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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MATTHEW GRIST and DAVID PERKINS

Appeal 2019-003469
Application 14/372,098
Technology Center 3700

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

OSINSKI, *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 1–4, 6–13, 17, 18, and 29–32.² We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

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 R.B. Radley & Company Limited. Appeal Br. 2.

² Claims 23–28 are withdrawn, and claims 5, 14–16, and 19–22 are cancelled. Appeal Br. 17–22 (Claims App.).

THE CLAIMED SUBJECT MATTER

Claims 1, 30, 31, and 32 are independent. Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. An air-cooled laboratory gas condenser for condensing gasses and vapours, comprising:
 - an inner tube having an elongate length and a bore extending therethrough between a first end region and a second end region of the inner tube;
 - an outer tube having a bore therethrough and two ends, the inner tube passing through the bore of the outer tube; and
 - a seal at each end of the outer tube, sealing the outer tube to the inner tube at the first and second end regions so as to define an annular elongate sealed space between the inner tube and the outer tube extending along the elongate length of the inner tube between the seals, wherein the sealed space is at least partly filled or is adapted to be at least partly filled with a liquid such that the liquid is in contact with both the inner tube and the outer tube, wherein the outer tube is made from a metal material and comprises a plurality of internal fins extending into the sealed space between the inner tube and the outer tube and a plurality of external fins extending outwardly from an outer surface of the outer tube and wherein the inner tube is made from glass.

EVIDENCE

The Examiner relied on the following evidence in rejecting the claims on appeal:

Kendall	US 1,936,166	Nov. 21, 1933
Iida	US 3,967,591	July 6, 1976
Matsuzaki	US 4,194,560	Mar. 25, 1980
Dankowski	US 4,345,644	Aug. 24, 1982
Kleisle	US 4,740,981	Apr. 26, 1988
Mayo	US 4,770,746	Sept. 13, 1988

Allgäuer	US 4,778,002	Oct. 18, 1988
Nitta	US 5,735,342	Apr. 7, 1998
Lin	US 7,487,824 B2	Feb. 10, 2009
Steadman	GB 606284	Aug. 11, 1948

THE REJECTIONS³

- I. Claims 1, 2, 6–8, 10, 13, 17, 29, and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, and Lin. Final Act. 3–8.
- II. Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, and Matsuzaki. *Id.* at 8–9.
- III. Claims 9 and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, and Nitta. *Id.* at 9–12.
- IV. Claim 11 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, Allgäuer, and Dankowski. *Id.* at 13–14.
- V. Claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, and Mayo. *Id.* at 14.
- VI. Claim 18 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, Matsuzaki, and Kendall. *Id.* at 15–16.

³ The Examiner withdrew a rejection of claim 31 under 35 U.S.C. § 112, second paragraph, as being indefinite. Ans. 3; *see also* Final Act. 3.

VII. Claim 32 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, Lin, Kendall, Nitta, Allgäuer, and Dankowski. *Id.* at 16–21.

OPINION

Rejection I

In contesting the rejection of claims 1, 2, 6–8, 10, 13, 17, 29, and 31, Appellant presents arguments for independent claim 1 (*see* Appeal Br. 10–13), and relies on the same arguments for independent claim 31 and dependent claims 2, 6–8, 10, 13, 17, and 29 (*see id.* at 13). We select claim 1 as representative, and claims 2, 6–8, 10, 13, 17, 29, and 31 stand or fall with claim 1. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds that Steadman teaches most of the limitations recited in claim 1, including, in relevant part, a “sealed space between the inner and outer tubes . . . at least partially filled with a fluid such that the fluid is necessarily in contact with both the inner and outer tubes (Page 1, lines 73–85).” Final Act. 4. The Examiner finds that Steadman does not teach that the sealed space contains a liquid. *Id.* However, the Examiner finds that Iida teaches a heat exchanger having “a gap between the inner and outer tubular members (Figure 3: Region accommodating element ‘7’) [that] is adapted to contain a liquid in contact with the inner tube and the outer tube (Col. 3, lines 9–24, col. 4, lines 1–14, and Figure 3).” *Id.* at 5. The Examiner determines that it would have been obvious to modify Steadman to include a liquid in the sealed space, as taught by Iida, in order “to improve heat transfer between first and second fluids via providing an intermediate heat exchange liquid having good thermal conductivity.” *Id.*

The Examiner also finds that Steadman does not teach “the outer tube as comprising a metal material.” Final Act. 5. However, the Examiner finds that Lin teaches an “outer tube [that] comprises metal material (Col. 3, lines 28–41), thereby imparting the outer tube with good thermal conductivity.” *Id.* The Examiner determines that it would have been obvious to modify Steadman to have a metal outer tube, as taught by Lin, in order “to improve heat dissipation capacity of the outer tube by defining the outer tube of thermally conductive metals.” *Id.*

The Examiner further finds that Steadman does not teach “the inner tube as comprising a glass material.” Final Act. 5. However, the Examiner finds that Kleisle teaches an “inner tube [that] comprises glass (Col. 5, lines 30–35), thereby defining a non-contaminating material.” *Id.* at 6; *see also id.* (finding that Kleisle “expressly teaches combining a glass inner tube with a metal outer tube (Col. 1, line 66 to col. 2, line 6, see also col. 6, lines 52–64)”). The Examiner determines that it would have been obvious to modify Steadman to have a glass inner tube, as taught by Kleisle, in order “to prevent contamination of a medium passing within the inner tube by constructing the inner tube using a non-reactive material.” *Id.*

Appellant argues that the Examiner’s rejection is in error because the cited references are non-analogous art. Appeal Br. 10–13. For the reasons that follow, we are unpersuaded by Appellant’s argument.

The established precedent of our reviewing court sets up a two-fold test for determining whether art is analogous: “(1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which

the inventor is involved.” *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (quoting *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)).

Appellant argues that the “field of endeavor is providing an improved air-cooled laboratory gas condenser” (Appeal Br. 11), and “[n]one of the cited references is related to condensing gasses and vapours in an air-cooled laboratory gas condenser” (*id.* at 12). In particular, Appellant asserts that

Steadman is directed to “a vehicle heater adapted to abstract heat from an engine exhaust system.” *See* Steadman, pg. 1, 1. 14. . . .

[I]ida is directed to a “steam generator for a fast breeder reactor.” *See* [I]ida, Abstract. . . .

Kleisle is directed to a “temperature controller unit for use in a gas laser resonator.” *See* Kleisle, Abstract. . . .

Lastly, Lin is directed to a cooling device for an electric component. *See* Lin, col. 1, ll. 5–8.

Id. at 11–12. Appellant maintains “[t]he condenser in the present application is a reflux condenser which is used for making chemicals in a lab. The condenser is not a general heat exchanger.” *Id.* at 12. This argument is unavailing.

The “field of endeavor” prong of the analogous art test asks if the structure and function of the prior art is such that it would be considered by a person of ordinary skill in the art because of the similarity to the structure and function of the claimed invention as disclosed in the application. *Bigio*, 381 F.3d at 1325–27. Regarding structure, the Examiner explains that “the instant invention as well as each and every one of the cited references are directed to the same type of heat exchanger (i.e. tube-in-tube heat exchangers) that include an inner tube disposed within an outer tube, thereby defining a space therebetween.” Ans. 8; *see also id.* at 6–8 (the Examiner explaining the structural similarities between the claimed invention and the

cited references). Regarding function, the Examiner explains that “condensing a gas to a liquid necessitates the exchange of heat from one medium to another medium.” *Id.* at 11; *see also* Spec. 1, ll. 1, 5–6 (titling the invention as “laboratory condensers with passive heat exchange” (capitalization omitted) and describing that condensing a gas to a liquid involves “reducing the temperature of the gas below its boiling point”). In this regard, Appellant does not contest the Examiner’s position. Given the similarity in the structure and function of Appellant’s disclosed invention and the cited references (i.e., each involving a tube-in-tube heat exchanger structure that functions to transfer heat from one medium to another), we are not persuaded by Appellant’s contention that the cited references and the claimed invention are in different fields of endeavor. Although we acknowledge that none of the cited references are explicitly described as a condenser, we are not persuaded that such a distinction overcomes the similarity of structure and function described above, especially where the reference to “condenser” appears only in the preamble of the claims. *See* Ans. 8–9. Consequently, Appellant does not apprise us of error in the Examiner’s conclusion that Steadman, Iida, Kleisle, and Lin are analogous art by virtue of satisfying the first prong of the analogous art test.

The references also satisfy the second prong of the analogous art test because the references are reasonably pertinent to a problem faced by Appellant. “A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem.” *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992).

Appellant argues that the problem with which the inventors were concerned was “exchanging heat *and* condensing gasses and vapours in an improved air-cooled laboratory gas condenser.” Appeal Br. 12 (emphasis added). Appellant asserts that “the problems faced by the cited references are a vehicle heater, a ste[a]m generator, a gas laser resonator, and an electronic component.” *Id.* According to Appellant, “the Examiner failed to show that the cited references . . . are reasonably pertinent to the entire problem faced by the inventor.” *Id.* at 12–13. In response, the Examiner takes the position that “the cited art in this case is indeed reasonably pertinent to appellant’s problem of ‘condensing gasses and vapors’ since condensing a gas to a liquid necessitates the exchange of heat from one medium to another medium.” Ans. 10–11. The Examiner also explains that

any heat exchange structures used in applications involving condensing a gas to a liquid would be instantly recognizable by one having ordinary skill in the art as used in other heat exchange applications such as those in which liquid is vaporized to a gas, or applications involving only gas-gas heat exchange, liquid-liquid heat exchange, or combinations thereof.

Id. at 11. In this regard, Appellant does not specifically address or persuasively refute the Examiner’s position.

Although the cited references do not specifically disclose condensing gasses and vapors, Appellant’s Specification describes that condensing requires “reducing the temperature of the gas below its boiling point.” Spec. 1, ll. 5–6. Appellant’s Specification also describes that,

by providing a liquid-filled sealed space, heat transfer from the inner tube to the outer tube can be improved without the need for directly mounting the outer tube on the inner tube; heat from vapours passing through the bore of the inner tube can then be removed through the inner tube, transferred to the outer tube then radiated away.

Id. at 2, ll. 23–27. In other words, the problem of condensing gas or vapor in a condenser directly involves heat exchange to reduce the temperature of the gas or vapor. Given that Steadman, Iida, Kleisle, and Lin involve heat exchanger subject matter, these references logically would have commended themselves to the inventor’s attention in considering Appellant’s asserted problem of exchanging heat and condensing gas and vapor in an air-cooled laboratory gas condenser. *Clay*, 966 F.2d at 659. Consequently, Appellant does not apprise us of error in the Examiner’s conclusion that Steadman, Iida, Kleisle, and Lin are analogous art by virtue of satisfying the second prong of the analogous art test.

For the foregoing reasons, Appellant does not apprise us of error in the Examiner’s conclusion of obviousness with respect to claim 1. Accordingly, we sustain the rejection of claim 1, and claims 2, 6–8, 10, 13, 17, 29, and 31 falling therewith, under 35 U.S.C. § 103(a) as unpatentable over Steadman, Iida, Kleisle, and Lin.

Rejections II–VII

In contesting the rejections of claims 3, 4, 9, 11, 12, 18, 30, and 32, Appellant relies on the arguments presented for patentability of independent claim 1. Appeal Br. 13. For the reasons discussed above, Appellant’s arguments do not apprise us of error in the rejection of claim 1, and likewise do not apprise us of error with respect to the rejections of claims 3, 4, 9, 11, 12, 18, 30, and 32. Accordingly, we sustain the rejections of claims 3, 4, 9, 11, 12, 18, 30, and 32 under 35 U.S.C. § 103(a).

CONCLUSION

In summary:

Claim(s) Rejected	35 U.S.C. §	References	Affirmed	Reversed
1, 2, 6–8, 10, 13, 17, 29, 31	103(a)	Steadman, Iida, Kleisle, Lin	1, 2, 6–8, 10, 13, 17, 29, 31	
3, 4	103(a)	Steadman, Iida, Kleisle, Lin, Matsuzaki	3, 4	
9, 30	103(a)	Steadman, Iida, Kleisle, Lin, Nitta	9, 30	
11	103(a)	Steadman, Iida, Kleisle, Lin, Allgäuer, Dankowski	11	
12	103(a)	Steadman, Iida, Kleisle, Lin, Mayo	12	
18	103(a)	Steadman, Iida, Kleisle, Lin, Matsuzaki, Kendall	18	
32	103(a)	Steadman, Iida, Kleisle, Lin, Kendall, Nitta, Allgäuer, Dankowski	32	
Overall Outcome			1–4, 6–13, 17, 18, 29–32	

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