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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GARY W. VAN TASSEL

Appeal 2011-001243
Application 11/222,750
Technology Center 3700

Before GAY ANN SPAHN, MICHAEL L. HOELTER, and BARRY L. GROSSMAN, *Administrative Patent Judges*.

SPAHN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Gary W. Van Tassel (Appellant) seeks our review under 35 U.S.C. § 134 of the Examiner's rejection of claims 17-36, 69, and 72-79. Appellant cancelled claims 1-16, 37-68, 70, and 71. Appellant presented arguments at oral hearing on January 15, 2013. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

The Claimed Subject Matter

The claimed subject matter relates to "a method of operating a marine liquefied natural gas (LNG) carrier in which LNG is carried in at least one tank." Spec. 1, para. [0002]. Claims 17 and 69 are independent and claim 17, reproduced below, with emphasis added, is illustrative of the subject matter on appeal.

> 17. A method of operating a marine liquefied natural gas (LNG) carrier in which LNG is carried in at least one tank, said method comprising:
>
> removing gas composed of evaporated LNG from a vapor space of the at least one tank;
>
> feeding a first portion of the gas to at least one gas consuming prime mover of the LNG carrier;
>
> increasing a pressure of a second portion of the gas;
>
> re-liquefying the second portion of the gas by heat exchange; and
>
> *feeding the re-liquefied second portion of the gas into the at least one tank in such a manner that some of the re-liquefied second portion of the gas evaporates as it is being fed into the at least one tank, whereby the vapor space of the at least one tank is cooled*.

Independent article of manufacture claim 69 is directed to a marine liquefied natural gas (LNG) carrier including, *inter alia*, "an arrangement for feeding the re-liquefied second portion of the gas into the at least one tank in such a manner that some of the re-liquefied second portion of the gas evaporates as it is being fed into the at least one tank, whereby the vapor space of the at least one tank is cooled."

The Rejections

The following Examiner's rejections are before us for review:

I. claims 17-36, 69, 78, and 79 under 35 U.S.C. § 102(b) as anticipated by Witt (US 3,885,394, issued May 27, 1975);

II. claims 17-31, 34, 69, 78, and 79 under 35 U.S.C. § 102(b) as anticipated by Jones (US 3,857,245, issued Dec. 31, 1974);

III. claim 73, 74, 76, 77 under 35 U.S.C. § 103(a) as unpatentable over Witt and Peereboom (US 3,815,540, issued Jun. 11, 1974);

IV. claim 73, 74, 76, 77 under 35 U.S.C. § 103(a) as unpatentable over Jones and Peereboom;

V. claims 72 and 75 under 35 U.S.C. § 103(a) as unpatentable over Witt and Massac (US 3,332,386, issued Jul. 25, 1967);

VI. claims 72 and 75 under 35 U.S.C. § 103(a) as unpatentable over Jones and Massac;

VII. claims 17-36, 69, 78, and 79 under 35 U.S.C. § 103(a) as unpatentable over Witt and Brizzolara (US 2,159,251, issued May 23, 1939);

VIII. claims 17-36, 69, 78, and 79 under 35 U.S.C. § 103(a) as being unpatentable over Jones and Brizzolara;

IX. claims 73, 74, 76, and 77 under 35 U.S.C. § 103(a) as unpatentable over Witt, Brizzolara, and Peereboom; and

X. claims 73, 74, 76, and 77 under 35 U.S.C. § 103(a) as unpatentable over Jones, Brizzolara, and Peereboom.

OPINION

Rejection I – Anticipation based on Witt

The Examiner finds that Witt discloses each and every limitation to anticipate independent claims 17 and 69. Ans. 3-4. In particular, the Examiner finds that Witt discloses the feeding step as emphasized in quoted claim 17 *supra*, because it is inherent that the re-liquefied gas evaporates to cool the vapor space as the re-liquefied gas is being fed back into the tanks 10. Ans. 4 and 26-27; *see also* Supp. Ans. 1[1].

Appellant argues that Witt is "silent regarding how the re-liquefied gas is being fed into the tank," and "[t]he most that can be said about the disclosure of . . . Witt . . . in this regard is that it discloses returning re-liquefied gas to a tank using a pump." App. Br. 9-10; see also 1st Reply Br. 7[2]. Appellant also argues that "[t]o the extent that the Examiner is relying on a theory of inherency to support his position . . . , [the Examiner] has not provided the required factual basis or technical reasoning to support that position." App. Br. 12; see also 1st Reply Br. 14-17 and 2nd Reply Br. 8-10[3]. In particular, Appellant asserts that "[t]he Examiner's inherency theory is not supported by the cited prior art," because Witt discloses a vapor space temperature of -150°C and pressure of approximately atmospheric or 1 atm (see col. 2, ll. 8-12) and a delivery pressure of 2 atmospheres absolute (col. 3, ll. 22-32). 2nd Reply Br. 9-10. According to Appellant, "the temperature

[1] All references to "Supp. Ans." are to the Supplemental Examiner's Answer mailed August 19, 2010.
[2] All references to "1st Reply Br." are to Appellant's "Reply Brief" filed June 8, 2010.
[3] All references to "2nd Reply Br." are to Appellant's "Supplemental Reply Brief" filed September 17, 2010.

of the re-liquefied natural gas as is being fed into the storage tank in . . . [Witt] . . . can be estimated to be essentially the same as the temperature of the vapor space of the LNG storage tank" based on the thermodynamic properties of LNG at 2 atm, both as a liquid and gas." 2nd Reply Br. 10.

We are persuaded by Appellant's arguments. Although Witt appears to be directed to a process and apparatus for dealing with boil off gas on a tanker that transports LNG in a manner that is similar to that of the present invention, Witt simply does not disclose in enough detail how the re-liquefied natural gas is being fed back into the tanks 10. More particularly, Witt has no express disclosure that the re-liquefied gas that is being put back into the tanks 10 is fed "in such a manner that some of the re-liquefied . . . gas evaporates as it is being fed into the . . . tank," and thereby cools the vapor space of the tank.

However, our inquiry does not end with Witt's express disclosure, because the Examiner finds it is inherent in Witt that re-liquefied gas evaporates as it is being fed back into the tanks 10. Ans. 4 and 26-27; Supp. Ans. 1. When relying on the theory of inherency, the Examiner has the initial burden of providing a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic reasonably flows from the teachings of the applied prior art. *See In re King*, 801 F.2d 1324, 1327 (Fed. Cir. 1986). Indeed, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

Here, the Examiner has not supported the inherency of Witt's gas evaporating as it is being fed back into the tanks 10 by adequate fact and/or

technical reasoning, because the Examiner has not shown by extrinsic evidence or otherwise that evaporation is necessarily present in Witt as the re-liquefied gas is being fed back into the tanks 10. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted) ("To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference.'"). More particularly, it is the Examiner's position that "the boil off vapor in the vapor space is warmer than the liquid and will directly mix and heat exchange with the liquid" so that "the liquid must inherently vaporize when directly heated by boil-off vapor." Ans. 26-27. However, the Examiner has not pointed to any extrinsic evidence tending to show that the re-liquefied gas is cooler than the vapor in the vapor space, while Appellant has provided technical reasoning why the re-liquefied gas being returned to the vapor space is at approximately the same temperature as the vapor in the vapor space.

Accordingly, we do not sustain the Examiner's rejection of independent claims 17 and 69, and claims 18-36, 78, and 79 dependent thereon, under 35 U.S.C. § 102(b) as anticipated by Witt.

Rejection II – Anticipation based on Jones

The Examiner finds that Jones discloses each and every limitation to anticipate independent claims 17 and 69. Ans. 8-9. In particular, the Examiner finds that Jones discloses the feeding step as emphasized in quoted claim 17 *supra*, because it is inherent that the re-liquefied gas evaporates to cool the vapor space as the re-liquefied gas is being fed back into the tanks 1. Ans. 9 and 26-27; *see also* Supp. Ans. 1

Similar to Appellant's arguments with respect to Witt *supra*, Appellant argues that Jones does not disclose how the re-liquefied gas is

being fed into the tank and the Examiner has not provided the required factual basis or technical reasoning to support the position that it is inherent that some of the re-liquefied gas evaporates to cool the vapor space as it is being fed back into the tank. App. Br. 11-13; *see also* 1st Reply Br 7 and 14-17, and 2nd Reply Br. 8-10.

Again, we are persuaded by Appellant's arguments. Appellant notes that Jones discloses that the re-liquefied gas is returned to the tank 1 at a temperature of 120°K (-153°C). 1st Reply Br. 15 (citing Jones, col. 3, l. 67). Further, Jones only discloses that "cold boil-off gas, at atmospheric pressure" is initially drawn from the vapor space. Jones, col. 3, ll. 34-37. Thus, there is no explicit disclosure that Jones's re-liquefied gas is cooler than the vapor space as is required to support the Examiner's inherency position. Thus, as the Examiner has not pointed to any extrinsic evidence tending to show that the re-liquefied gas of Jones is cooler than the vapor in the vapor space, the Examiner has not shown that evaporation is necessarily present in Jones as the re-liquefied gas is being fed back into the tanks 1 (*see Robertson* at 745), and the Examiner has not supported the inherency of Jones's gas evaporating as it is being fed back into the tanks 1 by adequate fact and/or technical reasoning.

Accordingly, we do not sustain the Examiner's rejection of independent claims 17 and 69, and claims 18-31, 34, 78, and 79 dependent thereon, under 35 U.S.C. § 102(b) as anticipated by Jones.

Rejections III-VI – Obviousness based on Witt/Peereboom, Jones/Peereboom, Witt/Massac, and Jones/Massac, respectively

The Examiner's rejections based upon the combinations of Witt/Peereboom, Jones/Peereboom, Witt/Massac, and Jones/Massac all rely on one of the erroneous findings that either of Witt or Jones inherently

discloses evaporation of the re-liquefied gas as it is being fed back to the tank in order to cool the vapor space. The Examiner does not rely on either Peereboom or Massac to cure the deficiency of Witt or Jones. Accordingly, for the same reasons as discussed *supra* with respect to anticipation based on either Witt or Jones, we do not sustain the Examiner's rejections, under 35 U.S.C. § 103(a), of: claim 73, 74, 76, 77 as unpatentable over Witt and Peereboom; claim 73, 74, 76, 77 as unpatentable over Jones and Peereboom; claims 72 and 75 as unpatentable over Witt and Massac; and claims 72 and 75 as unpatentable over Jones and Massac.

Rejections VII and VII – Obviousness based on Witt/Brizzolara and Jones/Brizzolara, respectively

The Examiner finds that either of Witt and Jones substantially discloses the subject matters of independent claims 17 and 69, but fails to disclose expanding the gas from the pressure provided by the compressor (24 at P=42 atm or 10) to the pressure maintained within the tanks (10 or 1) through the use of the nozzles alone (i.e., either Witt or Jones teaches an expansion value additionally to the nozzles. Ans. 17-18 (citing Witt, col. 3, ll. 15-20 and Jones, col. 3, ll. 60-65). To cure the deficiency of either Witt or Jones, the Examiner finds that "employing nozzles in lieu of expansion devices is old and well known in the art, for example, by Brizzolara (page 2, column 1, lines 15-20)" and "Brizzolara further teaches that the fluid [is] expanded from the pressure created by the compressor and is finely atomized." *Id*. The Examiner concludes that it would have been obvious to one of ordinary skill in the art to omit the expansion valve of either Witt or Jones and provide the nozzle of Brizzolara "for the purpose of improving

heat transfer between the re-liquefied natural gas and the boil off gas within the at least one tank." *Id*.

Appellant argues that the portion of Brizzolara relied upon by the Examiner (i.e., p. 2, col. 1, ll. 15-20) "teaches the expansion valves can be replaced by 'floats,' i.e., float valves, not by spray nozzles." App. Br. 16 (quoting Brizzolara, p. 2, col. l, ll. 18-24).

We are persuaded by Appellant's argument. Brizzolara is cited by the Examiner as an exemplary teaching that "employing nozzles in lieu of expansion devices is old and well known." Ans. 17-18. However, Brizzolara does not teach employing nozzles in lieu of expansion devices, but rather teaches "that the expansion valve may be omitted and that the usual high pressure and low pressure floats may be provided to serve as expansion valves." Brizzolara, p. 2, col. 1, ll. 18-21. In addition, the Examiner's notice of facts beyond the record, i.e., "employing nozzles in lieu of expansion devices is old and well known" is not capable of such instant and unquestionable demonstration as to defy dispute. *See In re Ahlert*, 424 F.2d 1088, 1091 (CCPA 1970). As such, the Examiner's modification of either Witt or Jones to omit the expansion valve and provide the nozzles of Brizzolara "for the purpose of improving heat transfer between the re-liquefied natural gas and the boil off gas within the . . . tank" does not appear to have a reason with a rational underpinning. *See KSR Int'l Co. v. Teleflex Inc*., 550 U.S. 398, 418 (2007) (holding that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.").

Accordingly, we do not sustain the Examiner's rejections, under 35 U.S.C. § 103(a), of: claims 17-36, 69, 78, and 79 as unpatentable over Witt and Brizzolara; and claims 17-36, 69, 78, and 79 as unpatentable over Jones and Brizzolara.

Rejections IX and X – Obviousness based on Witt/Brizzolara/Peereboom and Jones/Brizzolara/Peereboom, respectively

The Examiner's rejections based on the combination of Witt, Brizzolara, and Peereboom and Jones, Brizzolara, and Peereboom are based upon the erroneous finding that either it is well known or that Brizzolara teaches "employing nozzles in lieu of expansion valves." As Peereboom fails to cure the deficiency of either the combination of Witt and Brizzolara or the combination of Jones and Brizzolara, we do not sustain the Examiner's rejections, under 35 U.S.C. § 103(a), of: claims 73, 74, 76, and 77 as unpatentable over Witt, Brizzolara, and Peereboom; and claims 73, 74, 76, and 77 as unpatentable over Jones, Brizzolara, and Peereboom.

DECISION

We reverse the Examiner's decision to reject: claims 17-36, 69, 78, and 79 under 35 U.S.C. § 102(b) as anticipated by Witt; claims 17-31, 34, 69, 78, and 79 under 35 U.S.C. § 102(b) as anticipated by Jones; claim 73, 74, 76, 77 under 35 U.S.C. § 103(a) as unpatentable over Witt and Peereboom; claim 73, 74, 76, 77 under 35 U.S.C. § 103(a) as unpatentable over Jones and Peereboom; claims 72 and 75 under 35 U.S.C. § 103(a) as unpatentable over Witt and Massac; claims 72 and 75 under 35 U.S.C. § 103(a) as unpatentable over Jones and Massac; claims 17-36, 69, 78, and 79 under 35 U.S.C. § 103(a) as unpatentable over Witt and Brizzolara;

claims 17-36, 69, 78, and 79 under 35 U.S.C. § 103(a) as being unpatentable over Jones and Brizzolara; claims 73, 74, 76, and 77 under 35 U.S.C. § 103(a) as unpatentable over Witt, Brizzolara, and Peereboom; and claims 73, 74, 76, and 77 under 35 U.S.C. § 103(a) as unpatentable over Jones, Brizzolara, and Peereboom.

REVERSED

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