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MCDERMOTT WILL & EMERY LLP THE MCDERMOTT BUILDING 500 NORTH CAPITAL STREET, N.W. WASHINGTON, DC 20001			TANENBAUM, TZVI SAMUEL	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SUSUMU KOBAYASHI and HIROYUKI SATOU

Appeal 2019-003373
Application 14/668,974
Technology Center 3700

Before JENNIFER D. BAHR, MICHELLE R. OSINSKI, and
SEAN P. O’HANLON, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant¹ appeals under 35 U.S.C. § 134(a) from the Examiner’s decision rejecting claims 1–3 under 35 U.S.C. § 103(a) as unpatentable over Takasugi (US 2004/0118145 A1, pub. June 24, 2004), van Wijngaarden (US 2008/0184735 A1, pub. Aug. 7, 2008), and Yuzawa (US 6,951,115 B2, iss. Oct. 4, 2005).² We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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 Panasonic Healthcare Holdings Co., Ltd. Appeal Br. 1.

² The Examiner withdrew a rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Takasugi, van Wijngaarden, and Takemasa (US 5,351,499, iss. Oct. 4, 1994). Ans. 3.

THE CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter.

1. A binary refrigeration apparatus comprising:
 - a high temperature refrigeration cycle; and
 - a low temperature refrigeration cycle including an evaporator; and
 - a cascade condenser connecting the high temperature refrigeration cycle and the low temperature refrigeration cycle, wherein:
 - the high temperature refrigeration cycle is filled with propane and a refrigerator oil,
 - the low temperature refrigeration cycle is filled with a refrigerant including a hydrocarbon having a boiling point of -80°C or lower, a refrigerator oil, and an oil return agent,
 - an ultralow temperature of -80°C or lower is produced by evaporating the hydrocarbon in the evaporator,
 - the hydrocarbon having a boiling point of -80°C or lower consists of ethane,
 - the oil return agent is contained in an amount of from 0.1 to 14 mass% with respect to the ethane in the refrigerant in the low temperature refrigeration cycle, and
 - the low temperature refrigeration cycle does not include an oil separator.

OPINION

In rejecting claim 1, the Examiner finds that Takasugi discloses a binary refrigeration apparatus including, in relevant part, “a low temperature refrigeration cycle . . . filled with a refrigerant (e.g. ethane, see par. 47) including a hydrocarbon (e.g. ethane, see par. 47).” Final Act. 4 (italics omitted). The Examiner finds that Takasugi does not disclose an oil return agent contained in an amount of 0.1 to 14 mass% with respect to the ethane in the refrigerant. *Id.* at 5. However, the Examiner finds that Yuzawa

teaches a refrigerant composition comprising 0.1 to 12 wt % of an oil return agent (e.g. with respect to a fluorocarbon based refrigerant, see col 1, lines 46–59); wherein the oil return agent is n-pentane (see col 1, lines 60–61). Yuzawa teaches that the addition of 0.1 to 12 wt % of the oil return agent to the refrigerant further improved recovery of oil (see col 4, lines 20–22).

Id. at 6. The Examiner determines that it would have been obvious “to modify Takasugi by Yuzawa, using the known technique of adding a specific amount of oil return agent to a refrigerant in order to improve the recovery of oil.” *Id.*

Appellant argues that the Examiner’s rejection is in error because “[n]one of the cited reference[s] disclose or suggest the amount of the oil return agent with respect to ethane, and there is no motivation or suggestion to arrive at the claimed configuration based on the disclosures of the cited reference[s] without referring to the present application.” Appeal Br. 4. We agree that a sustainable case of obviousness has not been established.

Takasugi discloses low-temperature side refrigerant circuit L in which refrigerants “R744A (nitride suboxide), R170 (ethane), a mixed refrigerant of R740 (argon), R50 (methane), R14 (tetrafluoromethane) and R23 (trifluoromethane) or the like may be used.” Takasugi ¶ 47. Yuzawa discloses “[a] refrigerant composition . . . [that] comprises R245fa (CF₃CH₂CHF₂), R125 (CHF₂CF₃), R23 (trifluoromethane: CHF₃) and R14 (tetrafluoromethane: CF₄).” Yuzawa, 1:46–49. Yuzawa also discloses adding n-pentane to the refrigerant composition at 0.1 to 12 wt % to improve oil recovery. *Id.* at 4:20–22. In other words, Yuzawa discloses using n-pentane in an amount of 0.1 to 12 wt % with respect to a *fluorocarbon* refrigerant *composition* including a mixture of refrigerant constituents, but

not with respect to *ethane* in a refrigerant composition. Indeed, the Examiner states in the Answer that “it is admitted that Yuzawa does not specifically teach the amount of the oil return agent with respect to ethane.” Ans. 4. However, the Examiner maintains that using the claimed amount of oil return agent with respect to the ethane in Takasugi would have been obvious to one of ordinary skill in the art. *See id.* at 4–5 (explaining that the proposed modification would predictably result in improved oil recovery).

Here, the Examiner has not sufficiently articulated a rational evidentiary underpinning to explain why, given the teachings of Yuzawa, one of ordinary skill in the art would have been prompted to modify Takasugi to use an oil return agent (i.e., n-pentane) in an amount of 0.1 to 14 mass % with respect to *ethane*. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “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)). The Examiner posits:

Just as the device of Yuzawa was improved by adding an oil return agent in an amount of 0.1 to 12 wt% with respect to some working fluid of a refrigerant composition (e.g. a fluorocarbon based composition) for an ultralow refrigeration circuit (see par. 15 of the Office action dated 7/23/2018; Yuzawa col 4 lines 20–22) one of ordinary skill in the art would recognize that the device of Takasugi would likewise likely be improved by adding an oil return agent in an amount of 0.1 to 14 mass% with respect to a different working fluid of a refrigerant composition (e.g. ethane) for an ultralow refrigeration circuit.

Ans. 4–5. However, the Examiner does not set forth any evidence or persuasive technical explanation to support this speculative position. Such speculation is insufficient to support an obviousness conclusion. *See In re*

Warner, 379 F.2d 1011, 1017 (CCPA 1967) (Rejections based on obviousness must rest on a factual basis; in making such a rejection, the Examiner has the initial burden of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions, or hindsight reconstruction to supply deficiencies in the factual basis.).

Accordingly, based on the record before us, the Examiner has not met the burden of establishing a proper case that claim 1 is unpatentable based on the cited references. On this basis, we do not sustain the rejection of claim 1, or its dependent claims 2 and 3, under 35 U.S.C. § 103(a) as unpatentable over Takasugi, van Wijngaarden, and Yuzawa.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1-3	103(a)	Takasugi, van Wijngaarden, Yuzawa		1-3

REVERSED