UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKANORI MIYASAKA, HIROTOSHI ARAMAKI, YASUSHI MUTOH, and SHINICHIRO ASAEDA

Appeal 2007-3850
Application 10/415,931
Technology Center 2800

Decided: May 8, 2008

Before MAHSHID D. SAADAT, ROBERT E. NAPPI, and KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's Final Rejection of the only claim pending, claim 1. We have jurisdiction under 35 U.S.C. § 6(b).

Appellants' invention relates to an anomaly diagnosis apparatus having a processing server that makes a diagnosis of data produced from one

or more sliding members and transmitted from a user information processing terminal to the processing server. (Spec. 10).

Claim 1 reads as follows:

1. An anomaly diagnosis apparatus of a machine installation for diagnosing the presence or absence of an anomaly in a sliding member used with the machine installation using sound, vibration, or temperature produced from the machine installation, said anomaly diagnosis apparatus having:

a diagnosis processing server and a user information processing terminal connected to a network, characterized in that

said user information processing terminal transmits sound, vibration, or temperature data produced from one or more sliding members used with the machine installation and information for identifying the one or more sliding members to said diagnosis processing server, and that

said diagnosis processing server makes an anomaly diagnosis of the machine installation based on the transmitted sound, vibration, or temperature data and specification data of the one or more sliding members based on the information for identifying them, and transmits the diagnosis result to said user information processing terminal.

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Canada	US 5,854,994	Dec. 29, 1998
Eryurek	US 2002/0123864 A1	Sept. 5, 2002 (provisional filed Mar. 1, 2001)[1]

[1] The Examiner determined, based on the evidence of record, that Appellants are not entitled to a foreign priority date earlier than March 1, 2001 (Final Rejection: 3, mailed Feb. 24, 2005). Appellants do not challenge that determination. Accordingly, Eryurek is considered prior art for this appeal.

Claim 1 stands rejected under 35 U.S.C. § 103 as being unpatentable over Canada in view of Eryurek.

We affirm.

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). "[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Furthermore, "'there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness' . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007)(quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

FINDINGS OF FACT

Canada

1. Canada discloses a central monitoring command station 6 which receives information from remote machine monitors 4 and processes the information to give an indication of the condition of the machines being

monitored. (Abstract, col. 5, ll. 6-20, Fig. 1). "[S]ensor data is fed . . . to a command station computer . . . where *the information is monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis*." (Col. 8, ll. 1-6) (emphasis supplied).

"If the analyzed data exceeds the threshold criteria," the analyzed data and an alert message generated at a machine monitor 4 is transmitted to the command station 6 (col. 11, l. 66 to col. 12, l. 9), and "[t]his data may be stored for later analysis or may be displayed in real-time, such as in a graphical plot of vibration versus time." (Canada, col. 12, ll. 29-31).

> Upon receipt of an alert message, the command station 6 notifies an operator and displays which machine monitor 4 is the source of the alert message. Based on the nature of the alert message, the operator may transmit further instructions from the command station 6 to the machine monitor 4 to carry out a different measurement or analysis operation, or the operator may take action to shut down the machine.

(Canada, col. 12, ll. 33-39) (emphasis supplied).

2. "It is desirable to monitor all of the machines from a central location in the plant, so that manufacturing personnel need not travel to each machine in the plant to assess its health." (Canada, col. 1, ll. 57-62). "It is desirable to detect and locate faults while the machine is operating in its normal environment so as not to interfere with the production process. Taking a machine off line to perform preventative maintenance creates an undesirable and inefficient situation . . . ." (Canada, col. 1, ll. 33-40). Canada's system seeks to prevent "a catastrophic failure of the machine with resultant loss of production capacity of the machine and possible injury to personnel." (Col. 1, ll. 23-25).

Eryurek

3. Eryurek discloses two separate embodiments, respectively depicted at Figures 1 and 32, that may or may not be interconnected, and each of which analyze data in a plant process environment (*see* pars. 0016, 0042, 0143). The first embodiment (Fig. 1) depicts an independent single plant system having a central computer 30 in a process control plant 10 that includes rotating equipment 20 connected to a maintenance computer system 22 which may store and execute known monitoring and diagnostic applications 23 (pars. 0050, 0056). The central computer 30 stores and executes an asset utilization expert 50, which collects data and other information, such as data generated from the analysis tools in maintenance system 22 and other maintenance and business systems (par. 0056). The asset utilization expert 50 receives information from, and may execute, data analysis tools such as typical maintenance data analysis tools including those involved in rotating equipment (par. 0063).

The asset utilization expert 50 can also execute index generation software 51 which creates indexes associated with the health, performance, etc. of a particular plant device or machine, including rotating equipment (par. 0057, 0132). A user, including an automated user, such as asset utilization expert 50, can request more diagnostics and detailed analysis if one of the indexes indicates a faulty machine, such as a motor (par. 0132).

The utilization expert 50 reports operating states or performance measures, including the indexes or sensor faults, to a wide variety of persons, functions, or systems, located anywhere in the plant, including process control expert systems, maintenance and business persons, and user interface routines, etc. (par. 0057, 0078, 0081).

4. Eryurek's second embodiment, depicted in Figure 32, employs a remote application service provider 914 which includes a server 950 and processors 952, and which links independent software vendors 902-906 with different independently operable plants 918 and 922, etc., to provide analysis at the remote service provider. (Figs. 32-33, Pars. 0042, 0141-0143). The processors 952 employ models 954 which model operational characteristics of various equipment types such as gas turbines, compressors, heat exchangers, pumps, etc. (Par. 0143). A wide variety of data analysis tools 958 and data, including such tools and data within such independently operable plants 10 as depicted in the Figure 1 embodiment, can be accessed by the remote processors 952 (pars. 0016, 0042, 0143).

OPINION

The Examiner determined that the combination of Canada and Eryurek renders the claimed invention obvious (Ans. 3). Specifically, the Examiner found that Canada discloses all the steps of claim 1 except the step of: "said diagnosis processing server makes an anomaly diagnosis . . . and transmits the diagnosis result to said user information processing terminal." The Examiner applied Eryurek to teach the missing step. (*See id.*).

Appellants argue that the combination of Canada and Eryurek is improper (App. Br. 10). Appellants contend that the purpose of Canada is to perform an anomaly diagnosis remotely at each machine monitor 4 (i.e., each "terminal") (App. Br. 11). According to Appellants, Canada's command station 6 (Fig. 1) (i.e. "server") performs monitoring only, not analysis, nor diagnosis as claimed. *Id*. Thus, Appellants conclude that employing Eryurek to modify Canada's server 6 so that it makes an anomaly

diagnosis "is entirely contrary to Canada's principle of operation, i.e., remote analysis with central monitoring." *Id*.

We are not persuaded by Appellants' arguments. While it is correct that Canada's remote terminals 4 generate a diagnosis, such as an alert message (FF 1), Canada also teaches an additional diagnosis at "a *command station* [server] which receives the transmission from the machine monitors [terminals] and *processes* the information to give an indication of the condition of the machine." (Abstract) (emphasis supplied). "[S]ensor data is fed . . . to a command station computer . . . *where the information is monitored in real-time for machine fault conditions and is entered into a data base for off-line trend analysis*." (FF 1). That is, we determine that command station (i.e. "server") processing and monitoring of data for faults and conditions, at a minimum suggests, if not discloses, server diagnosis.

More particularly, in Canada's system, analyzed data exceeding a threshold criterion is sent with an alert message generated at a machine monitoring terminal 4 to the central monitoring command station server 6 and "[t]his data may be stored for later analysis or may be displayed in real-time, such as in a graphical plot of vibration versus time" (FF 1). The operator at the command station server 6 ultimately determines (i.e., diagnoses) which action to take based on the analyzed data (FF 1). For example, the operator performs an anomaly diagnosis to determine if the machine should be shut down or if more analysis is required to make the determination (FF 1). We determine that monitoring data for a fault in real time, shutting down a machine, and/or requiring or performing more analysis, are forms of diagnosis. Thus, *some diagnosis* is performed at the central command station server 6.

We turn to Appellants' related argument: "[I]t is clear that the '**central function of the invention** [is] the **remote monitoring and analysis** of machine characteristics'…, i.e., sensing and analyzing the signals at the machine monitor 4 itself, then sending a signal indicative of the analysis result to a central location for viewing at the command station 6." (Reply Br. 4, quoting Canada, col. 9, ll. 46-51)(emphasis by Appellants). The argument minimizes the function of the command station by characterizing it as allowing mere viewing.

Ultimately, Canada's main purposes, preventing personnel injury, catastrophic failure of machines, and inefficient maintenance thereof (FF 2), are interrelated as one central purpose focused on a safe, efficient plant environment. That purpose is achieved by central monitoring, analysis, and diagnosis at the command station 6 (FF 1, 2) (i.e., at the server), as opposed to mere viewing of data. Not only is central command station diagnosis performed, such as general data processing, fault monitoring, or trend analysis, as we discussed *supra*, more particularly, machine data exceeding a certain threshold is sent to the command station (FF 1). There would be no need to send such data unless further diagnosis, i.e., to refine the threshold, were to be performed, either immediately by a human operator or later for trend fault analysis (*see* FF 1).

Therefore, we agree with the Examiner that "modifying Canada to allow analysis of monitored data at the command station or other central location would not change the principal of operation of monitoring data from one or more machines at [a] remote monitoring station" (Ans. 4). As the Examiner recognized, Eryurek suggests server diagnosis and transmission back to the machine user so that the machines (i.e. "terminals") can

"concentrate on their core competencies while allowing the maintenance and diagnosis of problems with machines to be handled elsewhere" (Ans. 3; citing Eryurek, pars. 0013-15).[2]

Appellants' response is that "Eryurek's benefit of allowing machine operators to focus on their core competencies arises from allowing the analysis to be performed at a second location different from the one plant in which the machines are located." (Reply Br. 5). As Appellants' argument goes, Canada's operators are already at the local plant and need no central analysis from a second remote location. (Reply Br. 4-5). In other words, "one of ordinary skill –following the teachings of the references as a whole – would not have been motivated to apply Eryurek's two-location teaching to Canada's one plant system" (App. Br. 11-12). We are not persuaded by Appellants' response.

Eryurek teaches two embodiments that may or may not be interconnected, a two-location system (performing either local or remote diagnosis inside or outside a plant) (Fig. 32) and a one-location system (performing local diagnosis within a plant) (Fig. 1), with cost savings via efficiency and optimization gains realized under each system (n. 2; *see also* FF 3, 4).[3] Data analysis can be performed at virtually any computer in either

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[2] Focusing on core competencies produces cost reductions not only due to machine and physical control system efficiency and optimization, but also due to business and operating efficiency - information sharing promotes efficiency gains and optimization in accounting, production, maintenance planning, and customer ordering systems such as parts, raw materials, etc. (*See* Eryurek, pars. 0013, 0052, 0054, 0057).

[3] Eryurek states that analysis tools and data in the *independently operable* local plant embodiment (Fig. 1) *may* be accessed by the multi-plant embodiment (Fig. 32) (FF 4). Whether the two embodiments are inter-

system (i.e., at a "server"), and the results thereof transmitted to a multitude of users virtually anywhere in the plant system(s) (FF 3, 4).

Thus, Eryurek's server diagnosis, wherever performed, results in cost reductions obtained by information sharing. We also find that the location of the analysis and/or diagnosis, whether it be inside or outside of a plant, would be transparent to any end user, since required analysis/diagnosis results are transmitted as needed to user terminals and/or systems in the plant (*see* FF 3, 4). Consequently, Eryurek suggests that Canada's system, which similarly involves rotating machine data analysis and transmission thereof to a central server for further analysis and diagnosis, in order to efficiently prevent machine failure (FF 1), also would have benefited predictably from Eryurek's seamless cost saving system. For example, Canada's human operator, whose presence is required to monitor data in real time to determine whether to shut down a faulty machine (FF 1), could be replaced by an automated diagnosis system, as Eryurek suggests (*see* FF 3).

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different field. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

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connected is not material to our decision. We find the full import of Eryurek's teachings to be that cost savings by way of efficiency and optimization gains are obtained regardless of any interconnection. (*See e.g.* pars. 0007-0014, 0053).

KSR, 127 S.Ct. at 1740.

We determine that market forces and design incentives to optimize plant machine and business systems by performing higher level diagnosis in a server and core data gathering and/or lower threshold diagnosis at a terminal, as suggested by Eryurek, would have required a minimal variation and predictable improvement of Canada's similar plant machine monitor system, thereby furthering Canada's goal of preventing personnel injury and costly machine failure and maintenance. Accordingly, we will sustain the obviousness rejection of claim 1.

ORDER

The decision of the Examiner rejecting claim 1 under 35 U.S.C. § 103 is affirmed.

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

AFFIRMED

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