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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* CAROLUS ANTONIUS CORNELIS VAN DE LISDONK,  
WOUTER JAN MEIRING, and  
ROBERT KLEIN NAGEL VOORT

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Appeal 2018-001375  
Application 13/320,770  
Technology Center 3700

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Before STEVEN D.A. McCARTHY, MICHAEL L. HOELTER, and  
SEAN P. O'HANLON, *Administrative Patent Judges*.

HOELTER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is a decision on appeal, under 35 U.S.C. § 134(a), from the Examiner's Final Rejection of claims 1, 3, 4, 6, 7, 9–13, 15–19, and 22–26. Br. 1, 2, 7. We have jurisdiction under 35 U.S.C. § 6(b). For the reasons explained below, we do not find error in the Examiner's rejection.

Accordingly, we AFFIRM the rejection of these claims.

THE CLAIMED SUBJECT MATTER

The disclosed subject matter “relates to a method of cooling a gaseous hydrocarbon stream to produce a liquefied hydrocarbon stream.” Spec. 1:1–

3. Method claims 1 and 16, and apparatus claims 13 and 22, are independent. Claim 1 is illustrative of the claims on appeal and is reproduced below.

1. A method of cooling a gaseous hydrocarbon stream to produce a liquefied hydrocarbon stream, comprising:
  - cooling the gaseous hydrocarbon stream in one or more heat exchangers using a first refrigerant from a first refrigerant circuit in which said first refrigerant is compressed in a first compressor driven by a first gas turbine having a first inlet air stream, said cooling providing a cooled hydrocarbon stream;
  - liquefying the cooled hydrocarbon stream using a second refrigerant, which second refrigerant is compressed in a second compressor driven by a second gas turbine having a second inlet air stream, and cooled at least by heat exchanging with said first refrigerant from the first refrigerant circuit, said liquefying providing a liquefied hydrocarbon stream;
  - providing a stream of a chilled coolant, comprising chilling a fluid;
  - dividing a cooling duty available in the chilled coolant between at least first and second parts, in accordance with a common input parameter; and,
  - cooling one or both of said first and second inlet air streams with the chilled coolant, whereby the cooling duty available in the first part is used to cool the first inlet air stream, and the cooling duty available in the second part is used to cool the second inlet air stream,wherein said providing of the cooled hydrocarbon stream comprises producing a partially condensed hydrocarbon stream from the gaseous hydrocarbon stream and passing the partially condensed hydrocarbon stream through a gas/liquid phase separator and drawing a liquid bottom stream and a vaporous overhead stream from the gas/liquid phase separator, and wherein the fluid is actively chilled using refrigeration duty taken from the liquid bottom stream, wherein the common input parameter is used to divide the cooling duty available in the chilled coolant such as to provide relatively more chilling duty to the inlet air stream of the gas turbine that drives the most

constraining refrigerant circuit of the first and second refrigerant circuits.

#### REFERENCES RELIED ON BY THE EXAMINER

|                |                    |               |
|----------------|--------------------|---------------|
| Sharma et al.  | US 4,710,214       | Dec. 1, 1987  |
| Fanning et al. | US 6,324,867 B1    | Dec. 4, 2001  |
| Mak            | US 2009/0282836 A1 | Nov. 19, 2009 |

#### THE REJECTION ON APPEAL<sup>1</sup>

Claims 1, 3, 4, 6, 7, 9–13, 15–19, and 22–26 stand rejected under 35 U.S.C. 103(a) as unpatentable over Fanning, Mak, and Sharman.

#### ANALYSIS

Appellants argue the four independent claims together (*see* Br. 8, 9) and do not present any additional arguments for any of the dependent claims. Accordingly, we select method claim 1 for review, with the remaining claims (i.e., 3, 4, 6, 7, 9–13, 15–19, and 22–26) standing or falling with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

We first note that claim 1 recites “first and second refrigerant circuits.” Although there is antecedent basis for the “first” such circuit, there is no antecedent basis for the “second” such circuit. However, a review of Appellants’ Specification, and also Appellants’ Appeal Brief (and particularly page 3 thereof), readily leads one to understand that the recited “second” circuit correlates to the “liquefying” step which describes a “second” refrigerant, compressor, turbine, and air stream. Thus, based on this understanding of “second refrigerant circuit,” we proceed with our analysis.

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<sup>1</sup> The Examiner has withdrawn the rejection of claims 23–26 as failing to comply with the written description requirement. Ans. 2.

The Examiner primarily relies on the teachings of Fanning for disclosing the multiple refrigerant circuits, compressors, turbines, and air streams, but acknowledges that Fanning “does not teach dividing the cooling duty . . . based on a common input parameter” as recited. Final Act. 4–6, Ans. 5, 6. The Examiner states that “dividing a coolant or a heat transfer fluid based on a certain factor . . . is well known in the art, as taught by Mak.” Final Act. 6. The Examiner also provides a reason for incorporating such teachings into Fanning, i.e., “for the purpose of maximizing output and power generation of the turbines.” Final Act. 7; *see also* Ans. 4, 7. The Examiner also expresses a reason for the additional reliance on Sharma, and the motivation for doing so. *See* Final Act. 8.

Appellants do not challenge the Examiner’s reliance on Sharma; instead, Appellants challenge the Examiner’s reliance on Mak and/or the usage of Mak’s teachings in Fanning. Br. 9–13. For example, Appellants contend “Mak specifically lacks a disclosure of ‘first and second refrigerant circuits.’” Br. 9. However, the Examiner explains that Mak was not relied on for teaching such circuits, but instead, “Mak is only introduce[d] for its teaching of dividing or splitting a coolant based on a common input parameter.” Ans. 3, 5–7; *see also* Final Act. 6 (citing Mak ¶ 26).<sup>2</sup> Appellants’ other arguments pertaining to Mak disclosing only a single turbine, or contending that “[a]dditional modification[s] to Mak would be required” (Br. 10, and 11–13), are equally not persuasive because the Examiner did not (a) rely on Mak for teaching such structure or (b) attempt

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<sup>2</sup> Paragraph 26 of Mak states, “[t]he flow ratio between 7 and 6 depends on the cooling duty required by the air pre-coolers that is a function of ambient temperatures and gas turbine capacity.”

to modify Mak. *See* Ans. 3 (“[T]he primary reference Fanning disclosed” such structure, but not “dividing the cooling duty.”). Accordingly, Appellants’ contentions focusing on Mak’s structure, or a modification thereto, is not persuasive of Examiner error.

Appellants also contend, “Fanning teaches away from modifying its disclosure.” Br. 13. This is because, “Fanning teaches to maintain ‘the inlet air for [both] the gas turbines at a constant low temperature.’” Br. 13. However, Appellants do not explain how maintaining a constant low air temperature at the gas turbine inlets precludes dividing coolant flow to such inlets. The Examiner states that nowhere in Fanning is there a disclosure that “teaches excluding or teach[es] against the concept of splitting a cooling duty in a coolant based on common parameter.” Ans. 8. In other words, Appellants identify no passage in Fanning that might be critical of applying Mak’s teaching; nor do Appellants identify where Fanning teaches that the air temperature at both inlets must be identical (only that they must be “at a constant low temperature”). Br. 13. Thus, Appellants’ “teaching away” argument is not persuasive of Examiner error.

Appellants further contend, “Fanning and Mak relate to non-analogous art.” Br. 14. Generally, a non-analogous art argument attempts to distinguish a reference from the claimed device, not that the cited references themselves are non-analogous vis-à-vis each other. Thus, to the extent Appellants contend that Fanning and Mak are not analogous to Appellants’ device, the Examiner dispels that notion by explaining how each is analogous to Appellants’ device. *See* Ans. 9. However, to the extent Appellants are contending that Fanning and Mak are not, themselves, combinable together, we disagree because Appellants do not explain how

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Mak's teaching of dividing coolant duty is unable to be employed in Fanning.

Accordingly, and based on the record presented, we are not persuaded the Examiner erred in rejecting claims 1, 3, 4, 6, 7, 9–13, 15–19, and 22–26 as being obvious over Fanning, Mak, and Sharma.

#### DECISION

The Examiner's rejection of claims 1, 3, 4, 6, 7, 9–13, 15–19, and 22–26 is affirmed.

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

AFFIRMED