 51 shown in Figure 1 (Ans. 9).

We agree with the Examiner that the use of fiber optic sensors of Karaman is applicable in taking measurements in boreholes such as those disclosed by Lasseter (FF 5-6). Additionally, even if “preprocessing” is some kind of “preliminary processing,” as asserted by Appellants (Br. 9), the claimed features of “analyze” recited in claim 17 and “processing” recited in claim 64 do not preclude encompassing other parts of analysis and processing such as the preliminary processing. Therefore, although some processing is performed in processor 500 (FF 4), the claimed features of “analyze” and “processing” do read on the preprocessing performed in circuitry 51 of Lasseter since preprocessing involves some type of data manipulation and therefore, is a part of processing.

Appellants further contend that Lasseter teaches away from the proposed combination with Karaman since it uses wireline-conveyed devices wherein the hole needs to be sealed off for measurements (Br. 11). With respect to combinability of references, Appellants assert that since Lasseter lacks processing circuitry that can be placed downhole or at the surface, the Examiner’s reliance on “ordinary skill in the art” and “known type” is improper (Br. 13). The Examiner asserts that Lasseter is intended for teaching measurements performed in wellbores and is applicable in the same environment disclosed in Karaman (Ans. 9-10). The Examiner further concludes that applying known types of measurement and processing

circuitry, such as those disclosed in Lasseter, would have been obvious to one of ordinary skill in the art (Ans. 11).

Based on our analysis of Karaman and Lasseter above, we agree with the Examiner's position that nothing in the references teaches away from using various circuitry disclosed by Lasseter in combination with the fiber optic sensor system of Karaman. In particular, we find that Lasseter provides for more accurate and faster determination of the borehole properties (FF1), which would have suggested placing the data acquisition and processing systems within the borehole. Therefore, contrary to Appellants' arguments (Br. 11-13; Reply Br. 3) that the arrangement in Lasseter teaches away from the limitations of claims 17 and 64, Lasseter recognizes the need for reliable and fast measurements in harsh environments and provides the appropriate solution by suggesting the placement of the processing equipment in the borehole to one of ordinary skill in the art desiring a more accurate and faster response.

In view of our analysis above, we find that the teachings of Karaman and Lasseter, when considered as a whole, support the Examiner's § 103 ground of rejection. Thus, we sustain the 35 U.S.C. § 103(a) rejection of claims 17-20, 42-47, 49, 50, 52-56, 58-72, 75, 76, 78-81, and 83-91 over the teachings of Karaman and Lasseter.

Rejection of claims over Karaman, Lasseter, and Kluth

Regarding the rejection of claims 51, 57, 77, and 82 over Karaman, Lasseter, and Kluth, Appellants provide no additional arguments and merely rely on the arguments made for patentability of claims 17 and 64 above (Br. 14). Therefore, in light of our findings above, we find that the teachings of

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Kluth combined with Karaman and Lasseter suggest the subject matter of these claims. *See In re Young*, 927 F.2d at 590. *See also* 37 C.F.R. § 41.37(c)(1)(vii).

CONCLUSION

Because Appellants have failed to point to any error in the Examiner's position, we sustain the § 103 rejection of claims 17-20, 42-47, 49, 50, 52-56, 58-72, 75, 76, 78-81, and 83-91 over Karaman and Lasseter and of claims 51, 57, 77, and 82 over Karaman, Lasseter, and Kluth.

ORDER

The decision of the Examiner rejecting claims 17-20, 42-47, 49-72, and 75-91 is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. 1.136(a)(1)(iv).

AFFIRMED

tdl/gw

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