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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KEVIN M. RANKIN and PETER M. BALLARD

Appeal 2018-003079
Application 14/193,145
Technology Center 3700

Before STEFAN STAICOVICI, LEE L. STEPINA, and
ARTHUR M. PESLAK, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Kevin M. Rankin and Peter M. Ballard (“Appellants”)¹ appeal under 35 U.S.C. § 134(a) from the Examiner’s decision in the Final Office Action (dated Jan. 26, 2017, hereinafter “Final Act.”) rejecting claims 1, 3, 5–11, 21, and 23–30.² We have jurisdiction under 35 U.S.C. § 6(b).

¹ Hamilton Sundstrand Corporation is the applicant and is identified as the real party in interest in Appellants’ Appeal Brief 2 (filed June 23, 2017, hereinafter “Br.”).

² Claims 2, 4, 12–20, and 22 are canceled. Final Act. 2.

SUMMARY OF DECISION

We AFFIRM-IN-PART and enter NEW GROUNDS of REJECTION pursuant to our authority under 37 C.F.R. § 41.50(b).

INVENTION

Appellants' invention relates to "coating arrangements for various components of sliding actuator assemblies." Spec., para. 2.

Claims 1 and 21 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A coated pressure relief valve assembly comprising:
 - a pressure relief valve sleeve having a sleeve outer surface and a sleeve inner surface;
 - a pressure relief valve spool having a spool outer surface, wherein the sleeve and the spool are each formed of aluminum;
 - a hardened surface formed on the sleeve inner surface and the spool outer surface; and
 - a coating disposed on the hardened surface of at least one of the spool outer surface and the sleeve inner surface, the coating comprising a diamond-like carbon coating.

REJECTIONS

The following rejections are before us for review:

- I. The Examiner rejects claims 1, 3, 5, 6, and 8–11 under 35 U.S.C. §§ 102(a)(1) and (a)(2) as anticipated by Bailey et al. (US 2011/0042069 A1, pub. Feb. 24, 2011, hereinafter "Bailey") or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Bailey and Lavery (US 5,906,219, iss. May 25, 1999).

- II. The Examiner rejects claims 21, 23, 24, and 26–30 under 35 U.S.C. §§ 102(a)(1) and (a)(2) as anticipated by Bailey or, in the alternative, under 35 U.S.C. § 103 as unpatentable over Bailey and Kimpel (US 7,510,013 B2, iss. Mar. 31, 2009).
- III. The Examiner rejects claims 7 and 25 under 35 U.S.C. § 103(a) as unpatentable over Bailey and Hiroyuki et al. (JP 2005-061244 A, pub. Mar. 10, 2005, hereinafter “Hiroyuki”).³

ANALYSIS

Rejection I

The Anticipation Rejection

The Examiner finds that Bailey discloses a coated valve assembly including, *inter alia*, an aluminum sleeve and spool arrangement, as shown in Bailey’s Figure 10a, wherein the inner surface of the sleeve and the outer surface of the spool have a hardened surface and a diamond-like coating. *See* Final Act. 4 (citing Bailey, paras. 167, 168, 191, 232, 244, 245, 257).

Appellants argue that even though Bailey broadly relates to “applications related to oil and gas drilling,” Bailey does not disclose the “particular type of sleeve-spool valve assembly” claimed, namely, “a pressure relief valve (PRV) sleeve and pressure relief valve (PRV) spool.” Br. 9.

The Examiner responds that because the phrase “pressure relief” does not connote a particular structure, the phrase “pressure relief” is “directed to the intended use of the valve sleeve and spool.” Examiner’s Answer 8

³ The Examiner refers to JP 2005-061244 A by its publication number, whereas Appellants refer to it as “Nissan.” *See* Final Act. 8, Br. 8.

(dated Oct. 19, 2017, hereinafter “Ans.”). According to the Examiner, because Bailey’s valve structure “would be capable of providing ‘pressure relief’ simply by opening a closed valve to relieve pressure upstream of the valve,” one of ordinary skill in the art would consider that “Bailey’s valve sleeve and valve spool . . . [constitute] a pressure relief valve sleeve and a pressure relief valve spool.” *Id.*

We do not agree with the Examiner’s position that the phrase “pressure relief” in independent claim 1 is directed to an intended use of the claimed valve. Rather, we construe the phrase “pressure relief” to limit the claimed valve to a specific type of valve, namely, a “pressure relief valve,” which “opens *automatically* when the pressure reaches a dangerous level.”⁴

Although Bailey’s disclosure refers to various types of valve devices, such as, a “check valve, gate valve, globe valve, ball valve, needle valve, and plug valve,” Bailey does not disclose a “pressure relief valve,” as described *supra*. Bailey, para. 147. The Examiner’s position that any of Bailey’s valve devices constitutes a “pressure relief valve” merely because it can be “open[ed] . . . to relieve pressure upstream of the valve” does not take into account the particularity of a “pressure relief valve” in that it must open *automatically* to vent excess pressure. Stated differently, although we appreciate that the valves of Bailey may provide pressure relief when opened, that does not mean that they constitute a “pressure relief valve,” as called for by claim 1, as they do not *automatically* vent excess pressure.

⁴ See <https://www.thefreedictionary.com/relief+valve> (last visited November 16, 2018) (emphasis added); see also Lavery, col. 2, ll. 44–45 (“A pressure relief valve vents excess pressure using a normally closed valve.”).

Accordingly, as Bailey does not disclose a “pressure relief valve,” as called for by independent claim 1, we do not sustain the anticipation rejection of claims 1, 3, 5, 6, and 8–11 based upon Bailey.

The Obviousness Rejection

Appellants do not present arguments for the patentability of claims 3, 5, 6, and 8–11 apart from claim 1. 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 3, 5, 6, and 8–11 standing or falling with claim 1.

The Examiner finds that Bailey discloses most of the limitations of independent claim 1, but fails to disclose a “pressure relief valve.” Final Act. 4–5. The Examiner then finds that Lavery discloses “a pressure relief valve having a spool (28) in a sleeve (12), as known to be used in oil and gas applications.” *Id.* at 6 (citing Lavery, col. 1, ll. 31–35)⁵. Thus, the Examiner concludes that “[i]t would have been obvious to one having ordinary skill in the art to modify the invention of Bailey, such that the valve was a pressure relief valve, as taught by Lavery, to be known to be valves used in oil and gas applications such as Baileys.” *Id.*

Appellants argue that Bailey disparages using aluminum in the Background section, and, therefore, Bailey teaches away from using aluminum to form the sleeve and spool of its valve arrangement. Br. 9–10 (citing Bailey, para. 9). Appellants further assert that Bailey’s disclosure of

⁵ This citation from Lavery does not support the Examiner’s findings. However, column 3, lines 21–36 supports a pressure relief valve having a sleeve 12 and a spool 28.

Al-base alloys in paragraph 232 pertains to “general components,” and “is not definitively disclosing that a sleeve and a spool are formed of aluminum.” *Id.* at 10. According to Appellants, Bailey’s single vague statement does not outweigh Bailey’s “significant disparaging of aluminum.” *Id.*

We are not persuaded by Appellants’ arguments because Bailey does not “criticize, discredit or otherwise discourage”⁶ making the sleeve and the spool of a valve device from aluminum in conjunction with hardened and coated surfaces that reduce wear and friction. *See* Final Act. 4–5 (citing Bailey, paras. 167, 168, 232, 244–259, 257). Paragraph 9 of Bailey, which Appellants rely on, refers to a method of reducing friction between a sliding sleeve and spool arrangement, of a valve device, by using aluminum to make the sleeve and spool components. Bailey does not mention any drawbacks from making the sleeve and spool of a valve device from aluminum in conjunction with hardened and coated surfaces that reduce wear and friction between contacting surfaces.

Hence, although Bailey discusses the drawbacks encountered in making the sleeve and spool components from aluminum, Appellants’ argument ignores that Bailey discloses how to overcome these drawbacks, namely, by providing hardened and coated surfaces to the sleeve and spool surfaces that come into contact, and, thus, reducing wear and friction. Moreover, Bailey specifically discloses that a “*coated* sleeved oil and gas well production device may be fabricated from . . . Al-base alloys.” Bailey, para. 232 (emphasis added). Such disclosure would not have led a person of ordinary skill away from the proposed modification; rather, such disclosure

⁶ *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

would have been instructive. *See W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1550 (Fed. Cir. 1983) (A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention). Accordingly, we do not agree with Appellants that Bailey teaches away from making the coated sleeve and spool of the pressure relief valve of Bailey, as modified by Lavery, from aluminum.

Furthermore, the phrase “coated sleeve device” in Bailey’s paragraph 189 does not refer to “general components,” as Appellants allege, but refers to particular components disclosed by Bailey such as, “[c]hokes, valves, valve seats, seals, ball valves, inflow control devices, smart well valves, and annular isolation.” *Id.*, para. 191. As the Examiner’s rejection is based on the combined teachings of Bailey and Lavery, a “pressure relief valve” is a particular “coated sleeve device” that may be fabricated from Al-base alloys. Hence, the Al-based alloy would apply to both the sleeve material and the spool material of the pressure relief valve of Bailey, as modified by Lavery.

Lastly, although we appreciate that Bailey does not disclose a “pressure relief valve,” nonetheless, as noted above, Lavery discloses such a feature. *See* Final Act. 5–6. Appellants do not persuasively show error in the Examiner’s findings or identify any flaw in the Examiner’s reasoning in combining the disclosures of Bailey and Lavery. *See* Br. 10.

In conclusion, for the foregoing reasons, we sustain the rejection of claim 1 under 35 U.S.C. § 103 as unpatentable over Bailey and Lavery. Claims 3, 5, 6, and 8–11 fall with claim 1.

Rejection II

The Anticipation Rejection

The Examiner finds that Bailey discloses a coated valve assembly including, *inter alia*, an aluminum sleeve and spool arrangement, as shown in Bailey's Figure 10a, wherein the inner surface of the sleeve and the outer surface of the spool have a hardened surface and a diamond-like coating. See Final Act. 6–7 (citing Bailey, paras. 167, 168, 191, 232, 244, 245, 257). The Examiner further finds that because the phrase “fuel control metering” does not connote a particular structure, the phrase “fuel control metering” is “considered intended use limitations of the valve.” *Id.* at 8.

Appellants argue that even though Bailey broadly relates to “applications related to oil and gas drilling,” Bailey does not disclose the “particular type of sleeve-spool valve assembly” claimed, namely, “a fuel control metering valve sleeve and a fuel control metering valve spool.” Br. 9.

We do not agree with the Examiner's position that the phrase “fuel control metering” in independent claim 21 is directed to an intended use of the claimed valve. Rather, we construe the phrase “fuel control metering” to limit the claimed valve to a specific type of valve, namely, a “fuel control metering valve,” which is a valve that controls fuel flow by incrementally shifting in a stepped manner between open and closed positions.⁷

⁷ See Kimpel, col. 1, ll. 12–13, 16–18, Abstract; *see also* http://www.solidswiki.com/index.php?title=Metering_Valves (last visited November 16, 2018) (A metering valve “is a valve with infinite positioning and variable control that is capable of regulating the flow of fluid. A needle valve is a type of metering valve.”).

Although Bailey discloses that there are many type of valve devices, such as, a “check valve, gate valve, globe valve, ball valve, needle valve, and plug valve,” Bailey does not explicitly disclose a “metering valve,” as described *supra*. Bailey, para. 147. The Examiner’s position that any of Bailey’s valve devices constitutes a “metering valve” does not take into account the particularity of a “metering valve” in that it incrementally shifts in a stepped manner between open and closed positions.

Nonetheless, we note that Bailey discloses a “needle valve.” Bailey, para. 147. As an artisan must be presumed to know something about the art apart from what the references disclose, a person of ordinary skill in the art of valves would have readily understood that a needle valve is a type of metering valve. *See In re Jacoby*, 309 F.2d 513, 516 (CCPA 1962).

Accordingly, Bailey’s “needle valve” device constitutes a fuel control “metering valve” that includes a fuel control metering valve sleeve and a fuel control metering valve spool. Therefore, for the foregoing reasons, we sustain the anticipation rejection of claims 21, 23, 24, and 26–30 based upon Bailey.

However, we denominate our affirmance as a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b), because our analysis relies upon facts and reasoning that the Examiner did not use.

The Obviousness Rejection

Appellants have not presented arguments for the patentability of claims 23, 24, and 26–30 apart from claim 21. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 21 as the representative

claim to decide the appeal of the rejection of these claims, with claims 23, 24, and 26–30 standing or falling with claim 1.

The Examiner finds that Bailey discloses most of the limitations of independent claim 21, but fails to disclose a fuel control “metering valve.” Final Act. 6–8. The Examiner then finds that Kimpel discloses “a fuel control metering valve having a spool (22) in a sleeve (20) as known to be used in downhole tools used in oil and gas applications.” *Id.* at 8 (citing Kimpel, Background of the Invention). Thus, the Examiner concludes that “[i]t would have been obvious to one having ordinary skill in the art to modify the invention of Bailey, such that the valve was a fuel control metering valve, as taught by Kimpel, to be known to be valves used in oil and gas applications such as Baileys.” *Id.*

Appellants once more argue that because Bailey disparages using aluminum in the Background section, Bailey teaches away from using aluminum to form the sleeve and spool of its valve arrangement. Br. 9–10 (citing Bailey, para. 9). Appellants further argue that Bailey does not disclose a fuel control “metering valve.” *Id.* at 11.

We are not persuaded by Appellants’ arguments for the same reasons discussed *supra* in Rejection I. Appellants do not persuasively show error in the Examiner’s findings or identify any flaw in the Examiner’s reasoning in combining the disclosures of Bailey and Kimpel.

Accordingly, we sustain the rejection of claims 21, 23, 24, and 26–30 under 35 U.S.C. § 103 as unpatentable over Bailey and Kimpel.

Rejection III

In regards to the rejection of claim 7, the Examiner's reliance on the disclosure of Hiroyuki does not remedy the deficiency of Bailey discussed *supra* in the anticipation rejection based upon Bailey in Rejection I. *See* Final Act. 8–9. Accordingly, we do not sustain the rejection of claim 7 over the combined teachings of Bailey and Hiroyuki.

As to the rejection of claim 25, Appellants rely on the same arguments discussed *supra* in the anticipation rejection based upon Bailey in Rejection II. *See* Br. 11. Hence, for the same reasons, we sustain the rejection under 35 U.S.C. § 103(a) of claim 25 as unpatentable over Bailey and Hiroyuki.

However, as claim 25 depends from independent claim 21, we denominate our affirmance as a NEW GROUND OF REJECTION pursuant to 37 C.F.R. § 41.50(b), because our analysis relies upon facts and reasoning that the Examiner did not use.

NEW GROUND OF REJECTION

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bailey, Lavery, and Hiroyuki.

We adopt the Examiner's findings and reasoning with respect to the combination of Bailey and Lavery. *See* Final Act. 4–6.⁸ However, the combined teachings of Bailey and Lavery do not disclose a hardened surface having a surface roughness “of less than or equal to about 0.000004 inches,”

⁸ We do not adopt the Examiner's construction of the phrase “pressure relief.” *See* Final Act. 5.

as called for by claim 7. Hiroyuki⁹ discloses a hardened surface of an aluminum base material having a surface roughness of less than or equal to about 0.000001 inches (0.03 microns). Hiroyuki, para. 12. As such, it would have been obvious for a person of ordinary skill in the art to provide Hiroyuki's surface roughness of less than or equal to about 0.000001 inches to the hardened aluminum surface of Bailey, as modified by Lavery, in order to prevent inducing a crack in a coating applied thereto. *See id.*

DECISION

The Examiner's decision to reject claims 1, 3, 5, 6, and 8–11 under 35 U.S.C. § 102 as anticipated by Bailey is reversed.

The Examiner's decision to reject claims 1, 3, 5, 6, and 8–11 under 35 U.S.C. § 103 as unpatentable over Bailey and Lavery is affirmed.

The Examiner's decision to reject claims 21, 23, 24, and 26–30 under 35 U.S.C. §§ 102 and 103 is affirmed.

The Examiner's decision to reject claim 7 under 35 U.S.C. § 103 as unpatentable over Bailey and Hiroyuki is reversed.

The Examiner's decision to reject claim 25 under 35 U.S.C. § 103 as unpatentable over Bailey and Hiroyuki is affirmed.

For the reasons discussed above, we denominate our affirmance of the rejection of claims 21, 23, 24, and 26–30 under 35 U.S.C. § 102 and the rejection of claim 25 under 35 U.S.C. § 103 as new grounds of rejection pursuant to 37 C.F.R. § 41.50(b).

⁹ We derive our understanding of this reference from the English language translation contained in the electronic record of this application. All references to the text of this document are to portions of the translation.

We enter a new ground of rejection of claim 7 under 35 U.S.C. § 103(a) as unpatentable over Bailey, Lavery, and Hiroyuki.

This decision contains new grounds of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

Section 41.50(b) also provides:

When the Board enters such a non-final decision, the appellant, within two months from the date of the decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the [E]xaminer, in which event the prosecution will be remanded to the [E]xaminer. The new ground of rejection is binding upon the examiner unless an amendment or new Evidence not previously of Record is made which, in the opinion of the [E]xaminer, overcomes the new ground of rejection designated in the decision. Should the [E]xaminer reject the claims, appellant may again appeal to the Board pursuant to this subpart.

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. The request for rehearing must address any new ground of rejection and state with particularity the points believed to have been misapprehended or overlooked in entering the new ground of rejection and also state all other grounds upon which rehearing is sought.

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

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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)(1)(iv).

AFFIRMED-IN-PART; 37 C.F.R. § 41.50(b)