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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte STEFAN MATAN, FRED C. HORTON,
and FRANK P. MARRONE

Appeal 2019-006381
Application 14/791,429
Technology Center 2800

Before BEVERLY A. FRANKLIN, JEFFREY B. ROBERTSON, and
MICHAEL G. McMANUS, *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ seeks review of the Examiner’s decision to reject claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

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 Xsient Energy Technologies, LLC. Appeal Brief dated May 16, 2019 (“Appeal Br.”) 2.

CLAIMED SUBJECT MATTER

The present application generally relates to distributed and hierarchical control within an electrical power grid. Specification filed July 4, 2015 (“Spec.”) ¶4. The Specification teaches that traditional utility power grids include a centralized power source (such as, for example, a coal-powered generator) and centralized management. *Id.* ¶6.

The Specification teaches that power delivered by the grid generally consists of a real power component and a reactive power component. With real power, the voltage waveform and current waveform are perfectly aligned in-phase while, with reactive power, the voltage waveform and current waveform are not phase-aligned. *Id.* ¶8.

The Specification further teaches that there has been a significant increase in grid consumers adding renewable sources locally to produce power. *Id.* ¶10. This can lead to real power pushed back from the customer premises toward the central management and the central power source which can create issues of grid voltage control and reactive power instability on the grid. *Id.*

The Specification describes an embodiment (depicted in Figure 4) where the ratio of reactive to real power output is modified as follows:

[N]ode 432 can communicate downstream to cause control nodes 454 ***to change a ratio of reactive to real power output*** upstream. In one embodiment, node 432 adjusts real and/or reactive power generation and/or demand at PCC 422 to adjust the electrical conditions as seen upstream from PCC 422. In one embodiment, node 432 and/or node(s) 454 adjust operation to divert at least a portion of real and/or reactive power to energy store 444.

Spec. ¶ 85.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below with certain limitations bolded for emphasis:

1. A method for controlling a power grid, comprising:

monitoring power generation of a local power generation device and power demand of local loads at a point of common coupling (PCC) to a utility power grid as seen at the PCC when looking from a consumer side of the PCC, wherein the monitoring is performed by a control node on the consumer side of the PCC electrically across the PCC from central grid management, the consumer side being a same side of the PCC as the power generation and power demand; and

adjusting an operation of a power converter on the consumer side that controls a flow of power between the PCC and the **local power generation device** and the local loads in response to the monitoring by the control node and a control signal from the control node, **to change a ratio of real and reactive power of the flow of power** at the PCC as seen from the consumer side of the PCC and change an electrical characteristic as seen at the PCC from a grid side of the PCC, to maintain compliance with grid regulations as seen at the PCC from the grid side.

Appeal Br. 10 (Claims App.).

REFERENCES

The Examiner relies upon the following prior art:

Name	Reference	Date
Miller et al. (“Miller”)	US 2008/0106098 A1	May 8, 2008
Cherian et al. (“Cherian”)	US 2012/0029720 A1	Feb. 2, 2012
Ansari et al. (“Ansari”)	US 2014/0121849 A1	May 1, 2014

DISCUSSION

Rejection

The Examiner rejects claims 1–20 as obvious over Ansari in view of Miller. Final Office Action, dated Oct. 22, 2018 (“Final Act.”) 2–10. In support of the rejection, the Examiner finds that Ansari teaches all limitations other than changing a ratio of real and reactive power of the flow of power at the PCC as seen from the consumer side. Final Act. 3. The Examiner further finds that Miller teaches to control a ratio of real and reactive power of a local power generation device connected to a power grid. *Id.* (citing Miller Fig. 2, ¶ 29). The Examiner determines that one of skill in the art would have had reason “to control the ratio of real and reactive power in the household configuration of Ansari because such a modification would have been merely implementing a well-known power flow control technique that would yield predictable results in the method of Ansari.” *Id.*

Argument

Appellant argues that the rejection of the independent claims (claims 1, 11, and 16) should be reversed. Appeal Br. 5–9. The Appellant designates claim 1 as representative. *Id.* at 5.

Appellant argues that Miller teaches a “commercial generator” and that “that the technique for power flow control in a commercial, AC power wind turbine generator is not implementable in the household solar system of Ansari.” *Id.* at 6. Appellant asserts that there are numerous technical differences between solar systems and wind turbine systems. *Id.* Accordingly, Appellant argues that a person of ordinary skill in the art would not have had reason to combine the teachings of Ansari and Miller.

Appellant additionally argues that, for the reasons discussed above, such a combination would not yield predictable results. *Id.* at 6–7. Appellant further asserts that “[t]he generator (generator 24) and the frequency converter (converter 36) [of Miller] are not the same as the power converter of Applicant’s claimed invention, and are not the same as the power converter disclosed in Ansari.” *Id.* at 6.

Appellant similarly argues that solar systems traditionally only produce real power and, therefore, the principle of operation of a wind farm based on AC power from wind turbines, which produce real and reactive power, cannot be applied to Ansari’s solar system. *Id.* at 7.

In the Answer, the Examiner asserts that most of Appellant’s arguments are predicated on the notion that one would not combine the *solar* power generation technology of Ansari with the *wind* power generation technology of Miller. Examiner’s Answer, dated June 27, 2019 (“Ans.”), at 3. The Examiner finds this unpersuasive because Ansari teaches both wind power and solar power generation systems. *Id.* The Examiner additionally finds that, even if Ansari did not teach the use of wind power, it is nonetheless well-known to operate renewable energy control systems with power generated from both wind and solar sources. *Id.* at 3–4.

The Examiner cites to an additional reference, Cherian, as teaching to control active and reactive power flow in a solar power or a wind power generation system. *Id.* at 5. The Examiner quotes Cherian as stating “[t]he smart grid controls 285 include capabilities such as active and reactive power flow control.” *Id.*

Appellant presents certain arguments in its Reply Brief. *See* Reply Brief dated Aug. 27, 2019 (“Reply Br.”). Appellant argues that the

Examiner has issued a new rejection by combining Cherian with the previously cited references. *Id.* at 2.

Appellant further argues that “a residential renewable energy system (solar or wind) requires an inverter to grid-connect the system.” Reply Br. 2. Appellant further asserts that “[u]ntil Appellant’s invention, there [were] no residential inverters that [could] simulate the operation of a traditional spinning generator.” *Id.* at 2. Appellant further asserts that traditional inverters for residential systems output only real power, not reactive power. *Id.* at 3. Appellant further asserts that some residential systems include filters to load the grid to change the net reactive energy but that “[m]anipulation of the pure real power output with a filter is not the claimed adjusting of the operation of a power converter to change the ratio of real and reactive power.” *Id.*

Analysis

Appellant’s arguments set forth in its principal brief are unpersuasive because, as noted by the Examiner, they are predicated on the notion that the teachings of Ansari are limited to residential solar power generation. Ansari, however, teaches a system where residential power generation may be by solar or wind power. Ansari ¶ 24.

In its Reply Brief, Appellant objects to the use of the Cherian reference. An Examiner may include a new ground of rejection in the Answer. 37 C.F.R. § 41.39(a)(2). Any such new ground, however, “shall be designated by the primary examiner as a new ground of rejection. *Id.* Where an Answer includes a new ground that has not been properly designated, the Appellant may seek review of the failure to designate a

ground as a new ground of rejection by filing a petition to the Director. 37 C.F.R. § 41.40(a). “Failure of appellant to timely file such a petition will constitute a waiver of any arguments that a rejection must be designated as a new ground of rejection.” *Id.*

Here, there is no indication in the record that Appellant timely petitioned for relief on this basis. Accordingly, this issue is waived.

Also in its Reply Brief, Appellant presents arguments that the references fail to teach a residential inverter that adjusts an operation of a power converter to change a ratio of real and reactive power of the flow of power at the PCC.

These arguments depend upon unsupported factual assertions. For example, Appellant asserts that a residential power source requires an inverter to connect to the electrical grid. Reply Br. 2. Appellant, however, does not offer factual support for such statement. Appellant further asserts that traditional inverters for residential systems output only real power. *Id.* at 3. Again, Appellant does not offer factual support. Appellant further makes an assertion regarding the scope of the claimed “adjusting an operation of a power converter” that is unsupported by argument or citation to evidence of record. In view of the foregoing, we do not find that Appellant has shown harmful error with regard to the rejection of the independent claims. *See In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996) (arguments of counsel cannot take the place of factually supported objective evidence.).

Claim 5

Appellant additionally argues that the rejection of claim 5 is in error. Appeal Br. 8. Claim 5 depends from claim 1 and further requires that “the PCC includes at least one additional PCC downstream from the central grid management.” *Id.* at 10 (Claims App.). In the Final Office Action, the Examiner cites to the “neighborhood configuration” of Ansari’s Figure 3. In the Answer, the Examiner finds that “the point of common coupling (PCC) in Ansari is found at the smart meter 110 and the corresponding connection point on utility pole 114 shown in figure 1.” Ans. 9. The Examiner further finds that “[t]here is then a PCC at each of the households in figure 3” and “[t]he central grid management in Ansari is the utility control center 350 in figure 3.” *Id.* The Examiner determines that “because each household has its own PCC, there are multiple PCC’s downstream of the central grid management 350.” *Id.* Appellant does not respond to these findings in its Reply Brief.

As Appellant has not shown error in the Examiner’s findings described above, we determine that there is insufficient basis for reversal of the rejection of claim 5.

Claim 8

Appellant additionally argues that the rejection of claim 8 is in error. Appeal Br. 8. Claim 8 depends from claim 7 which depends, in turn, from claim 1. *Id.* at 11 (Claims App.). Claim 7 requires that “adjusting the

interface² comprises adjusting a phase offset of reactive power at the PCC with a power converter of the control node.” *Id.* Claim 8 further requires that “adjusting the phase offset of the reactive power comprises changing an amount of reactive power output via the PCC to the grid from power generation resources on the consumer side of the PCC.” *Id.*

Appellant argues that the Examiner does not adequately show a teaching of these features in the rejection and that “[n]either Miller nor Ansari disclose or suggest the claimed generation of reactive power from local power generation resources.” *Id.* at 8–9.

In response, the Examiner briefly asserts that “Para. [0029] and figures 2-3 of Miller teach generating reactive power from a local power generation resource (wind turbine).” *Ans.* at 9.

The Examiner’s response is insufficient because it does not specifically address “adjusting the phase offset” as claimed. Accordingly, Appellant has shown error in this regard.

CONCLUSION

For the reasons set forth in the Final Office Action, the Examiner’s Answer, and above, the Examiner’s rejection of claims 1–7 and 9–20 is affirmed. The Examiner’s rejection of claim 8 is reversed.

² The Panel notes that current claim 1 does not require “adjusting the interface.” Appeal Br. 10 (Claims App.).

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-20	103	Ansari, Miller, Cherian	1-7, 9-20	8

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-IN-PART