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EXAMINER
SAXENA, AKASH

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FRANCISCO MATURANA and KENWOOD HALL

Appeal 2018-008475
Application 13/692,884
Technology Center 2100

Before BETH Z. SHAW, CARL L. SILVERMAN, and
SCOTT B. HOWARD, *Administrative Patent Judges.*

SHAW, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1, 4–7, and 9–20, which constitute all the claims pending in this application. *See* Final Act. 1. Claims 2, 3, and 8 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

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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 Rockwell Automation Technologies, Inc. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claims are directed to simulation of industrial automation systems. Claims 1 and 14, reproduced below, are illustrative of the claimed subject matter, with certain disputed limitations in italics:

> 1. A computer apparatus comprising software that when executed by the computer apparatus directs the apparatus to simulate operation of an industrial system, the apparatus comprising:
>
> simulation configuration software, that when executed by the computer apparatus directs the apparatus to create a simulation of an industrial control system, and a simulation executable file, wherein the simulation configuration software comprises an industrial module modeler software configured to model at least inputs and outputs of one or more physical industrial control modules for the simulation and create communication links between the one or more modeled industrial control modules and corresponding ones of the one or more physical industrial control modules *to synchronize the inputs and outputs of the one or more modeled industrial control modules with inputs and outputs of corresponding ones of the one or more physical industrial control modules during the simulation*;
>
> simulation execution software that when executed by the computer apparatus directs the apparatus to receive the simulation executable file from the simulation creation software, and execute the simulation executable file to run a simulation;
>
> communication software that when executed by the computer apparatus directs the apparatus to communicate with the simulation execution software and to further communicate
>
> with at least one industrial control module; and
>
> a non-transitory computer readable storage medium having the user simulation configuration software, the simulation execution software, and the communication software stored thereon.

14. A method for creating a simulation of an industrial automation system comprising:

creating a simulation of an industrial control system at least in part using a simulation creation module on a computer;

modeling at least inputs and outputs of industrial modules at least in part using the simulation creation module on a computer;

creating communication channels between the modeled industrial control module and a physical industrial control module at least in part using a simulation execution module; and

synchronizing the timing between inputs and outputs of the one or more physical industrial control modules of the simulation and inputs and outputs of the physical industrial control module at least in part using the simulation execution module.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Schaefer	US 2005/0193056 A1	Sept. 1, 2005
Nasle	US 2008/0077368 A1	Mar. 27, 2008
Hansen	US 2008/0177396 A1	July 24, 2008
Sturrock	US 2009/0089234 A1	Apr. 2, 2009

REJECTIONS

Claim 1, 5–6, and 9–10 are rejected under pre–AIA 35 U.S.C. § 102(b) as being anticipated by Sturrock. Final Act. 7.

Claims 4, 9–10, and 13–20 are rejected under pre–AIA 35 U.S.C. § 103(a) as being unpatentable over Sturrock and Nasle. Final Act. 14.

Claim 11 is rejected under pre–AIA 35 U.S.C. § 103(a) as being unpatentable over Sturrock, Nasle, and Schaefer. Final Act. 18.[2]

Claims 7 and 12 are rejected under pre–AIA 35 U.S.C. § 103(a) as being unpatentable over Sturrock and Hansen. Final Act. 20.

OPINION

Claim 1

The Examiner rejects claim 1 as anticipated by Sturrock under 35 U.S.C. § 102.

> [U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIn, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008).

> Thus, it is not enough that the prior art reference discloses part of the claimed invention, which an ordinary artisan might supplement to make the whole, or that it includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention.

Id.

The Examiner concludes that "during the simulation," as recited in claim 1, is understood to mean "as long as the simulation component is

[2] We note there appear to be some discrepancies, cumulative rejections, or typographical errors in the various listing of rejections in the Final Rejection. *See* Final Act. 2, 7, and 14. We present the rejections as we understand them from the record.

operated on (as *no bounds* of 'during' is specified)." Ans. 6 (emphasis added). The interpretation of "during" as having no bounds (*id.*) is, however, unreasonably broad, in light of the Specification. We also see no evidence in the record that a "during" is without bounds. Indeed, Sturrock also uses the term "during" in paragraph 27 and states: "If a problem occurs during simulation or the simulation fails, the simulation component 130 identifies the particular simulation models that were the root of the failure."

Although the Examiner is correct that the term "during" is not explicitly defined (Ans. 6), "[t]he correct inquiry in giving a claim term its broadest reasonable interpretation in light of the specification is not whether the specification proscribes or precludes some broad reading of the claim term adopted by the examiner." *In re Smith Int'l, Inc.*, 871 F.3d 1375, 1382–83 (Fed. Cir. 2017). Rather, "[i]t is an interpretation that corresponds with what and how the inventor describes his invention in the specification, i.e., an interpretation that is 'consistent with the specification.'" *Id.* at 1383 (internal citations omitted).

The claim recites synchronizing the inputs and outputs of the one or more modeled industrial control modules with inputs and outputs of corresponding ones of the one or more physical industrial control modules "during the simulation." The Examiner finds paragraph 61 as well as Figures 7, 8, and 11 of Sturrock disclose this limitation. Ans. 5. Yet, paragraph 61 of Sturrock describes that a monitor component 860 stores the actual activity and associates the activity with simulation *results*. Sturrock 61. The artificial intelligence component 870 can then calculate a comparison between actual values and simulated results, and re-calculate a new version of the simulation model to compensate for any difference. *Id*. Thus, Sturrock's

creation of a new simulation model after simulation results are received does not disclose synchronizing the original simulation model "during the simulation."

Accordingly, we do not sustain the rejection of independent claim 1 as anticipated by Sturrock. For the same reasons, do not sustain the rejection of independent claim 6, or dependent claims 5, or 8–10. We also do not sustain the rejections of dependent claims 4, 7, or 9–12 under 35 U.S.C. § 103, because the Examiner does not assert that either Nasle, Shaefer, or Hansen cure the above-noted deficiencies of Sturrock.

Claim 14

Appellant argues Nasle fails to teach "synchronizing the timing between inputs and outputs of the one or more physical industrial control modules of the simulation and inputs and outputs of the physical industrial control module at least in part using the simulation execution module," as recited in independent claim 14. Yet, as the Examiner finds, Nasle teaches in paragraph 66 that output values from the model and sensor are calibrated and synchronized in time. Ans. 7–8. In particular, Nasle teaches that "the virtual system model is periodically calibrated and synchronized with 'real-time' sensor data outputs so that the virtual system model provides data output values that are consistent with the actual 'realtime' values received from the sensor output signals." Nasle ¶ 66. In the absence of sufficient evidence or line of technical reasoning to the contrary,[3] we agree with the

[3] Appellant did not address the evidence cited in the Examiner's Answer. *Compare* Ans. 7–8 (citing Nasle ¶¶ 61, 66); *with* Reply Br. (not discussing Nasle).

Examiner's findings and we find no reversible error in the rejection of claim 14.

Accordingly, we sustain the rejection of claim 14 under 35 U.S.C. § 103, as well as dependent claims 15–20, for which Appellant presents no additional arguments.

CONCLUSION

We reverse the rejection of claims 1, 5, 6, and 8–10 under 35 U.S.C. § 102(b).

We reverse the various rejections of claims 4–7, and 9–13 under 35 U.S.C. § 103, as outlined below in the Decision Summary.

We affirm the rejection of claims 14–20 under 35 U.S.C. § 103.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 5, 6, 8–10	102	Sturrock		1, 5, 6, 8–10
4, 9, 10, and 13–20	103	Sturrock, Nasle	14–20	4, 9, 10
11	103	Sturrock, Nasle, Schaefer		11
7, 12	103	Sturrock, Hansen		7, 12
Overall Outcome:			14–20	1, 4–7, 9–13

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 IN PART