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EXAMINER	
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BERND-MARKUS PFEIFFER

Appeal 2015-004888
Application 13/252,633
Technology Center 2100

Before JASON V. MORGAN, NABEEL U. KHAN, and KAMRAN JIVANI, *Administrative Patent Judges*.

KHAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Final Rejection of claims 1–9. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

[1] According to Appellant, the real party in interest is Siemens AG. App. Br. 2.

THE INVENTION

Appellant's invention relates to:

> A method for designing a process controller for a process variable comprising a pressure or a flow rate [and] connectable upstream in a closed control loop of a controlled system having a positioning drive, where the closed control loop is simulated to determine the performance of the process controller.

Spec., Abstr. Representative claim 1 is reproduced below. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2013) (representative claims).

> 1. A method for designing a process controller for a process variable comprising a pressure or a flow rate which is connectable upstream in a closed control loop of a controlled system having a positioning drive, the method comprising:
>
> simulating, by a processor of a computer, the closed control loop in relation to a simulated profile of one of an actual value of the process variable, a desired value and a system deviation to determine a performance of the process controller;
>
> adding, by the processor of the computer, a predetermined noise value corresponding to fluctuations in an actual value of the process variable at a constant desired value and a terminated initial response to the simulated profile of the actual value of the process variable; and
>
> evaluating a simulated profile of a manipulated variable of the process controller to determine an estimate of an energy consumption of the positioning drive.

REFERENCES and REJECTIONS

The Examiner rejects claims 1–9 under 35 U.S.C. § 103(a) as obvious over Pyötsiä (US 5,992,229; iss. Nov. 30, 1999) and Ke (J. Ke et al., *Energy Efficiency Analysis and Optimal Control of Servo Pneumatic Cylinders*, 2005 IEEE International Conference on Control Applications, 541–46 (2005) (Aug. 28–31, Toronto, Canada). Final Act. 2–5 (mailed Dec. 24, 2013).

ANALYSIS

Claim 1 recites "adding . . . a predetermined noise value[,] corresponding to fluctuations in an actual value of the process variable at a constant desired value and a terminated initial response[,] to the simulated profile of the actual value of the process variable." The Examiner finds Pyötsiä's disturbance, as added to Figure 4's process at the second disturbance input 6', teaches claim 1's predetermined noise value as follows:

> [Pyötsiä] *(*[*Pyötsiä*]*: Figure 4)* clearly shows disturbance (i.e.[,] noise) being added to the closed loop system containing process controller. [Pyötsiä] *(*[*Pyötsiä*]*: column 5*[,] *lines 17-20)* discloses that the disturbance and noise can be set by the operator of the system. This is a clear manifestation of a predetermined noise[—]because operator determines the noise or disturbance level to be injected into the system to evaluate the system performance. This is further elaborated in [Pyötsiä] *(*[*Pyötsiä*] *: column 5*[,] *lines 54-59)* wherein it states that to use or add certain general disturbance characteristic to the control loop as a standard test disturbance[.]

Ans. 3–4; *see also* Final Act. 2–3.

Appellant argues that Pyötsiä's disturbance is not predetermined because: "*Pyötsiä* merely explains that it is possible for an operator to set the disturbance and noise of measured signals, but there is no description in this section of *Pyötsiä* regarding the precise type of disturbance or noise that is set." Reply Br. 2; *see also* App. Br. 5–7. And, Appellant further argues:

> [In Appellant's invention,] the response of a controller to a known noise value is determined. That the noise value is known (i.e., predetermined) can only mean that it was acquired before the simulation was/is performed[.]
>
> *Pyötsiä*, on the other hand, describes a testing system that evaluates loop performance with the use of real time values obtain from an actual, i.e., real process. *Pyötsiä* fails to teach that a predetermined noise value is obtained.

Reply Br. 4.

We are not persuaded by Appellant's arguments. We find that, under a broadest reasonable interpretation, claim 1's predetermined noise value encompasses Pyötsiä's disturbance. We agree with the Examiner's finding that Pyötsiä's disturbance is "predetermined" insofar as being a standard test disturbance set by the operator to evaluate system performance. Ans. 3–4 (citing Pyötsiä col. 5, ll. 17–20; col. 5, ll. 54–59). As such, Pyötsiä's disturbance is plainly chosen according to a predetermined evaluation plan; e.g., as a standard test value of the applied process model. *Accord* Pyötsiä col. 3, ll. 53–56; col. 5, ll. 15–20, 54–69. Moreover, Pyötsiä's confirms the disturbance can be chosen in the same manner as Appellant's predetermined noise; namely measured from a real system. Pyötsiä col. 5, ll. 54–59; claim 5; *see also* Final Act. 3–4 ("[*Pyötsiä's*] *noise and disturbances*[,] *i.e.*[,] *nonlinearities of the process that are taken into account in the simulation* *model are measured from real control loop*" (citing Pyötsiä, col. 2, ll. 3–15). Thus, Appellant's argument fails to show that Pyötsiä's disturbance is not a predetermined noise value.

Appellant further argues "*Pyötsiä* teaches that the position of the valve is measured, but this does not mean that a process variable, i.e., the pressure or flow rate, within the meaning and scope of the independent claim 1 is acquired." App. Br. 6; *see also* Reply Br. 5. We are unpersuaded by Pyötsiä's process output/feedback Y and added disturbance 6′ (Fig. 4) teach a variable comprising flow rate. For example, Pyötsiä simulates the closed control loop by modeling, in part, flow equations of the valve and disturbances of the process. Pyötsiä Abstr., col. 3, ll. 21–24. Pyötsiä explains that "[t]he inherent flow characteristics of the valve and the pipeline behaviour are also modelled in the system," (Pyötsiä col. 5, ll. 12–14) and that "[t]here are different unit process models, such as tank level loops, flow control loops, pressure control loops . . . in a model library" (Pyötsiä col. 5, ll. 15–17). Pyötsiä also measures the valve's responsiveness to determine process variability; namely, unwanted variability of the process output. *Id.* Fig. 7A. A skilled artisan would infer that the simulation translates all of the above—which expressly includes a modeled valve flow and modeled pipeline behavior—to a process output representing a flow and its variability. *See id.* at col. 1, l. 53–col. 2, l. 9, col. 5, ll. 12–17, Figs. 4, 7A.

For the foregoing reasons, Appellant has not shown an error in the Examiner's findings for representative claim 1. Accordingly, we sustain the Examiner's rejection of claim 1 together with the rejection of claims 2–9.

DECISION

The Examiner's rejection of claims 1–9 is affirmed.

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

AFFIRMED