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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHARLES MICHAEL MCQUADE, BRETT BRINTON,
and GREG COLVIN

Appeal 2019-002022
Application 15/231,142
Technology Center 3600

Before MURRIEL E. CRAWFORD, PHILIP J. HOFFMANN, and
BRADLEY B. BAYAT, *Administrative Patent Judges.*

BAYAT, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the
Examiner's decision to reject claims 1–7 and 9–21, which are all the claims
pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R.
§ 1.42. Appellant identifies the real party in interest as Zonar Systems, Inc.
Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claims are directed to a cooperative vehicle diagnosis system.

Claim 12, reproduced below, is illustrative of the claimed subject matter:

> 12. A method, comprising:
> defining a ring buffer in a memory of an onboard vehicle data collection device;
> collecting operational data passed through a plurality of vehicle data inputs;
> storing the operational data in the ring buffer such that current operational data written into the ring buffer overwrites previous operational data previously written into the ring buffer;
> detecting when operational data passed through at least one of the plurality of vehicle data inputs crosses a threshold;
> based on the detecting:
> asserting a fault code corresponding to a vehicle-based device that generated at least some of the operational data and corresponding to the threshold;
> communicating, via a wireless data link, fault code data associated with the asserted fault code to a remote computing device; and
> communicating, via the wireless data link, a predetermined amount of operational data from the ring buffer to the remote computing device, the predetermined amount of operational data including operational data associated with the asserted fault code and operational data not associated with the asserted fault code, wherein the predetermined amount of operational data includes a first amount of data that was stored in the ring buffer before the fault code was asserted and a second amount of data that was stored in the ring buffer after the fault code was asserted.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Petchenkine	US 6,380,951 B1	Apr. 30, 2002
Lowrey	US 2002/0133273 A1	Sept. 19, 2002
Sowa	US 2006/0089767 A1	Apr. 27, 2006
Louch	US 2008/0167758 Al	July 10, 2008

REJECTIONS

Claims 1–7 and 9–21 are rejected under 35 U.S.C. § 101 as being directed to a judicial exception without significantly more.

Claims 1–3, 11–14, 17, and 18 are rejected under 35 U.S.C. § 102(b) as being anticipated by Louch.

Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Louch and Petchenkine.

Claims 6, 9, 10, 15, 16, 19, and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Louch and Lowrey.

Claims 7 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Louch and Sowa.

OPINION

Rejection under 35 U.S.C. § 101

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Alice*, 573 U.S. at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores" (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 187; *see also id.* at 191 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having

4

said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an 'inventive concept' sufficient to 'transform' the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (quotation marks omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (quoting *Mayo*, 566 U.S. at 77).

The PTO recently published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Guidance"). Under the Guidance, we first look to whether the claim recites:

> (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
> (2) additional elements that integrate the judicial exception into a practical application (*see* Manual of Patent Examining Procedure ("MPEP") § 2106.05(a)–(c), (e)–(h)).

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Guidance.

Step One of the Alice Framework (*2019 Guidance*, *Step 2A*)

Under the first step of the *Alice* inquiry, the Examiner determined "the claims are directed towards monitoring vehicle activity which is considered to be an abstract idea inasmuch as operating a vehicle, passing information, capturing information, storing information, detecting events (by comparing the stored data with trigger elements), copying information, and communicating the information to a remote site are activities that are considered both methods of organizing activity and an idea of itself." Final Act. 3.

Other than arguing that devices such as "a remote computing device, a vehicle data bus, a ring buffer, a fault detection mechanism, and a wireless data link . . . are inherently not abstract" (Appeal Br. 15) (emphasis omitted), Appellant does not dispute the Examiner's characterization of the abstract idea under Step 2A, i.e., why the above identified steps cannot be considered methods of organizing activity, which fall under grouping (b) of the Guidance, or a mental process under grouping (c). *See* Guidance, 84 Fed. Reg. 52.

Notwithstanding the propriety of the Examiner's determination as to whether the claims are directed to the identified abstract idea, we agree with Appellant that the Examiner has erred by failing to show adequately that the

additional elements would not amount to significantly more than the abstract idea.

Step Two of the Alice Framework (2019 Guidance, Step 2B)

A claim may recite additional elements that render the claim patent eligible even though a judicial exception is recited in a separate claim element.[2] The Federal Circuit has held claims eligible at the second step of the *Alice* framework (*Step 2B*) because the additional elements recited in the claim provided "significantly more" than the recited judicial exception (e.g., because the additional elements were unconventional in combination).[3] Therefore, if a claim has been determined to be directed to a judicial exception under *Revised Step 2A*, we must evaluate the additional elements individually and in combination under *Step 2B* to determine whether they provide an inventive concept (i.e., whether the additional elements amount to significantly more than the exception itself). The patent eligibility inquiry may contain underlying issues of fact. *Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016). In particular, "[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact." *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

In the *Step 2B* analysis, an additional element (or combination of elements) is not well-understood, routine or conventional unless the

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[2] *See, e.g.*, *Diehr*, 450 U.S. at 187.

[3] *See, e.g.*, *Amdocs Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300, 1304 (Fed. Cir. 2016); *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349–52 (Fed. Cir. 2016); *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257–59 (Fed. Cir. 2014).

examiner finds an evidentiary basis, and expressly supports a rejection in writing with, one or more of the following:

> 1. A citation to an express statement in the specification or to a statement made by an applicant during prosecution that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .
> 2. A citation to one or more of the court decisions discussed in MPEP § 2106.05(d)(II) as noting the well-understood, routine, conventional nature of the additional element(s).
> 3. A citation to a publication that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .
> 4. A statement that the examiner is taking official notice of the well-understood, routine, conventional nature of the additional element(s).

See Berkheimer Memo 3–4.[4]

Appellant contends the Examiner is incorrect in the assertion that the "claims require no more than a generic computer to perform generic computer functions that are well understood, routine and conventional activities previously known to the industry." Appeal Br. 14–15 (emphasis omitted). According to Appellant, the claims actually recite, in the apparatus claim, a remote computing device, a vehicle data bus, a ring buffer, a fault detection mechanism, and a wireless data link. *Id.* at 15. Based on this, the Appellant argues that because the Examiner only addresses the "ring buffer," the rejection is inconsistent with the Office's "*Berkheimer* Memo" guidance. *Id.* at 15–16.

We are persuaded by Appellant's argument.

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[4] USPTO Commissioner for Patents Memorandum dated Apr. 19, 2018, "Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)" (hereinafter "*Berkheimer* Memo").

The Examiner finds all claims are directed to "monitoring vehicle activity." Final Act. 3. Using claim 12 as an example, the additional elements recited that are not part of the asserted abstract idea include at least the following steps and components:

> defining a ring buffer in a memory of an onboard vehicle data collection device;
> detecting when operational data passed through at least one of the plurality of vehicle data inputs crosses a threshold;
> asserting a fault code corresponding to a vehicle-based device that generated at least some of the operational data and corresponding to the threshold;
> communicating, via a wireless data link, fault code data associated with the asserted fault code to a remote computing device; and
> communicating, via the wireless data link, a predetermined amount of operational data from the ring buffer to the remote computing device.

The components not part of the alleged abstract idea thus include a "ring buffer," a "memory," an "onboard vehicle data collection device," a "vehicle-based device that generated . . . data," a "wireless data link," and a "remote computing device."

In response to the Appellant's argument, regarding *Berkheimer*, the Examiner repeats that the "claims require no more than a generic computer to perform generic computer functions that are well-understood, routine and conventional activities previously known to the industry." Answer 25. In support of this, the Examiner asserts, without evidence, that the "vehicle data bus [in claim 1] which is an element not only found in the applied art but standard on cars mandated by the implementation of the OBDII sensor something also shown in the applied art." *Id.* The Examiner also asserts the "ring buffer is a software or hardware memory construct also found in the

applied art and known in various text books." *Id.* In support of this assertion, the Examiner cites, indirectly, to Malcolm G. Lane, "Data Communications Software Design," Boyd & Fraser Pub. Co., 1985, p. 246, and Zdravko Karakehayov, et al., "Embedded Systems Design with 8051 Microcontrollers: Hardware and Software," Marcel Dekker, Inc., 1999, p. 186. *Id.*

At best, Lane discloses "it is possible to allow the receiver interrupt handler do software buffering of characters from a line while the line has no MLREAD pending. To implement this, a simple FIFO circular buffer or ring bugger RING is set up." Lane at 246. Karakehayov discloses a "popular scheme is the ring or circular buffer. Figure 6.14 illustrates the operation of an example ring buffer. In fact, it is a receive ring buffer which we use in the following version of the terminal emulator program." Karakehayov at 186. Even if the two cited references provide evidence that a ring buffer is a well-understood, routine, and conventional device, the Examiner does not establish with evidence that it is well-understood, routine, and conventional to employ a ring buffer "in a memory of an onboard vehicle data collection device," as claimed in claim 12. Further, the Examiner asserts, again without supporting evidence, that the "wireless data link is any type of wireless data link generic in nature." Answer 26.

Moreover, the Examiner makes no attempt to establish, using evidence, that the remaining additional elements of the claims, beyond the scope of the alleged abstract idea, both alone and in the particular combination claimed, are well-understood, routine, and conventional.

The Examiner's findings on these issues, if addressed at all, are conclusory and unsupported and, therefore, insufficient to show that the purported facts are well-understood, routine, and conventional. *See*

10

Berkheimer, 881 F.3d at 1369 ("Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination."). The two references, addressing but one claim element, are insufficient to establish whether the recited "additional element" components and steps are well-understood, routine, and conventional in the computing arts. *See id.* ("Whether a particular technology is well-understood, routine, and conventional goes beyond what was simply known in the prior art. The mere fact that something is disclosed in a piece of prior art, for example, does not mean it was well-understood, routine, and conventional.").

Because the Examiner has failed to meet the requirements under Step 2B of the Guidance, we do not sustain the rejection of claims 1–7 and 9–21 under 35 U.S.C. § 101 as being directed to a judicial exception without significantly more.

Rejection of claims 1, 2, 12–14, 17, and 18 under 35 U.S.C. § 102(b)

Appellant argues claims 1, 12, and 17 together as a group, because Appellant asserts that arguments made with respect to independent claim 1 can be applied to independent claims 12 and 17. Appeal Br. 39. Pursuant to 37 C.F.R. § 41.37, we select claim 12 as representative.

In particular, Appellant argues none of the three logging methods disclosed in Louch teach "a *ring buffer* that stores **a first amount of data** captured **_before_ the fault code was asserted** and **a second amount of data** captured **_after_ the fault code was asserted**." Appeal Br. 31–32; *see also* Reply Br. 9–10.

We are not persuaded by Appellant's argument that the "data logging" function in Louch fails to disclose the claim language because "in *Louch* at

[0049], *Louch* simply teaches producing a data log 232 of signal values trending over time." Appeal Br. 37. Louch explains that "it is advantageous to the diagnosis and remediation of a vehicle problem to gather and record data before, at the occurrence of and for some time after the occurrence of a fault." Louch ¶ 8. Louch details that "[d]ata logging is acquisition of signal values from vehicle network messages as transmitted over the vehicle networks 206 and 208, producing in a data log 232 containing a sequential table of signal values." *Id.* ¶ 49. The "data log 232 may be implemented as a circular queue wherein if the allocated memory limit for the data log 232 is reached the oldest values in the data log may be overwritten with newer values as necessary to stay within the allocated memory." *Id.* The data logging function uses a circular queue, limited by its predetermined memory limit, and because it records data continuously, it captures data before and after faults. The data is transmitted over a wireless data link, as disclosed by Louch:

> [T]he diagnostic service device queries for, receives and gathers vehicle sensor signal and vehicle management system diagnostic data over the wireless network from the vehicle network gateway. Gathered data may include any portion of available real-time or dynamic vehicle signal data, such as sensor measurements, as well as error codes and data from vehicle network gateway generated logs such as trigger logs, strobe logs, and data logs and real-time statistics.

Id. ¶ 56. Because Louch's data logging meets the claim language, we do not reach Appellant's further arguments about trigger and strobe logging.

Therefore, we sustain the Examiner's rejection of claims 1, 12, and 17 as anticipated by Louch. We also sustain the anticipation rejection of claims 2, 13, 14, and 18, which are not argued separately.

Rejection of claim 3 under 35 U.S.C. § 102(b)

Dependent claim 3 recites "wherein the ring buffer is a first-in, first-out [FIFO] buffer." Appeal Br. 43 (Claims App.)

We not persuaded by Appellant's argument that "there is no teaching found in *Louch* where any buffer is configured as a FIFO buffer," because the Examiner construes "FIFO buffer incorrectly" to include "data that is first in is the first to be removed or overwritten," and "[d]ata comes in and is over written [sic] as new data comes in." Appeal Br. 39–40. Appellant asserts, without citation to any evidence, that a "FIFO buffer, unless so configured, will not automatically overwrite it[]s data. If a FIFO buffer is full, the writing of new data will be suspended until the current data is removed and a read index is advanced." *Id.* at 39; *see also* Reply Br. 10–12.

The Specification does not define the term "first-in, first-out buffer," and we do not discern a description of the operation of a first-in, first-out buffer that corresponds to Appellant's assertion. However, the Specification describes that "Buffer 108 can be implemented as a first in, first out buffer that temporarily stores the operational data generated by the vehicle in normal operation, which conventionally is generated and discarded rather than being saved." Spec. ¶ 58. This description is not inconsistent with the Examiner's interpretation, but it does not support Appellant's proposed construction.

In response, the Examiner cites to external sources to support the construction as being the ordinary and customary meaning of a FIFO queue. Answer 37. Appellant points to the source cited, and quoted in part by the Examiner, which states, additionally:

> A FIFO is useful for buffering a stream of data between a
> sender and receiver which are not synchronised - i.e. not

13

> sending and receiving at exactly the same rate. Obviously if the rates differ by too much in one direction for too long then the FIFO will become either full (blocking the sender) or empty (blocking the receiver). A Unix pipe is a common example of a FIFO.

Reply Br. 11 (citing http://foldoc.org/fifo). This, according to Appellant, means "if a FIFO buffer is full, no new data can be added." Reply Br. 12.

The Examiner has the better position for the construction of this disputed term. The portion of the definition Appellant relies on deals with an overrun condition where data is coming in too fast to be send along. The sending along of data, as in a Unix pipe, corresponds to being erased. As a result, Appellant has not shown error in the Examiner's reliance on Louch as disclosing the claimed first-in, first-out buffer. Thus, we sustain the anticipation rejection of claim 3.

Rejection of claim 11 under 35 U.S.C. § 102(b)

Dependent claim 11 recites, in part, "the remote computing device is arranged to communicate a plurality of fault codes and at least one threshold associated with each of the plurality of fault codes to the onboard vehicle data collection device." Appeal Br. 44 (Claims App.)

Appellant argues: "No teaching of the claimed communications from the remote computer **to** the vehicle is found in *Louch*," and that the claim "recites more than simply communications 'sent to and received from the vehicle.'" Appeal Br. 40.

The Examiner finds the claim language is disclosed in paragraphs 42 and 46 of Louch. Final Act. 8, 40; *see also* Answer 38–39.

Louch discloses that on-vehicle code enables "bridging of vehicle messages between the vehicle networks and external networks" in order to

"monitor, send and receive network messages . . . The message database contains . . . signal definition and signal range parameters for vehicle sensor and control devices with are interfaced and in communication with the vehicle networks." Louch ¶ 46. The Examiner has demonstrated that, because the vehicle can receive signal definition and range parameters from external networks into the vehicle systems, Louch discloses communicating "fault codes and at least one threshold associated with each of the plurality of fault codes to the onboard vehicle data collection device," as required by claim 11. Therefore, we are not persuaded of error by the Examiner, and sustain the rejection of claim 11 as anticipated by Louch.

Rejections under 35 U.S.C. § 103(a)

Appellant does not advance any arguments contesting any of the rejections under 35 U.S.C. § 103, and instead asserts that the only grounds of rejection to be reviewed on appeal are the rejections under 35 U.S.C. § 101 and 35 U.S.C. § 102(b). *See* Appeal Br. 10–11. Therefore, we sustain the rejections of claims 4–7, 9, 10, 15, 16, and 19–21 under 35 U.S.C. § 103(a).

CONCLUSION

The Examiner's rejection under 35 U.S.C. § 101 is REVERSED.

The Examiner's rejection under 35 U.S.C. § 102(b) is AFFIRMED.

The Examiner's rejections under 35 U.S.C. § 103(a) are AFFIRMED.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–7, 9–21	101	Eligibility		1–7, 9–21
1–3, 11–14, 17, 18	102(b)	Louch	1–3, 11–14, 17, 18	
4, 5	103(a)	Louch, Petchenkine	4, 5	
6, 9, 10, 15, 16, 19, 21	103(a)	Louch, Lowrey	6, 9, 10, 15, 16, 19, 21	
7, 20	103(a)	Louch, Sowa	7, 20	
Overall Outcome:			1–7, 9–21	

TIME PERIOD FOR RESPONSE

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

16