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CORNING INCORPORATED
INTELLECTUAL PROPERTY DEPARTMENT, SP-TI-3-1
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JOHNSON, RYAN

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AMI HAZANI, GUY LUPESCU, and OFER NISAN

Appeal 2019-006510
Application 15/049,621
Technology Center 2800

Before CATHERINE Q. TIMM, N. WHITNEY WILSON, and MERRELL C. CASHION, JR., *Administrative Patent Judges.*

TIMM, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–20. *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We use the term "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Corning Optical Communications LLC, which is a wholly owned subsidiary of Corning Incorporated. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to a remote unit for use in a distributed communication system (*see, e g.*, claim 1), a method of managing power in a remote unit (*see, e.g.*, claim 13), and a distributed communication system containing the remote unit (*see, e.g.*, claim 20). The remote unit includes an antenna, a power input, a power over Ethernet integrated circuit (POE IC), and a control system. Claims 1 and 20. In the distributed communication system, the remote units are distributed, for instance, in a building to provide wireless access points. Spec. ¶ 35; Fig. 2A (remote unit (RU) 14).

At the heart of the dispute in this appeal is the control system and a calculation performed by the control system. *Compare* Appeal Br. 7–10, *with* Ans. 3–7. The control system measures voltage and current associated with two load resistances and calculates an available power for the remote unit. Claims 1 and 20. Claim 13 requires a step of "calculating an available power for the remote unit based on the first current, the first voltage, the second current, and the second voltage." Claim 1, reproduced below with emphasis on the key limitation, is illustrative of the claimed subject matter:

> 1. A remote unit for use in a distributed communication system, comprising:
>
> at least one antenna configured to transmit radio frequency signals into a coverage area;
>
> a power input configured to receive a power signal from a power distribution module through a power medium;
>
> a power over Ethernet integrated circuit (POE IC) configured to measure voltage and current from the power input; and
>
> *a control system configured to*:

open a services switch between the power input and a real load;

instruct the POE IC to close a first switch coupling a first load resistance to the power input;

instruct the POE IC to measure a first voltage and a first current associated with the first load resistance;

instruct the POE IC to open the first switch and close a second switch coupling a second load resistance to the power input;

instruct the POE IC to measure a second voltage and a second current associated with the second load resistance; and

calculate an available power for the remote unit.

Appeal Br. 6 (emphasis added).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Admon	US 7,417,443 B2	Aug. 26, 2008
Hunter	US 2012/0317426 A1	Dec. 13, 2012

REJECTIONS

Claims 1–20 are rejected under 35 U.S.C. § 103 as being unpatentable over Hunter in view of Admon. Final Act. 5.

Claims 13–19 are rejected under 35 U.S.C. § 103 as being unpatentable over Admon in view of Hunter. Final Act. 12.

OPINION

Rejection of claims 1–20 over Hunter in view of Admon

To review the rejection of claims 1–20 as obvious over Hunter in view of Admon, we will focus on the independent apparatus claims (claims 1 and 20) and the independent method claim (claim 13). Claims 1 and 20, and thus all of the apparatus claims, require a remote unit including a control system configured to open a services switch, instruct a POE IC to manipulate switches coupling load resistances to the power input and measure first and second currents and respective voltages associated with the load resistances, and "calculate an available power for the remote unit." *See, e.g.*, claims 1 and 20. The method claims require "calculating an available power for the remote unit" based on first and second currents, and first and second voltages. *See, e.g.*, claim 13.

The Examiner finds that Hunter teaches both (1) a control system configured to calculate an available power for the remote unit and (2) the method step of calculating an available power for the remote unit based on measured voltage and current. Final Act. 6–7. Appellant contends Hunter teaches neither. Appeal Br. 7–9. We agree with Appellant that a preponderance of the evidence fails to support the Examiner's findings with regard to the control system configuration and method step.

First, we consider the meaning of "available power for the remote unit." This phrase must be interpreted in a way that is consistent with the Specification. *See In re Smith Int'l, Inc*., 871 F.3d 1375, 1382–83 (Fed. Cir. 2017) ("The 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. And it is not simply an interpretation that is not inconsistent with

the specification. It 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.'" (quoting *Morris*, 127 F.3d at 1054)).

Looking to the Specification, we determine that "available power for the remote unit" refers to the power available at the ports of the remote unit RU. Spec. ¶ 59 (referring to ports 158, 160 shown in Figure 5 that deliver power to remote unit 102). Appellant calculates this power as $P_{in}=I*V_{out} - I^2*R_{LINE}$. Spec. ¶ 60 (Eq. 3); Fig. 5. In other words, the "available power for the remote unit" equals the power supplied by power supply 130 minus power lost by the wires carrying the power to the remote unit. *See* Spec. ¶ 9 ("Even when the remote power source is initially adequate to supply sufficient power to the RUs, some of the power is lost on the wires carrying the power."). Thus, the "available power for the remote unit" must be taken to refer to the power available at the ports of the remote unit, a value different from the power output from the power supply because of the loss of power over the wires (electrical medium 110) carrying the power to the remote unit (RU).

Hunter teaches a system and method for delivering power to a remote unit (PD 106). Hunter ¶¶ 31–32. Power source equipment (PSE 102) delivers power through Ethernet cables (communication channel 104) to PD input port 142. Hunter ¶¶ 31–32, 38; Fig 2. In order to meet the requirements of the claims, Hunter must teach calculating an available power at PD input port 142.

The Examiner has not adequately established that Hunter calculates an available power at PD input port 142. As found by the Examiner, Hunter's remote unit (PD 106) includes a computing device 164 that determines a

resistance of communication channel 104. Final Act. 6; Hunter ¶ 48. But Hunter does not use this resistance value to calculate available power at PD input port 142. Instead, Hunter uses the calculated resistance to adjust the power provided to PD 106, i.e., to adjust the *power output* by the power source equipment (PSE 102). Hunter ¶ 53.

That Hunter is teaching adjusting the power at PSE 102 becomes clear when one considers the disclosures related to Hunter's Figure 4. Hunter's Figure 4 provides a flow chart of the adjusting method. Hunter ¶ 63. In this method, PSE 102 provides power to PD 106 through communication channel 104. Hunter ¶ 64; Fig. 4: block 302. The power from PSE 102 may be limited so it does not exceed a maximum power specified by standardized Power over Ethernet (PoE) protocols. *Id.* In block 304, the power management engine 210 of computer 164 receives measurements of the voltage at PSE output port 128, the voltage at PD input port 142, and current on communication channel 104. Hunter ¶ 65. In block 306, power management engine 210 determines the resistance of the communication channel 104. Hunter ¶ 66. In blocks 308 to 316, the computer makes various decisions (blocks 308 and 310) and takes actions (blocks 312, 314, 316) based on a comparison of the resistance to a threshold resistance. Hunter ¶¶ 67–72. Particularly, in block 316, if the comparison indicates that the resistance of communication channel 104 does not exceed an acceptable threshold resistance, power management engine 210 **"**determines the amount of power that can safely be provided to the PD 106." Hunter ¶ 72. This is the amount of power at the power supply *before* power travels through channel 104, not the amount of power available *after* the power travels channel 104 and reaches port 142 of the remote unit.

The Examiner seems to equate Hunter's determination of "the amount of power that can safely be provided to the PD 106" with calculating an available power for the remote unit. Final Act. 6. But the Examiner has not provided adequate evidence or technical reasoning supporting a finding that the determination of Hunter is the same as the calculation required by the claims. Thus, Appellant has identified a reversible error in the Examiner's rejection of claims 1–20 over Hunter in view of Admon.

Rejection of claims 13–19 over Admon in view of Hunter

Turning to the rejection of claims 13–19 as obvious over Admon in view of Hunter, we note that the Examiner finds that Admon's calculation of P_{act} is a calculation of available power for the remote unit. Final Act. 13, citing col. 17, ll. 50–52; col. 18, ll. 11–20; col. 10, ll. 15–29, and step 1070.

Appellant contends P_{act} refers to the power available at the PSE, not the power available for the remote unit. Appeal Br. 9–10. The Examiner does not respond. Ans. 3–7.

In light of the Examiner's lack of response and our reading of Admon, we determine a preponderance of the evidence supports Appellant's argument. Admon adds the resistance of the cable ($R_{effective}$) to the maximum power needed by PD 70 (P_{class}) to arrive at P_{act}, i.e., the total power available from common power supply 620 to PSEs 40 for operating PD 70. Admon col. 17, l. 49–col. 18, l. 21. This reading of Admon comports with Admon's description of the flow chart of Figure 6 as showing the operation of master controller of Figure 6 as allocating power from power supply 620 to PSEs 40. *Id.*

The Examiner has provided no evidence or technical reasoning to counter Appellant's argument, which is supported by Admon's disclosure.

Thus, we determine Appellant has identified a reversible error in the Examiner's rejection of claims 13–19.

CONCLUSION

The Examiner's decision to reject claims 1–20 is REVERSED.

DECISION SUMMARY

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–20	103	Hunter, Admon		1–20
13–19	103	Admon, Hunter		13–19
Overall Outcome				1–20

REVERSED