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BROOKS KUSHMAN P.C./FGTL
1000 TOWN CENTER
22ND FLOOR
SOUTHFIELD, MI 48075-1238

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JOVAN MILIVOJE ZAGAJAC,
ARUN CHOPRA, VASILIIY V. KRIVTSOV, and
OLEG YURIEVITCH GUSIKHIN¹

Appeal 2017-009528
Application 14/563,101
Technology Center 3600

Before JOHN C. KERINS, EDWARD A. BROWN, and
ANNETTE R. REIMERS, *Administrative Patent Judges*.

REIMERS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Jovan Milivoje Zagajac et al. (Appellants) appeal under 35 U.S.C. § 134(a) from the Examiner’s decision to reject claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Ford Global Technologies, LLC is indicated as the “real party in interest” and is also the applicant pursuant to 37 C.F.R. § 1.46. Appeal Brief 2 (hereinafter “Appeal Br.”) (filed Feb. 15, 2017).

CLAIMED SUBJECT MATTER

The claimed subject matter “generally relate[s] to a method and apparatus for connected vehicle system wear estimation and maintenance scheduling.” Spec. ¶ 1; Figs. 2A, 2B, 4. Claims 1, 8, and 15 are independent.

Claim 1 is illustrative of the claimed subject matter and recites:

1. A system comprising:
 - a processor configured to:
 - receive vehicle identifying data;
 - receive vehicle-system wear-related data, including at least ambient environmental data, based on a utilization of the vehicle-system;
 - determine a projected vehicle-system wear-state based on comparison of aggregated system wear-related data values to data values of the same data types gathered from vehicles for which wear measurements were taken; and
 - recommend vehicle-system servicing if the projected wear-state exceeds a replacement threshold.

THE REJECTIONS

- I. Claims 1–20 stand rejected under 35 U.S.C. § 101, as being directed to patent-ineligible subject matter.
- II. Claims 1–4, 7–11,² and 15–18 stand rejected under 35 U.S.C. § 102(a) as anticipated by Fiechter (US 2003/0114965 A1, published June 19, 2003).

² The header of this rejection lists claims 1–4 and 15–18 as being anticipated by Fiechter. Final Office Action 4 (hereinafter “Final Act.”) (dated Sept. 22, 2016). However, the body of the rejection includes a discussion of claims 7–11. Final Act. 6–7. We understand the omission of claims 7–11 from the

II. Claims 1–20 stand rejected under 35 U.S.C. § 103 as unpatentable over Fiechter and Itatsu (US 2014/0100738 A1, published Apr. 10, 2014).

ANALYSIS

Rejection I – Patent-Ineligible Subject Matter

Claims 1–20

Appellants do not offer arguments in favor of claims 2–20 separate from those presented for independent claim 1. *See* Appeal Br. 6–7; *see also* Reply Br. 2–3.³ We select claim 1 as the representative claim, and claims 2–20 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

In rejecting claim 1 under 35 U.S.C. § 101, the Examiner applies the two-step framework set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1296–97 (2012) and reiterated in *Alice Corp. Pty. Ltd. v. CLS Bank International*, 134 S. Ct. 2347, 2355 (2014), which considers, in the first step, whether the claims are “directed to” a patent-ineligible concept, e.g., an abstract idea, and then, in a second step, whether the claims, individually and as an ordered combination, recite an inventive concept—an element or combination of elements sufficient to ensure the claims amount to “significantly more” than the abstract idea and transform the nature of the claims into a patent-eligible concept.

Pursuant to the first step of the analysis, the Examiner determines that the claims are directed to the abstract idea of “comparing new and stored

header as being a typographical error and claims 1–4, 7–11, and 15–18 to be rejected under 35 U.S.C. § 102(a) as anticipated by Fiechter. *See also* Examiner’s Answer 2 (hereinafter “Ans.”) (dated Apr. 28, 2017).

³ Reply Brief (hereinafter “Reply Br.”) (filed June 28, 2017).

information and using rules to identify options,” which entails nothing more than “a system[] and a non-transitory computer readable storage medium to ‘receive . . . data[,]’ ‘determine . . . a state[,]’ and ‘recommend vehicle-system servicing.’” Final Act. 2–3.

Indeed, our reviewing courts have held claims ineligible under § 101 when directed to data tracking/gathering and data analysis. *See Electric Power Group v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016) (quoting *SmartGene, Inc.*,⁴ in which “analyzing information” was found to be an abstract idea). Similar to claim 1, the claims in *SmartGene, Inc.* and *Electric Power Group* are directed to data analysis. The claims in *Electric Power Group* are even more like claim 1, in that they are both directed to gathering and analyzing information and then presenting results, without any particular asserted inventive technology for performing those functions. *See* Final Act. 4; Ans. 4; *Electric Power Group* at 1354.

Although Appellants direct our attention to Example 35 of the December 2016 Guidance issued by the Office, Appellants do not provide an explanation as to why the claims are not directed to the abstract idea set forth by the Examiner. Rather, Appellants’ arguments merely restate and summarize claim limitations. Appeal Br. 6; *see also* Reply Br. 2–3.

Moreover, according to Appellants, “present[ed] [is a] novel concept of attempting to estimate when a system will need replacement, without solely relying on actual measurement of the system itself.” Appeal Br. 6.

However, as the Examiner correctly points out, the features of a system not

⁴ *SmartGene, Inc. v. Advanced Biological Labs., S.A.*, 555 F. Appx. 950 (Fed. Cir. 2014).

solely relying on actual measurement “do not appear to actually be recited in the instant claims.” Ans. 3; *see In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (Limitations not appearing in the claims cannot be relied upon for patentability).

Because claim 1 involves merely the concept of tracking and analyzing information, which the case law precedent cited above characterizes as being directed to an abstract idea, we agree with the Examiner’s determination that claim 1 is directed to an abstract idea. Final Act. 2–3; Ans. 4.

We now address the second step of the *Alice* framework. Under the second step, the Examiner determines that the claims do not recite additional limitations amounting to significantly more than the claimed abstract idea, because the additional limitations only involve routine and conventional activity. Final Act. 3. In particular, the Examiner finds that “[t]he claim(s) recite(s) the additional limitations of ‘a processor,’” and that “[t]he hardware is recited at a high level of generality and are recited as performing generic computer functions routinely used in computer applications.” *Id.* The Examiner explains that “[g]eneric computer components recited as performing generic computer functions that are well-understood, routine and conventional activities amount to no more than implementing the abstract idea with a computerized system,” and thus, “taken alone, the additional elements do not amount to significantly more than the above-identified judicial exception (the abstract idea)” and “[l]ooking at the limitations as an ordered combination adds nothing that is not already present when looking at the elements taken individually.” *Id.* at 3–4.

Appellants note that they present a “novel concept of attempting to estimate when a system will need replacement, without solely relying on actual measurement of the system itself.” Appeal Br. 6. Appellants further argue that “usage and environmental data are gathered when the system is used, and this data is used as a comparison to a model,” that “[t]he model is formulated through usage data gathered with respect to vehicles that actually underwent repair,” and that “[t]his presents an improvement to the idea of computerized maintenance recommendations, and also allows for vehicles with sensors that do not have to measure every aspect of a system in order to advocate maintenance.” *Id.* at 6–7; *see also* Reply Br. 2.

Appellants’ arguments are not persuasive. As discussed above, the features of a system not solely relying on actual measurement are not claimed. Further, claim 1 does not include limitations directed to use of a particular model or use of data gathered with respect to vehicles that actually underwent repair. *See* Ans. 3; *see also* Appeal Br. 6–7; *In re Self*, 671 F.2d at 1348.

Although Appellants refer to computerized maintenance recommendations, they do not identify any specific features recited in the claims that result in improvements to another technology or technical field or are beyond well-understood, routine, conventional activity. Appeal Br. 6–7; Reply Br. 2–3.

We note Appellants’ contention that they “present[] a novel concept” and that “the Examiner would need a showing of common usage (or common sense, supported by a sufficient explanation) to demonstrate that the claimed invention was mere computerization of a common practice.” Appeal Br. 6–7. However, even assuming that claim 1 is “a novel and

nonobvious” modification, as the Supreme Court has stated, “[t]he ‘novelty’ of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.” *Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981). Further, as the Examiner points out, “[t]he use of generic computer components that perform the generic functions of [e.g. ‘transmitting information’, ‘generating information’] common to electronics and computer systems does not impose any meaningful limit on the computer implementation of the abstract idea.” Final Act. 3–4; *see also* Spec. ¶ 44 (disclosing that “a general purpose processor may be temporarily enabled as a special purpose processor for the purpose of executing some or all of the exemplary methods shown herein”). The Examiner further explains that “[t]here is no indication that the combination of elements improves the functioning of a computer or improves another technology or technical field,” and that “[t]heir collective functions merely provide conventional computer implementation (i.e. mere instructions to implement the abstract idea on a generic computing system).” Ans. 4; *see also* Final Act. 4. Thus, we are not apprised of Examiner error based on this argument.

Based on the foregoing, we fail to see how the claimed invention is something other than data tracking/gathering and data analysis. Accordingly, claim 1, when its limitations are considered both individually and as an ordered combination, amounts to nothing more than an attempt to patent the abstract idea embodied in the steps carried out by a processor. Thus, the additional limitations of claim 1 fail to transform the nature of the claim into patent-eligible subject matter.

For the above reasons, Appellants fail to apprise us of error in the Examiner's determination that claim 1 is directed to patent-ineligible subject matter. Accordingly, we sustain the Examiner's rejection of claim 1 as being directed to patent-ineligible subject matter. We further sustain the Examiner's rejection of claims 2–20, which fall with claim 1.

Rejection II – Anticipation by Fiechter

Claims 1–4, 7, and 15–18

Appellants do not offer arguments in favor of claims 2–4, 7, and 15–18 separate from those presented for independent claim 1. *See* Appeal Br. 7–11; *see also* Reply Br. 3–4. We select claim 1 as the representative claim, and claims 2–4, 7, and 15–18 stand or fall with claim 1. Appellants offer separate arguments in favor of claim 8. *See* Appeal Br. 10–11; *see also* Reply Br. 3–4. We address claim 8 and its dependent claims 9–11 separately below.

Claim 1 is directed to a “system” comprising “a processor configured to” “receive vehicle-system wear-related data, including at least ambient environmental data, based on a utilization of the vehicle-system”⁵ and “determine a projected vehicle-system wear-state based on comparison of aggregated system wear-related data values to data values of the same data types gathered from vehicles for which wear measurements were taken.” Appeal Br. 13, Claims App. The Examiner finds that Fiechter discloses a system having all the limitations of claim 1. Final Act. 4–5 (citing Fiechter

⁵ We note that “the vehicle-system” lacks antecedent basis. *See* Appeal Br. 13, Claims App.

¶¶ 29, 33–36, 38, 45, 57–59, 69, 74, 100; Table 2). More particularly, the Examiner finds that Fiechter discloses a processor configured to receive vehicle-system wear related data (“[t]he maintenance status information contains . . . wear information of vehicle components”), including at least ambient environmental data (“environment[al] temperature, atmospheric pressure”) based on a utilization of the vehicle-system (“collect data from vehicle during utilization of vehicle”). *Id.* at 4. The Examiner explains that Fiechter discloses the step of receiving vehicle-system wear-related data “based on a utilization of the vehicle-system” because under a broadest reasonable interpretation, the limitation merely requiring that the data is obtained when the system is being used. *Id.* at 5 (citing Fiechter ¶ 45).

Appellants contend that Fiechter does not disclose receiving vehicle-system related wear data “based on a utilization of the vehicle-system,” and determining a projected vehicle-system wear-state “***based on comparison of aggregated system wear-related data values to data values of the same data types gathered from vehicles for which wear measurements were taken.***” Appeal Br. 10; *see also* Reply Br. 4. More particularly, Appellants argue that, of the data from the cited portions of Fiechter, “it appears to be data gathered throughout the entire course of a journey,” and that “[t]here is certainly no teaching of receiving wear-related data from ‘a vehicle system-utilization event’ or determining a projected ‘system wear-state’ based on comparison of the received data to similar data received from other vehicles for which wear was actually measured.” Appeal Br. 10; *see also* Reply Br. 4.

Fiechter discloses a “vehicle monitoring system,” which, “through the use of machine learning and data mining technologies on data acquired *from*

a plurality of vehicles to create models,” “enable[s] *comparison with the created models* to provide continuing analysis of the vehicle with respect to repair, maintenance and diagnostics.”⁶ Fiechter, Abstract (emphasis added); *see also id.* at ¶¶ 29, 34, 35, 37, 38; Final Act. 4–5; Ans. 5–7. Fiechter further discloses that “[t]he existing classical diagnostics and maintenance systems operate using algorithm based on . . . statistical models,”⁷ and “[c]ollect[ing] data from vehicle during utilization of vehicle.” *Id.* at ¶¶ 35, 45; Final Act. 4–5; Ans. 5–7. As such, Appellants do not provide sufficient evidence or argument apprising us of error. Additionally, we note that, although claim 1 requires the reception of vehicle-system wear-related data based on a utilization of the vehicle-system, the claim does not exclude gathering data “throughout the entire course of a journey,” and does not require “a vehicle system-utilization event.” *See In re Self*, 671 F.2d at 1348.

In summary, and based on the record presented, we are not persuaded the Examiner erred in rejecting independent claim 1 as anticipated by Fietcher. Accordingly, we sustain the Examiner’s rejection of claim 1 as anticipated by Fietcher. We further sustain the Examiner’s rejection of claims 2–4, 7, and 15–18, which fall with claim 1.

⁶ We note that the Specification similarly discloses that “[t]he modeling process may then use the received data, in conjunction with one or more models or algorithms to calculate projected wear on the brake pads and other brake parts.” Spec. ¶ 55.

⁷ We note that the Specification similarly discloses that “[b]y providing this calculation for a large number of vehicles, a statistical model of maintenance events as a function of vehicle duty cycle and location/environment can be obtained.” Spec. ¶ 34.

Claims 8–11

Appellants do not offer arguments in favor of dependent claims 9–11 separate from those presented for independent claim 8. *See* Appeal Br. 10–11; *see also* Reply Br. 3–4. We select claim 8 as the representative claim, and claims 9–11 stand or fall with claim 8.

Independent claim 8 is similar to independent claim 1, but claim 8 specifies “brake wear-related data” instead of the more general “wear-related data.” Appeal Br. 13–15, Claims App. The Examiner finds that Fiechter discloses “brake wear-related data” as a type of “wear-related data” within its system. *See* Final Act. 7 (citing Fiechter ¶¶ 3, 33–36).

Appellants contend that Fiechter’s paragraph 3 “teaches nothing more than that a sensor which measured [brake] pad wear can be processed to determine [brake] pad wear” and relates to “prior art” systems. Appeal Br. 10–11. As such, Appellants argue that Fiechter’s paragraph 3 “has no particular tie-in to paragraphs 33–36.” *Id.* at 11.

This argument is unpersuasive as paragraphs 33–36 of Fiechter by themselves disclose the “brake wear-related data.” *See* Final Act. 7. In other words, even if Fiechter’s paragraph 3 fails to disclose the limitations “receive brake wear-related data from a brake-utilization event” and “compare brake wear-related data to data gathered from vehicles for which actual wear measurements were taken to determine a projected brake wear-state,” we agree with the Examiner that paragraphs 33–36 adequately disclose these limitations. Fiechter discloses that “[t]he system operates on the basic assumption that *sensor data* and information from on-board diagnostic systems are collected and monitored,” that “using the available sensor data, [the system] predicts the expected time to failure or a related

measure for each system or component that is monitored (e.g., *brakes . . .*),” and that “[t]he data analysis preventive maintenance approach of the present invention combines classical approaches to diagnostics with a machine learning approach based on data *from many vehicles.*” Fiechter ¶¶ 33–35 (emphasis added). Fiechter also discloses that a condition monitoring system “enables the *continuous* observation of the status of each vehicle while it is operational in order to provide information with respect to the exact environmental and operational conditions *under which the vehicle is being used.*” *Id.* at ¶ 38 (emphasis added). As data is continuously collected from a sensor and the brakes are monitored, Fiechter would necessarily acquire data when the vehicle is braking. Moreover, as Fiechter discloses monitoring the brakes, predicting the expected time to failure of the brakes, and receiving brake wear-related data from when the vehicle is braking, Fiechter would necessarily “compare brake wear-related data to data gathered from vehicles for which actual wear measurements were taken to determine a projected brake wear-state.” *See* Appeal Br. 14, Claims App. As such, Appellants do not provide sufficient evidence or argument apprising us of error.

In summary, and based on the record presented, we are not persuaded the Examiner erred in rejecting independent claim 8 as anticipated by Fietcher. Accordingly, we sustain the Examiner’s rejection of claim 8 as anticipated by Fietcher. We further sustain the Examiner’s rejection of claims 9–11, which fall with claim 8.

Rejection II – Obviousness over Fiechter and Itatsu

Claims 1–20

Appellants do not offer arguments in favor of claims 2–20 separate from those presented for independent claim 1. *See* Appeal Br. 11–12; *see also* Reply Br. 4–5. We select claim 1 as the representative claim, and claims 2–20 stand or fall with claim 1.

To the extent that Fiechter might be regarded as lacking certain disclosure, the Examiner finds that “Itatsu teaches receiv[ing] vehicle-system wear-related data . . . based on a utilization of the vehicle[-]system.” Final Act. 8 (citing Itatsu ¶ 41). The Examiner concludes that it would have been obvious to modify the method of Fiechter “with a means to receive vehicle-system wear-related data . . . based on a utilization of the vehicle system as taught by Itatsu because the substitution of one known element for another would have yielded predictable results.” *Id.* at 9.

Appellants contend that Itatsu “states that ‘time of operation’ (which is operating hours, not a specific time at which a component is used) can be used to ‘estimate wear,’” that “this has nothing to do with gathering wear-related data based on utilization of the system,” and that combining this teaching of Itatsu with Fiechter “solves *none* of the previously identified problems with Fiechter, as there is still no teaching of receiving the wear related data *based on system utilization*, nor is there any teaching of comparing the wear related data to data gathered from other vehicles for which actual wear measurements were taken.” Appeal Br. 11; *see also* Reply Br. 4–5 (Arguing that the claims specify that “wear-related data [is] based on utilization of *the system*”).

Itatsu discloses that “the system **10** calculates the deterioration/wear or remaining useful life” and that “sensors [] may be used for vehicle systems, subsystems and components.” Itatsu ¶¶ 38, 40. Itatsu also discloses “[t]he calculation of wear and remaining useful life by system **10** can be done in different ways depending on the vehicle system, subsystem or component that is being monitored,” “[i]n some of these calculations, a time period is recorded and tracked by system **10** for use by system **10** as further described below, “[f]or example, prior diagnostic data can be compared to present diagnostic data for the same component and degradation of performance,” “[a]lternately, other diagnostic data and vehicle information can be combined and used to estimate the wear and provide a visual graphic **120** for the user to see,” and “[f]or example, the vehicle mileage or time of operation can be used to estimate the wear on the vehicle brakes, fuel and oil/lubrication system components.” *Id.* at ¶ 41 (emphasis added); *see also* Final Act. 8.

The use of time of operation is presented as an example of a manner of estimating the wear on vehicle brakes, and the calculation of wear and remaining useful time of a component can be done in different ways by other diagnostic data and vehicle information that can be combined. *See* Itatsu ¶ 41. As such, Appellants’ contention that Itatsu discloses that the “time of operation” of the brakes is the *only* data that is received “based on utilization of the vehicle-system,” is misplaced. Thus, Appellants do not apprise us of error. Moreover, even if that were the case, Appellants do not exclude time of operation as a “vehicle-related wear data.” *See In re Self*, 671 F.2d at 1348.

We also note that Itatsu is not relied upon to teach comparing the wear related data to data gathered from other vehicles for which actual wear measurements were taken. *See In re Keller*, 642 F.2d 413 (CCPA 1981); *In re Merck & Co.*, 900 F.2d 1091 (Fed. Cir. 1986). Thus, we are not apprised of error based on this argument.

In summary, and based on the record presented, we are not persuaded the Examiner erred in rejecting independent claim 1 as unpatentable over Fietcher and Itatsu. Accordingly, we sustain the Examiner's rejection of claim 1 as unpatentable over Fietcher and Itatsu. We further sustain the Examiner's rejection of claims 2–20, which fall with claim 1.

DECISION

We AFFIRM the decision of the Examiner to reject claims 1–20 as directed to patent-ineligible subject matter.

We AFFIRM the decision of the Examiner to reject claims 1–4, 7–11, and 15–18 as anticipated by Fiechter.

We AFFIRM the decision of the Examiner to reject claims 1–20 as unpatentable over Fiechter and Itatsu.

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

AFFIRMED