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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AUGUSTO SAN CRISTOBAL

Appeal 2019-006244
Application 14/801,221
Technology Center 3700

Before STEFAN STAICOVICI, ERIC C. JESCHKE, and
AMANDA F. WIEKER, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner’s decision in the Final Office Action (dated Oct. 18, 2018, hereinafter “Final Act.”) rejecting claims 1–15. We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

SUMMARY OF DECISION

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Bronswerk Marine Inc. is identified as the real party in interest in Appellant’s Appeal Brief 3 (filed Mar. 18, 2019, hereinafter “Appeal Br.”).

INVENTION

Appellant's invention relates to sea or fresh water-cooled refrigeration systems used in ships. Spec. para. 2.

Claim 1 is illustrative of the claimed invention and reads as follows:

1. A self-enclosed modular refrigeration unit of a refrigeration system comprising:
 - at least one compressor adapted to compress a refrigerant;
 - a heat exchanger adapted to be connected to a cooling water network to condense the refrigerant with cooling water;
 - a suction line connected to a suction side of the compressor and adapted to provide a feed of refrigerant to the compressor;
 - a discharge line connected to a discharge side of the compressor and to the heat exchanger to direct compressed refrigerant to the heat exchanger;
 - a head pressure control valve in the discharge line downstream of the heat exchanger to control an upstream pressure;
 - a casing enclosing the compressor, the heat exchanger, the head pressure control valve;
 - an outlet line having an outlet end downstream of the head pressure control valve adapted to output cooling refrigerant having passed through the head pressure control valve; and
 - an inlet end upstream of the suction line adapted to provide a feed of refrigerant to the compressor.

REJECTIONS

- I. The Examiner rejects claims 1–6, 8, and 9 under 35 U.S.C. § 103 as being unpatentable over Song,² Hamilton,³ and Tipton.⁴
- II. The Examiner rejects claim 7 under 35 U.S.C. § 103 as being unpatentable over Song, Hamilton, Tipton, and Jayanth.⁵
- III. The Examiner rejects claims 10, 13, and 14 under 35 U.S.C. § 103 as being unpatentable over Horton,⁶ Song, Hamilton, and Tipton.
- IV. The Examiner rejects claim 11 under 35 U.S.C. § 103 as being unpatentable over Horton, Song, Hamilton, Tipton, and Jin.⁷
- V. The Examiner rejects claim 12 under 35 U.S.C. § 103 as being unpatentable over Horton, Song, Hamilton, Tipton, and Yano.⁸
- VI. The Examiner rejects claim 15 under 35 U.S.C. § 103 as being unpatentable over Horton, Song, Hamilton, Tipton, and Sakae.⁹

² Song et al., US 2006/0123817 A1, published June 15, 2006.

³ Hamilton, US 2013/0186122 A1, published July 25, 2013.

⁴ Tipton, US 2002/0139137 A1, published Oct. 3, 2002.

⁵ Jayanth et al., US 2012/0075754 A1, published Mar. 29, 2012.

⁶ Horton, US 4,356,708, issued Nov. 2, 1982.

⁷ Jin et al., US 2006/0112705 A1, published June 1, 2006.

⁸ Yano, US 2007/0039346 A1, published Feb. 22, 2007.

⁹ Sakae et al., US 2010/0154465 A1, published June 24, 2010.

ANALYSIS

Rejection I

Appellant does not present arguments for the patentability of claims 2–6, 8, and 9 apart from claim 1. *See* Appeal Br. 8–18. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 1 as the representative claim to decide the appeal of the rejection of these claims, with claims 2–6, 8, and 9 standing or falling with claim 1.

The Examiner finds that Song discloses an air conditioning system including, *inter alia*, heat exchanger 54, but “does not teach that the heat exchanger is connected to a cooling water network and is adapted to condense the refrigerant with cooling water.” Final Act. 3–4 (citing Song, paras. 52, 62, 63, Fig. 2). Nonetheless, the Examiner finds Hamilton discloses refrigeration unit 11 including heat exchanger 15 connected to cooling water network 12 and adapted to condense the refrigerant. *Id.* at 4 (citing Hamilton, para.25). Thus, the Examiner concludes that it would have been obvious for a person of ordinary skill in the art to connect Hamilton’s cooling water network 12 to Song’s heat exchanger 54 because, “by water cooling the refrigerant within the condenser as opposed to air cooling[,] . . . a greater rate of heat transfer would have occurred between the refrigerant and the heat medium improving performance of the refrigeration unit.” *Id.* According to the Examiner “it is known in the refrigeration art to have water cooled condensers,” as evidenced by Cawley (US 2003/0057396 A1, published Mar. 27, 2003), which “discloses typical cooling mediums to cool refrigerant in heat exchangers being air and water” and Park et al. (US 2012/0138270 A1, published June 7, 2012, hereinafter “Park”), which discloses in paragraph 7 that in “the water-cooled condensers . . . the

cooling efficiency is higher than the air-cooled condensers’.” Final Act. 15–16; Advisory Action 2 (dated Dec. 27, 2018, hereinafter “Adv. Act.”).

Appellant argues that the Examiner arrived at the rejection by employing impermissible hindsight reconstruction. *See* Appeal Br. 15. According to Appellant, because Song’s disclosure is limited to an air heat exchanger, the Examiner has failed to provide objective evidence as to “why such unconventional modifications to an indoor hot water system . . . would have been obvious to the POSITA.” *Id.* at 15–16.

We are not persuaded by Appellants’ argument that the Examiner’s determination of obviousness is based on impermissible hindsight reconstruction. The Examiner has provided adequate reasoning with rational underpinnings to combine the teachings of Song and Hamilton, namely, to improve the performance of Song’s refrigeration unit “by replacing the air to refrigerant heat exchanger with the water to refrigerant heat exchanger.” *See* Examiner’s Answer (dated June 21, 2019, hereinafter “Ans.”) 6; *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds [require] some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”), *cited with approval in KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). In fact, the Examiner’s modification constitutes an *improvement* to Song’s air conditioning system to replace the air to refrigerant heat exchanger with the water to refrigerant heat exchanger to lead to the predictable result of improved cooling efficiency, as evidenced by Park, and the modification is well within the skill of one having ordinary skill in this art. *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the

same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

Appellant further argues that the Examiner has failed to provide “any objective evidence as to how a POSITA would have routed an indoor hot water tank water supply to the outside for connection to an outdoor air conditioning unit.” Appeal Br. 15. Appellant explains that because Song’s air conditioning system is employed in a continuous manner, thereby generating high heat outputs, whereas Hamilton’s hot water tank is small and used intermittently, “the Song refrigeration system, if connected to the Hamilton water heater, would become inoperable for its intended purpose of air conditioning,” due to Hamilton’s insufficient heat storage capacity. *Id.* at 16–17 (citing Song, paras. 24, 25); Reply Brief 3–4 (dated Aug. 21, 2019, hereinafter “Reply Br.”). Thus, according to Appellant, some of the heated water in the system of Song, as modified by Hamilton, would have been used and replaced with fresh water before the air conditioning system would be able to function as intended. Appeal Br. 17. As such, Appellant asserts that a skilled artisan’s acknowledgment of “Song’s outdoor air conditioner . . . be[ing] rendered inoperable for its intended purpose . . . would have superseded any possible benefit of trying to achieve a higher operating efficiency of the air conditioner as alleged by the Examiner.” *Id.*

We are not persuaded by Appellant’s arguments because [t]o justify combining reference teachings in support of a rejection it is not necessary that a device shown in one reference can be physically inserted into the device of the other. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed

invention must be expressly suggested in any one or all of the references.

In re Keller, 642 F.2d 413, 425 (CCPA 1981) (internal citations omitted). In this case, we agree with the Examiner that the rejection does not “state[] that the indoor hot water tank of Hamilton would be placed on the outside.”

Ans. 8 (emphasis omitted). The Examiner is also correct that the rejection “should not be taken as a bodily incorporation of the *water heater* of Hamilton into the prior art of Song.” *Id.* at 9 (emphasis added). Rather, the Examiner is providing Hamilton’s water-cooled condenser and cooling water network to Song’s refrigeration unit such that the water-cooled heat exchanger of Song, as modified by Hamilton, would be “connected to a cooling network and . . . [would be] adapted to condense the refrigerant with cooling water as taught by Hamilton.” *Id.* at 8.

Naturally, some adaptations would be required when modifying Song’s refrigeration unit to include Hamilton’s water-cooled condenser connected to a cooling water network. However, we must attribute skill to the hypothetical person described in 35 U.S.C. § 103(a). *In re Sovish*, 769 F.2d 738, 742 (Fed. Cir. 1985). The fact that some judgment and mechanical skill may be required to select the appropriate size and capacity of Hamilton’s water-cooled condenser and cooling water network, when adapting it to Song’s refrigeration unit, to arrive at the recited combination, does not necessarily mean that such combination constitutes a nonobvious invention. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 10–12 (1966) (discussing *Hotchkiss v. Greenwood*, 11 How. 248 (1851)).

Finally, we are also not persuaded by Appellant’s argument that “swapping the water-cooled condenser as taught by Park . . . into the hot

water system of Hamilton instead of Hamilton's heat exchanger 14 would clearly fail to remedy the resulting inoperability of Song" because this argument does not address the Examiner's rejection. Appeal Br. 18. The Examiner is correct in stating that "Park was cited as *evidence* . . . to demonstrate that it would have been obvious to replace the air cooled condenser [of Song] with a water cooled condenser, [as taught by Hamilton,] in order to improve the performance/efficiency of the invention of Song." Ans. 11 (emphasis added). Hence, the Examiner's rejection does not employ Park to modify Hamilton's hot water system, as Appellant asserts, but rather as *evidence* to support a reason with rational underpinning to modify Song's refrigeration unit to include Hamilton's water-cooled condenser and cooling water network, namely, to improve the performance of Song's refrigeration unit by improving its cooling efficiency. Moreover, the fact that the Examiner's reason to provide Hamilton's water-cooled condenser and cooling water network to Song's refrigeration unit is to improve cooling efficiency, may come at the expense of an air-cooled condenser's design simplicity "should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another." *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000); *see also* Park para. 7.

In conclusion, for the foregoing reasons, we sustain the rejection under 35 U.S.C. § 103 of independent claim 1 as unpatentable over Song, Hamilton, and Tipton. Claims 2–6, 8, and 9 stand with claim 1.

Rejections II–VI

Appellant relies on the arguments discussed *supra* in Rejection I, and, in addition, asserts “claims 2–15 also recite additional features further distinguishing them over the prior art of record.” *See* Appeal Br. 18. Such arguments are insufficient to apprise us of error in Rejections II–VI. *See In re Lovin*, 652 F.3d 1349 (Fed. Cir. 2011) (“[W]e hold that the Board reasonably interpreted Rule 41.37 to require more substantive arguments in an appeal brief than a mere recitation of the claim elements and naked assertion that the corresponding elements were not found in the prior art.”).

Accordingly, for the same reasons discussed above, we likewise sustain Rejections II–VI.

CONCLUSION

Claim(s) Rejected	35 U.S.C. §	Reference(s)/ Basis	Affirmed	Reversed
1–6, 8, 9	103	Song, Hamilton, Tipton	1–6, 8, 9	
7	103	Song, Hamilton, Tipton, Jayanth	7	
10, 13, 14	103	Horton, Song, Hamilton, Tipton	10, 13, 14	
11	103	Horton, Song, Hamilton, Tipton, Jin	11	
12	103	Horton, Song, Hamilton, Tipton, Yano	12	
15	103	Horton, Song, Hamilton, Tipton, Sakae	15	

Appeal 2019-006244
Application 14/801,221

Overall Outcome			1-15	
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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