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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ABDOLMEHDI KAVEH AHANGAR,
DAVID YELLAMATI, and GARRON K. MORRIS

Appeal 2017-009773
Application 13/489,852[1]
Technology Center 2100

Before CARLA M. KRIVAK, HUNG H. BUI, and JON M. JURGOVAN, *Administrative Patent Judges*.

JURGOVAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek review under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–20, which are all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.[2]

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[1] Appellants identify Rockwell Automation Technologies, Inc. as the real party in interest. (App. Br. 2.)

[2] Our Decision refers to the Specification ("Spec.") filed June 6, 2012, the Final Office Action ("Final Act.") mailed February 10, 2015, the Appeal Brief ("App. Br.") filed October 16, 2015, the Examiner's Answer ("Ans.") mailed April 29, 2016, and the Reply Brief ("Reply Br.") filed October 12, 2016.

CLAIMED INVENTION

The claims are directed to "software, systems, and methods for identifying and presenting reliability information for industrial automation devices and equipment." (Spec. ¶ 1.) Appellants' invention "generate[s] reliability information for [an] industrial automation device based on [a] modified load profile, and present[s] an indication of the reliability information via [a] graphical user interface," where the modified load profile is identified "based on at least a base load profile and . . . at least one operating parameter for the industrial automation device," the at least one operating parameter being selected by a user from the graphical user interface. (Abstract.)

Claims 1 and 11 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A non-transitory computer readable medium having stored thereon program instructions executable by a computing device that, when executed by the computing device, direct the computing device to:
>
> identify a base load profile for an industrial automation device selected for reliability analysis;
>
> present a graphical user interface through which to select operating parameters for performing the reliability analysis with respect to the industrial automation device, wherein the operating parameters comprise an application category;
>
> identify a modified load profile based on at least the base load profile and the operating parameters for the industrial automation device;
>
> generate reliability information for the industrial automation device based on the modified load profile; and
>
> present an indication of the reliability information via the graphical user interface.

(App. Br. 11 (Claims App'x).)

REJECTIONS & REFERENCES

(1) Claims 1, 3, 4, 7, 9, 11, 13, 14, 17, and 19 stand rejected under 35 U.S.C. § 103(a) based on Pitkänen et al. (US 2008/0140322 A1, published June 12, 2008, "Pitkänen") and Mann, III et al. (US 2009/0112368 A1, published Apr. 30, 2009, "Mann"). (Final Act. 3–4.)

(2) Claims 2 and 12 stand rejected under 35 U.S.C. § 103(a) based on Pitkänen, Mann, and Schuster et al. (US 7,313,502 B2, issued Dec. 25, 2007, "Schuster"). (Final Act. 4–5.)

(3) Claims 5, 6, 8, 10, 15, 16, 18, and 20 stand rejected under 35 U.S.C. § 103(a) based on Pitkänen, Mann, and Thiele (US 2010/0204808 A1, published Aug. 12, 2010). (Final Act. 5–6.)

ANALYSIS

Appellants contend Pitkänen and Mann do not teach or suggest "present[ing] a graphical user interface through which to select operating parameters for performing the reliability analysis with respect to the industrial automation device, wherein the operating parameters comprise an application category," as recited in claim 1. (App. Br. 5–7.) Particularly, Appellants argue Mann's selection of aircraft types "fails to teach or suggest an ability to ***select operating parameters for performing reliability analysis*** with respect to an industrial automation device, ***wherein the operating parameters comprise an application category***." (App. Br. 6.) Appellants also assert Pitkänen's "load characteristics are not modified based on operating parameters comprising an application category selected via a graphical user interface." (App. Br. 7.)

We do not find Appellants' arguments persuasive because Appellants are addressing Pitkänen and Mann separately rather than the combination of teachings proposed by the Examiner. In particular, the Examiner finds Pitkänen's system presents a graphical user interface through which to select operating parameters for performing a reliability analysis with respect to an industrial automation device, as claimed. (Final Act. 2 (citing Pitkänen ¶¶ 16, 39–40, 63, 67–68, 71–72, Fig. 2); Ans. 2, 6 (citing Pitkänen ¶¶ 50, 58–61, Figs. 3A–3C).) The Examiner further finds Mann discloses operating parameters comprising an application category. (Final Act. 3–4 (citing Mann ¶¶ 33, 66, Figs. 13, 15, 21); Ans. 6 (citing Mann ¶ 113).) Thus, the Examiner finds the combination of Pitkänen and Mann teaches presenting a graphical user interface through which to select operating parameters for performing the reliability analysis with respect to an industrial automation device, wherein the operating parameters comprise an application category, as recited in claim 1. (Ans. 6.)

As to Appellants' contention that Pitkänen does not teach "operating parameters that may be ***selected through a graphical user interface*** for performing reliability analysis with respect to an industrial automation device" (*see* App. Br. 5), we also agree with the Examiner that Pitkänen teaches a graphical user interface showing operating parameters (e.g., "reeling parameters") that affect performance (such as "fatigue, wear or yield durability" and "load rate or wear rate") of a device in a papermaking machine (an industrial automation device). (*See* Pitkänen ¶¶ 39 (an "[optimum] set of [reeling] parameters is shown, for example, from the user interface, from which the parameters can be downloaded into the system"), 40 (describing "model-based diagnostics observing the quality figures and parameters of reeling" using "user interfaces to present the relative share of the divergence for each signal in the observed set of signals"), 50, 59, 62; Ans. 2, 6.)

As further recognized by the Examiner, Pitkänen's user interface presents operating parameters for determining load characteristics of the papermaking device using "***several load matrixes*** [sic] . . . [of which] ***Fig. 2 shows only one being processed, which necessitates a selection from the several*** [load matrices]" using vectors "***chosen depending on whether the object's fatigue, wear or yield durability is to be measured***," thereby teaching and suggesting operating parameters are selected through the user interface to perform cumulative load analysis for Pitkänen's papermaking device. (Ans. 2 (citing Pitkänen ¶¶ 39, 58–61, Figs. 2, 3A–3C).) Additionally, Pitkänen's load analysis teaches a "reliability analysis with respect to the industrial automation device" as claimed because the analysis of cumulative load levels applied to the papermaking device provides a "probability of failure," "exchange frequency," and "life span forecast for the examined machine part," and "predict[s] the failure interval" of the machine part. (*See* Pitkänen ¶¶ 16, 71–72; *see also* Spec. ¶¶ 4, 20 (describing reliability analyses).)

Thus, Pitkänen teaches "present[ing] a graphical user interface through which to select operating parameters for performing the reliability analysis with respect to the industrial automation device," as claimed. (Ans. 2, 6.)

Appellants also argue Mann's "'types and classes' of airplanes provided for selection in Figure 21 . . . are not ***operating parameters*** that comprise an ***application category***," as recited in claim 1; instead, Mann merely discloses "a menu for selecting between different types of aircraft, namely a T-50 Golden Eagle, F-22 Raptor, F-16 Falcon, and F-15 Eagle," which are "not ***operating parameters*** for performing reliability analysis with respect to an industrial automation device, nor are they suggestive of an ***application category*** being one of those operating parameters." (App. Br. 6.)

Appellants' argument is unpersuasive because Mann's selectable types and classes of airplanes are commensurate with the broad description of "operating parameters" comprising "an application category" in Appellants' Specification. In particular, Appellants' Specification describes:

> *Operating parameters* included in parameters 120 *can include any environmental or operational parameter for an industrial automation device or associated controller devices. Examples include* industry, *application within an industry*, duty factors, . . . power cycles, . . . temperature, . . . and power quality, among other parameters, including combinations or variations thereof. Typically, *different applications* and industries *operate these industrial automation devices under different operating conditions and stresses, such as ambient temperature, overloads, shock loads*, and flying starts, among other stresses.
> . . .
> *Different applications* and industries *employ industrial device 331 under different operating and environmental conditions* . . . . *The application typically indicates the specific type of function or process used by the industrial automation equipment. Example applications include* belt conveyors, chain conveyors, diverters, palletizers, centrifugal fans/pumps, cooling/baking conveyors, positive displacement compressors, hoists, cranes, auger conveyors, ball mills, rotary kilns, induced draft fans, beater type mixers, crushers/pulverizers, extruders, blown film, injection molding, blow molding, screw compressors, center driven winders, sugar centrifuges, punch presses, textile machines, engine/transmission test stands, recirculation fans, compressors, chippers, mixers, flow/pumps,

> converting, and web handling, including combinations thereof.
> . . .
> *Application* and industry selections are presented in pull-down selection elements . . . .

(Spec. ¶¶ 31, 38, 41 (emphases added).) Thus, Appellants' Specification broadly describes "application categories" as (1) indicators of "different operating conditions" required by or recommended for different industrial automation devices, and (2) indicators of a "specific type of function or process used by the industrial automation equipment." (*See* Spec. ¶¶ 31, 38.)

We, therefore, agree with the Examiner that Mann's types and classes of airplanes teach the claimed "operating parameters" comprising an "application category" (type/class of airplane). (Ans. 3, 6.) Airplanes' type and class indicate different operating conditions required or recommended for an industrial automation equipment (avionics system requiring air conditioning and cooling) of different airplane types. (Ans. 3, 6; *see also* Mann ¶¶ 6–8, 45.) For example, Mann's airplane type/class indicates "operating parameters . . . appropriate to the output temperatures and pressures (and electrical power) required by any given airplane" and "the pressure setpoint Psp value as well as other temperature setpoint Tsp values . . . to customize the air conditioner . . . to the specific needs and requirements of differing types and classes of airplanes." (*See* Mann ¶¶ 66, 113; Ans. 3, 6.)

Appellants next argue Pitkänen does not teach or suggest "*identifying a modified load profile based on at least the base load profile and the operating parameters for the industrial automation device*," as recited in claim 1. (App. Br. 7; *see also* Reply Br. 2–3.) We do not find Appellants' arguments persuasive. Rather, we agree with the Examiner that Pitkänen discloses "updating (i.e.; modifying) of an existing/previous (i.e.; base) load profile to form (i.e.; identify/create) a modified load profile, such updating being based upon continuously measured load information." (Ans. 6 (citing Pitkänen ¶¶ 39, 71–72).) That is, Pitkänen determines load characteristics (load levels applied to the papermaking device, *see* ¶ 69) based on operating parameters "chosen depending on whether the object's fatigue, wear or yield durability is to be measured" (*see* ¶¶ 59, 61) and "updat[es], preferably constantly, . . . the operational reliability model . . . by [the] load characteristics" (*see* ¶ 72), thereby teaching a modified load profile (updated operational reliability model) is based on a base load profile (initial operational reliability model created from first-time/oldest testing data of the papermaking device, *see* ¶¶ 29, 37, 71) and the chosen operating parameters, as required by claim 1. (Ans. 2–3, 6.)

Appellants argue Pitkänen's "updating a reliability model by load characteristics determined in real time is not equivalent" to the claimed identifying. (App. Br. 7.) This argument is, however, not commensurate with the scope of claim 1, which does not preclude real time measurements from identifying the claimed modified load profile.

Appellants also argue Pitkänen does not teach a base load profile or a modified load profile, and "none of [the criticalness analysis program, the operational reliability model, or the operational reliability system] components is a load profile." (Reply Br. 2.) Appellants' argument is not persuasive because Appellants' Specification does not provide an explicit and exclusive definition of the claimed term "load profile"; rather, the Specification merely provides discussion of non-limiting examples of "base" and "modified load profiles." (*See* Spec. ¶¶ 18–19.) We agree with the Examiner that Pitkänen's updated operational reliability model and initial operational reliability model are commensurate with the broad description of "modified" and "base load profiles" in Appellants' Specification. (Ans. 2, 6.)

For these reasons, we sustain the Examiner's rejection of independent claim 1 and the Examiner's rejection of independent claim 11 on the same basis as claim 1 (*see* App. Br. 7).

No separate arguments are presented for dependent claims 2–6, 8–10, 12–16, and 18–20. (*See* App. Br. 7, 9.) Accordingly, for the reasons stated with respect to independent claims 1 and 11, we sustain the rejection of these dependent claims. *See* 37 C.F.R. § 41.37(c)(l)(iv).

Claims 7 and 17

With respect to dependent claims 7 and 17, Appellants contend Pitkänen's "display of the monitored load characteristics in a graphical user interface" does not disclose "a ***reliability curve to indicate the reliability information***" or a reliability curve "***determined based on a base reliability curve modified by the modified load profile***," as claimed. (App. Br. 8; Reply Br. 3.)

Appellants' argument is unpersuasive because Pitkänen's cumulative load accrual curve illustrated in Figure 3A is commensurate with the broad description of a "reliability curve" indicating "reliability information" in Appellants' Specification. In particular, Appellants' Specification provides that a "reliability curve" is "a graphical representation of reliability" such as "a two-dimensional graph which plots a relationship between time and reliability" and "multi-dimensional graphs which plot other reliability information against time or operating conditions." (*See* Spec. ¶¶ 20–21.) Pitkänen's curve illustrated in Figure 3A plots "a cumulative load accrual characteristic . . . as a function of time," the cumulative load accrual characteristic indicating "how great a totaled load has been directed at the measured object during the time when load measurement data has been collected on the measured object," thereby indicating reliability information. (*See* Pitkänen ¶ 66.) As discussed *supra* with respect to claim 1, cumulative load levels applied to Pitkänen's papermaking device indicate a "probability of failure," "exchange frequency," and "life span forecast for the examined machine part," and "predict the failure interval" of the machine part. (*See* Pitkänen ¶¶ 16, 71–72; Ans. 4, 6.)

We are also not persuaded by Appellants' arguments that Pitkänen's curve does not teach or suggest "a reliability curve ***determined based on a base reliability curve modified by the modified load profile***," as required by claim 7. (App. Br. 8.) The oldest-measured load accrual characteristic vs time in Pitkänen's Figure 3A—for example, the load characteristic for the oldest date on Figure 3A's horizontal axis—is commensurate with the broadly claimed "base reliability curve," which term lacks an explicit definition in Appellants' Specification. (*See* Spec. ¶¶ 24, 58.) Thus, we agree with the Examiner that Pitkänen's Figure 3A discloses a reliability curve determined based on a base reliability curve modified by the modified load profile—that is, modified by the most recently-measured load characteristics of the updated operational reliability model. (*See* Pitkänen ¶ 72, Fig. 3A; Ans. 4, 6.)

In light of the above, we sustain the Examiner's rejection of claims 7 and 17.

DECISION

We affirm the Examiner's decision rejecting claims 1–20 under 35 U.S.C. § 103(a).

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