

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LEGGETT & PLATT, INC.,
Petitioner,

v.

DREAMWELL, LTD.,
Patent Owner.

IPR2015-01757
Patent 8,919,752

Before MEREDITH C. PETRAVICK, MICHAEL J. FITZPATRICK, and
BARRY L. GROSSMAN, *Administrative Patent Judges*.

PETRAVICK, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Leggett & Platt, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–9 of U.S. Patent No. 8,919,752 (Ex. 1001, “the ‘752 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 2 (“Pet.”).

Dreamwell, Ltd. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”).

We have jurisdiction under 35 U.S.C. § 314(a) and 37 C.F.R. § 42.4(a). Pursuant to § 314(a) an *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

For the reasons described below, we determine that Petitioner fails to demonstrate that there is a reasonable likelihood that it would prevail with respect to at least one of the challenged claims. Accordingly, we do not institute an *inter partes* review.

B. Related Proceedings

The ’752 patent claims priority as a continuation of U.S. Patent No. 8,474,805 (“the ’805 patent”). The ’805 patent is the subject of proceeding IPR2015-01753. A decision denying institution of *inter partes* review in IP2015-01753 is entered concurrently with our Decision in this proceeding.

C. The ’752 Patent

The ’752 patent is titled “Microalloyed Spring” and issued on December 30, 2014 from an application filed on June 13, 2013. Ex. 1001, [22], [45]. The ’752 patent is a continuation of the ’805 patent, which issued from an application filed on April 18, 2008. *Id.* at [63].

The ’752 patent discloses an innerspring assembly for use in cushioning articles such as mattresses. *Id.* at 1:52–54. The innerspring assembly has an innerspring core that is stronger and more durable than

conventional innerspring cores while keeping the weight and size to a minimum. *See id.* at 1:46–48. The innerspring core is made of coil springs made from a high-carbon steel wire alloyed with one or more suitable alloying elements such as titanium and copper, so that they impart greater strength and durability to the innerspring core. *Id.* at 1:56–60.

The '752 patent has one independent claim and eight dependent claims. Claim 1, reproduced below, is illustrative of the claims of the '752 patent.

1. A coil spring in an innerspring assembly in a cushioning article, comprising
a high-carbon steel wire coiled into a helical spring and alloyed with an alloying element wherein the high carbon steel wire includes carbon that is from about 0.50 to about 0.99 weight percent of the spring, wherein the high carbon steel wire has a diameter of 0.04 to 0.11 inches (1.016 to 2.794 millimeters);
wherein the alloying element comprises titanium ranging from 0.001 to about 0.1 weight percent of the spring and silicon ranging from 0.001 to less than 0.55 weight percent of the spring, and wherein a total amount of the alloying element is from about 0.001 to about 2 weight percent of the spring.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following ground of unpatentability:

Ground	Claims	Prior Art
§ 103	1–9	Gladney ¹ , Kochi ² , and Magrab ³

¹ U.S. Patent No. 7,168,117 (issued Jan. 30, 2007) (Ex. 1003).

² U.S. Patent Pub. No. 2007/0277913 A1 (published Dec. 6, 2007) (Ex. 1004).

³ Edward B. Magrab, *Integrated Product and Process Design and Development: The Product Realization Process* (1997) (Ex. 1005).

Petitioner proffers a Declaration of Dr. Ronald O'Malley to support its analysis regarding patentability in the Petition. Ex. 1002 ("O'Malley Decl.").

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, the Board interprets claim terms in an unexpired patent according to the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278–79 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 84 U.S.L.W. 3218 (U.S. Jan. 15, 2016) (No. 15-446). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as they would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner proposes a construction for "high-carbon steel." Pet. 21. We, however, determine that an explicit construction of "high-carbon steel" or any other claim term is not necessary for the purposes of our Decision.

B. Ground of Unpatentability

Petitioner contends that claims 1–9 would have been obvious to one of ordinary skill in the art over Gladney, Kochi, and Magrab. Pet. 22–47.

Section 103(a) forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

a person having ordinary skill in the art to which said subject matter pertains.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *see KSR*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).⁴

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Products, Inc. v. Solid State Systems Corp.*, 755 F. 2d 158 (Fed. Cir. 1985) (“It is elementary that the claimed invention must be considered as a *whole* in deciding the question of obviousness.”); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) (“the question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious.”).

⁴ Additionally, secondary considerations such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Graham*, 383 U.S. at 17–18. The current record, however, lacks such evidence.

A determination of obviousness cannot be based on mere conclusory statements; “instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Against this general background, we consider the references, other evidence, and arguments on which the parties rely.

i. Overview of Prior Art

a. Gladney

Gladney is a U.S. patent titled “Multi-Stranded Coil Spring.” Ex. 1003, [54]. Gladney discloses a multi-stranded coil spring for a mattress. *Id.* at 1:16–26. The strands of the multi-stranded coil spring may be made from solid steel wire, carbon steel, spring steels, plastics, and/or other materials. *Id.* at 2:12–15, 5:1–3, 5:36–39, 6:58–67. Gladney states that “[m]aterial selection may be based on a number of factors, including temperature range, tensile strength, elastic modulus, fatigue life, corrosion resistance, cost, etc.” *Id.* at 4:64–5:1.

High-carbon spring steels are the most commonly used of all spring materials. They are relatively inexpensive, readily available, and easily worked. Examples include Music (ASTM A228) wire and Hard Drawn (ASTM A227) wire, which are suitable for springs used, for example, in mattresses. *Id.* at 5:1–5:6; *see also id.* at 1:50–59 (discussing that disadvantages of conventional springs is that they are costly to manufacture).

b. Kochi

Kochi is a U.S. patent titled “Wire Rod Excellent in Wire-drawing Workability and Method for Producing the Same.” Ex. 1004 [54]. Kochi describes a wire rod with excellent wire-drawing workability that can be used to produce steel cord, beading wire, PC steel wire, or spring steel. *Id.* ¶ 1. The wire rod is made from carbon steel composed of various elements of various amounts. Kochi’s pertinent disclosures are shown in the chart below in association with the corresponding elements of claim 1.

Claimed Element	Claimed Amount	Kochi’s Amount of Element
Carbon (“C”)	about 0.50 to about 0.99 weight percent of the spring	“not less than 0.6% C” “upper limit of . . . 1.1%” “preferably in a range of 0.8% to 1.0%” Ex. 1004 ¶ 18.
Titanium (“Ti”)	ranging from 0.001 to about 0.1 weight percent of the spring	“preferable lower limit of Ti content is 0.0010%” “an upper limit of the Ti content is set to 0.1%” “[t]he upper limit thereof is preferably not more than 0.08%” <i>Id.</i> ¶ 31.
Silicon (“Si”)	ranging from 0.001 to less than 0.55 weight percent of the spring	“addition of not less than 0.1% Si” “an upper limit of silicon content is set to 2.0%” “preferably in a range of 0.15 to 1.8%” <i>Id.</i> ¶ 19.

Kochi discloses that its wire rod is “excellent in wire-drawing workability, insusceptible to wire break in spite of an increase in wire-drawing rate, and reduction of area, and capable of extending a die life by suppressing die wear.” *Id.* ¶ 6.

c. Magrab

Magrab is a book titled “Integrated Product and Process Design and Development: The Product Realization Process” and generally discloses material selection for a product takes into account a multitude of factors, including cost of raw materials. Ex. 1005, 155–156, Table 8-1 (listing many factors for material selection). With regards to plain carbon steels, Magrab states that “[c]arbon steels contain up to 2% total alloying elements” and that “[h]igh-carbon steels contain from 0.6% to 1.0% carbon and are used to form spring materials.” *Id.* at 161–162.

ii. Claim 1

Petitioner contends that claim 1 would have been obvious to one of ordinary skill in the art over Gladney, Kochi, and Magrab. Pet. 27–40. In support of that contention, Petitioner alleges: that Gladney discloses “that high-carbon steel is commonly used for helical springs in cushioning articles” (*id.* at 13); that Kochi discloses “a high-carbon steel spring comprising the same combination of alloying elements as claimed in the ’752 Patent” (*id.*); and that Magrab discloses that “for high carbon steel springs, the ‘total alloying elements’ concentration should be ‘up to 2% total.’” (*id.*). Petitioner concludes that “the features recited in the challenged

claims of the '752 Patent were well-known and therefore are unpatentable.” *Id.* at 15.

Petitioner alleges that the claimed alloyed high-carbon steel is taught by the combination of Kochi and Magrab. *Id.* at 30–40. Petitioner argues that it would have been obvious to one of ordinary skill in the art to modify the high-carbon spring steel spring of Gladney to be made from the alloyed high-carbon steel taught by the combination of Kochi and Magrab for two reasons.

First, Petitioner argues that one of ordinary skill in the art would make the proposed modification because the prior art teaches that high-carbon steel is a well-known inexpensive material that is suitable for springs. Pet. 31, 38–40. Patent Owner responds that, although the prior art generally teaches that springs are made from high-carbon spring steels and that it is desirable to lower material cost, none of the prior art references teaches that the claimed alloyed high-carbon steel is inexpensive or suitable for springs. Prelim. Resp. 12–18. Patent Owner alleges that, contrary to Petitioner’s allegations, the claimed alloyed high-carbon steel is more expensive than basic non-alloyed steel springs. *Id.* at 17.

The evidence of record does not establish sufficiently that the prior art alloyed high-carbon steel is an inexpensive material suitable for springs of a mattress or other cushioning article. Gladney’s general disclosure that springs made from high-carbon spring steels are inexpensive (*see* Ex. 1003, 5:1–3), fails to establish sufficiently that the prior art alloyed high-carbon steel is inexpensive or suitable for springs of a mattress or cushioning article. Likewise, Magrab’s general disclosures that high-carbon steel is inexpensive and used for springs (*see* Ex. 1005, 155, 161–162) and Kochi’s brief

mention of “spring steel” (Ex. 1004 ¶ 1) does not demonstrate such. Dr. O’Malley’s testimony also does not cure the deficiencies of the prior art because Dr. O’Malley discusses cost with regards to carbon steel generally, but not the cost of the prior art alloyed high-carbon steel. See Ex. 1002 ¶¶ 68, 85.

We also acknowledge that Gladney and Magrab disclose that the cost of materials is a factor to be considered when choosing an alloy. Pet. 38 (citing Ex. 1003, 1005). Such disclosure, however, does not demonstrate that claim 1 would have been obvious based on Gladney, Kochi, and Magrab. And Petitioner’s reliance on *Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*, 464 F.3d 1356, 1368 (Fed. Cir. 2006) does not persuade us otherwise. In *Dystar*, decided prior to *KSR*, the Federal Circuit emphasized a flexible approach to considering whether an invention would have been obvious. *DyStar*, 464 F.3d at 1367 (“It is difficult to see how our suggestion test could be seen as rigid and categorical given the myriad cases over several decades in which panels of this court have applied the suggestion test flexibly.”). As noted by the Court, “[o]bviousness is a complicated subject requiring sophisticated analysis, and no single case lays out all facets of the legal test.” *Id.* Moreover, as discussed above, there is no persuasive evidence that the alloyed high-carbon steel spring recited in the claim is less expensive or more efficient than prior art springs. See Prelim. Resp. 17 (pointing out there is no “list of materials costs or any manufacturing cost analysis that would substantiate Petitioner’s statement in the context of combining Gladney with Kochi with Magrab to allegedly come up with the claimed invention.”).

The evidence of record fails to demonstrate, sufficiently, that the prior art alloyed high-carbon steel is an inexpensive material suitable for a spring for a mattress or cushioning articles and, thus, Petitioner fails to establish that one of ordinary skill in the art would make the proposed modification because the alloyed high-carbon steel required by claim 1 is a well-known inexpensive material that is suitable for springs.

Second, Petitioner argues that it would have been obvious to one of ordinary skill in the art to modify the high-carbon spring steel spring of Gladney to be made from the particular alloyed high-carbon steel taught by Kochi because Kochi discloses that its material has certain desirable characteristics making it suitable for wire-drawing processing. Pet. 31. Kochi discloses that its material is “excellent in wire-drawing workability, insusceptible to wire break in spite of an increase in wire-drawing rate, and reduction of area, and capable of extending a die life by suppressing die wear.” Ex. 1004 ¶ 6. Petitioner argues and Dr. O’Malley testifies that “a person of ordinary skill in the art reading Kochi would have recognized that because the wire is ‘insusceptible to wire break,’ a spring that is formed from the wire would also be less susceptible to breakage.” Pet. 31; Ex. 1002 ¶ 68.

Patent Owner disputes that it would have been obvious to one of ordinary skill in the art to make the proposed modification based upon Kochi’s disclosure of desirable characteristics for wire-drawing processing. Prelim. Resp. 15–16. According to Patent Owner, “Gladney discloses nothing about a ‘wire drawing process,’ while Kochi’s disclosure bears no relation to the design of mattress springs.” *Id.* at 15.

The evidence of record does not establish sufficiently it would have been obvious to one of ordinary skill in the art to make the proposed modification. Although Kochi mentions that its wire rod could be used to make a drawn wire product, such as spring steel (Ex. 1004 ¶ 1), Kochi does not teach that its high-carbon steel would be suitable for springs for a mattress or cushioning article. Likewise, although Gladney discloses that high-carbon spring steels, such as Hard Drawn (ATM A227) wire are used to make springs (Ex. 1003, 5:1–6), Gladney does not teach that the particular high-carbon steel disclosed in Kochi would be suitable for a spring for mattresses or cushioning articles. Further, we are not persuaded by Dr. O'Malley's testimony that one of ordinary skill in would know that because the wire is insusceptible to wire break during a wire drawing process that a spring that is formed from the wire would also be less susceptible to breakage. Ex. 1002 ¶ 68. Dr. O'Malley provides no explanation or evidence to support this conclusory assertion. *Id.* Office Patent Trial Practice Guide, 77 Fed. Reg. 48, 756, 48,763 (“Affidavits expressing an opinion of an expert must disclose the underlying facts or data upon which the opinion is based.”).

The evidence of record fails to demonstrate, sufficiently, that the prior art alloyed high-carbon steel is suitable for a spring for mattresses or cushioning articles and, thus, Petitioner fails to establish that one of ordinary skill in the art would make the proposed modification because the alloyed high-carbon steel required by claim 1 is susceptible to breakage.

Absent other evidence or another articulated rationale with logical underpinning, combining Gladney, Kochi, and Magrab to arrive at the a spring for a cushioning article made from the specifically claimed alloy of

high-carbon steel appears to be improper hindsight. “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *See KSR*, 550 U.S. at 421. Petitioner fails to establish a sufficient articulated reasoning with some rational underpinning to support the legal conclusion of obviousness (*In re Kahn*, 441 F.3d at 988) and, thus, fails to demonstrate a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition.

iii. Dependent Claims 2–9

Claims 2–9 depend from claim 1, and, like for claim 1, Petitioner contends that claims 2–9 are unpatentable over Gladney, Kochi, and Magrab (Pet. 40–47). For the same reasons as discussed above, we determine that Petitioner fails to demonstrate a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition.

C. Availability of Magrab as Prior Art

Patent Owner argues that Petitioner fails to establish that Magrab was publically accessible prior to April 18, 2008. Prelim. Resp. 34–36. As discussed above, we determine that Petitioner fails to demonstrate that claims 1–9 are unpatentable over Gladney, Kochi, and Magrab and, thus, we need not address whether Petitioner has established sufficiently that Magrab is prior art for the purposes of our Decision.

III. CONCLUSION

We determine that Petitioner fails to demonstrate a reasonable likelihood of prevailing on at least one of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '752 patent is DENIED.

IPR2015-01757
Patent 8,919,752 B2

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