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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/560,634	11/16/2006	Weldon L. Ransbarger	34299US	6123

28841 7590 02/27/2018

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EXAMINER
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ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
02/27/2018	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte WELDON L. RANSBARGER, JON M. MOCK, and CYRUS B. MEHER-HOMJI

Appeal 2016-001322
Application 11/560,634[1]
Technology Center 3700

Before STEVEN D.A. McCARTHY, NATHAN A. ENGELS, and PAUL J. KORNICZKY, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a rejection of claims 18, 20–23, 25, 26, and 46. Claims 1–17, 19, 24, and 27–45 are canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] Appellants identify ConocoPhillips Company as the real party in interest. Br. 2.

REPRESENTATIVE CLAIM

Claim 18, reproduced below, is the only independent claim pending and is representative of Appellants' claimed invention.

> 18. A method for compressing a refrigerant in [a liquefied natural gas ("LNG")] facility, the method comprising:
>
> providing a modular gas turbine wherein the modular gas turbine is an aeroderivative gas turbine;
>
> operably coupling the modular gas turbine to a compressor to drive the compressor to compress the refrigerant in the LNG facility, wherein the LNG facility is positioned in a location where an average ambient temperature in a calendar year is less than 50°F;
>
> overfiring the modular gas turbine for at least about 6 hours per day for a period of at least 2 successive days, wherein the step of overfiring is at least partially caused by increasing at least one modular gas turbine operating parameter;
>
> allowing the overfiring of the modular gas turbine to increase a power output of the modular gas turbine by at least about 5 percent over the modular gas turbine's maximum power output prior to the overfiring;
>
> allowing the overfiring to increase the production rate of the LNG facility by at least about 3 percent;
>
> determining the operating severity of the modular gas turbine;
>
> calculating a modified maintenance frequency of the modular gas turbine according to the operating severity;
>
> comparing the modified maintenance frequency of the modular gas turbine to a predicted maintenance frequency to determine a difference, wherein the predicted maintenance frequency is dependent on one or more manufacturer-specified turbine operating parameters; and
>
> creating an updated maintenance frequency according to the results the step of calculating the modified maintenance frequency.

THE REJECTIONS

Claims 18, 20–23, 25, 26, and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Martinez et al. (US 6,691,531 B1; issued Feb. 17, 2004); Gilbert H. Badeer, GE's LM2500+G4 AERODERIVATIVE GAS TURBINE FOR MARINE AND INDUSTRIAL APPLICATIONS (General Electric Company, 2005) ("GE NPL"); and Eker et al. (US 2004/0103068 A1; published May 27, 2004).

Claims 18, 20–23, 25, 26, and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Martinez, GE NPL, and Stothert et al. (US 7,058,552 B2; issued June 6, 2006).

ANALYSIS

According to Appellants, claim 18 defines a method that improves the operational flexibility of a liquefied natural gas ("LNG") facility employing one or more gas turbines. Br. 5. More specifically, Appellants contend claim 18 defines a method that uses an aeroderivative gas turbine in a cold weather environment to increase a production rate of the LNG facility, in part by "overfiring" the gas turbine for a specified period of time and updating the "maintenance frequency" accordingly. Br. 6.

Appellants' Specification defines "overfiring" as increasing one or more turbine operating parameters, such as the firing temperature, above the manufacturer-provided rated values. Spec. 8; *accord* Spec. 18. The Specification also explains that overfiring decreases the time between required maintenance for the turbine—the turbine's "maintenance frequency." Spec. 8–9; *see also* Spec. 18 (defining "maintenance frequency" as "the time between performing planned or unplanned

maintenance on the turbine wherein the turbine is shut down during maintenance").

Appellants state that LNG facilities are more efficient in cold-weather environments, but, according to Appellants, "the decreased efficiency during a warm season can be offset by increasing the power output of the modular gas turbine beyond the point of the manufacturer's rated operating conditions," e.g., overfiring. Br. 6. "The claimed updated maintenance frequency of the modular gas turbine addresses issues associated with overfiring and operating the gas turbine above the rated conditions." Br. 6.

Appellants argue "the nexus between Appellant[s'] claimed use of aeroderivative turbines in cold weather climates that experience temporary ambient temperature increases is simply not addressed by the cited prior art." Br. 7. Specifically, although Appellants acknowledge that Martinez discloses use of gas turbines for LNG production, Appellants argue (i) Martinez does not state that its gas turbines are of the aeroderivative type and (ii) Martinez is silent regarding overfiring and modifying maintenance due to overfiring. Br. 6–7. Next, Appellants argue the Examiner's citation of the GE NPL, a gas turbine manufacturer's publication, "cannot and does not teach deviating from a manufacturer's rated operating conditions, such as overfiring, [and] actually teaches away from Appellant's claimed method." Br. 7.

We find Appellants' arguments unpersuasive. The Examiner cites Martinez for its teachings of gas turbines for LNG production and cites GE NPL as evidence that aeroderivative-type turbines were known for use in LNG production. *See* Final Act. 3. Contrary to Appellants' "teaching away" arguments, nothing in GE NPL disparages "overfiring" or use of

aeroderivative gas turbines in cold-weather climates. In fact, GE NPL specifically describes use of gas turbines "across a wide range of ambient conditions" and provides a graph of power production "during off-ISO conditions, as in cold day/hot day" for a temperature range of 0°F–100°F. GE NPL at 6, Fig. 6. Further, GE NPL identifies the same aeroderivative gas turbines as those listed in Appellants' Specification as examples of gas turbines suitable for LNG production. *Compare* GE NPL at 1 (identifying the LM1600, LM2000, LM2500, LM2500+, LM6000, and LMS100 gas turbines manufactured by GE), *with* Spec. 7 (listing the same gas turbines "available from GE Power Solutions").

Regarding the overfiring and maintenance limitations, the Examiner finds that each of Eker and Stothert teaches increasing the operations of a gas turbine to increase production (i.e., overfiring), while recognizing that such increases affect maintenance. Final Act. 4 (citing Eker ¶¶ 4, 13, 37, 39), 6–7 (citing Stothert 1:46–51, 1:53–60, 3:20–25); Ans. 18–20, 22. According to Appellants, "Eker discloses a model to optimize the tradeoff between greater profits from higher firing temperatures and greater costs of increased maintenance and replacement of turbine parts," but Appellants argue Eker "is completely silent regarding use of a gas turbine in a cold weather climate" and "there is no explicit suggestion that Eker's model would generate the firing profile desired by Appellant." Br. 8. Similarly, Appellants contend "Stothert discloses a model to optimize the tradeoff between greater profits from higher firing temperatures and greater costs of increased maintenance and replacement of turbine parts," but "there is no explicit suggestion that Stothert's model would generate the firing profile desired by Appellant[s]." Br. 13. As such, Appellants argue there is no

teaching, suggestion, or motivation in the cited references to modify the references to arrive at the claimed invention and "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art." Br. 9, 13 (quoting MPEP 2143.01; citing *KSR Int'l Co. v. Teleflex Inc.*, 550 US 398, 417 (2007)).

We disagree with Appellants. Appellants' Specification identifies a gas turbine's "firing temperature" as one operating parameter than can be increased to cause overfiring. Spec. 8. Eker expressly teaches that increasing a gas turbine's firing temperature for a period of time increases its production but "also affects turbine part wear and tear and correspondingly determines intervals between turbine maintenance." Eker ¶ 13. Stothert similarly teaches that it may be financially advantageous to operate a gas turbine "outside normal conditions" when higher production more than compensates for higher maintenance. Stothert 1:46–60. Based on the cited teachings, we agree with the Examiner that the claimed minimum time of overfiring for at least six hours per day for two consecutive days is reasonably suggested by each of Eker and Stothert, which disclose models for calculating production rates over periods of time. *See* Final Act. 9, Ans. 19–21; Eker ¶¶ 33 (suggesting operating intervals of weeks or months), 36 (stating "it takes approximately 2 days to produce a firing temperature profile" and suggesting modeling a constant firing temperature for a 12-hour period for 30 days), Fig. 1 (graphing profits from production over a range of 0 to over 35 hours); Stothert 1:46–60 (suggesting modeling plant operations over time as a function of component aging, suggesting intervals exceeding

the expected life of a component by considering "replacement costs due to increased component degradation").

Having considered the Examiner's rejections in light of each of Appellants' arguments and the evidence of record, we disagree with Appellants and sustain the Examiner's rejection of claims 18, 20–23, 25, 26, and 46 under 35 U.S.C. § 103(a) in view of Martinez, GE NPL, and Eker. For the same reasons, we also sustain the Examiner's rejection of claims 18, 20–23, 25, 26, and 46 under 35 U.S.C. § 103(a) in view of Martinez, GE NPL, and Stothert.

The Examiner's Answer additionally identifies two "New Ground(s) of Rejection" in which the Examiner cites an additional reference, in addition to the combinations of prior art addressed above, as evidence to support the "well known" fact that LNG production occurs at or near the arctic with its teachings regarding aeroderivative gas turbines for LNG production at a facility north of Hammerfest, Norway. Ans. 9–15. Appellants did not file a reply brief or otherwise respond to the Examiner's new rejections, and we accordingly sustain those rejections pro forma. *See* 37 CFR 41.39(b) (stating that appellants must respond to an examiner's answer that contains a rejection designated as a new ground or rejection within two months).

DECISION

For the above reasons, we affirm the Examiner's rejection of claims 18, 20–23, 25, 26, and 46.

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

AFFIRMED