

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LEGGETT & PLATT, INC.,
Petitioner,

v.

DREAMWELL, LTD.,
Patent Owner.

IPR2015-01753
Patent 8,474,805

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

GROSSMAN, *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 1–20 of U.S. Patent No. 8,474,805 (Ex. 1001, “the ’805 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 one 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 ’805 patent is the parent of U.S. Patent No. 8,919,752 (“the ’752 patent”). The ’752 patent is a continuation of and claims priority to the ’805 patent. The ’752 patent is the subject of proceeding IPR2015-01757. A decision denying institution of *inter partes* review in IP2015-01757 is entered concurrently with our Decision in this proceeding.

C. The ’805 Patent

The ’805 patent is titled “Microalloyed Spring” and issued on July 2, 2013 from an application filed on April 18, 2008. Ex. 1001, 1.

The '805 patent discloses an innerspring assembly for use in “cushioning articles,” such as mattresses. *Id.* at 1:45–47. 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. *Id.* at 1:49–53. The stated purpose of the alloying elements is to impart “greater strength and durability to the innerspring core.” *Id.*

The '805 patent has three independent claims and 17 dependent claims. Independent claims 1, 11, and 18, reproduced below, are illustrative of the claims in the '805 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.

11. A coil spring in an innerspring assembly in a cushioning article, comprising

a carbon steel wire coiled into a helical spring and alloyed with an alloying element, wherein the high carbon steel wire has a diameter of 0.04 to 0.11 inches (1.016 to 2.794 millimeters); wherein the carbon is from about 0.50 to about 0.99 weight percent of the spring and the alloying element comprises titanium, silicon, and copper, the titanium ranging from 0.001 to about 0.01 weight percent of the spring, the silicon ranging from 0.001 to less than 0.55 weight percent of the spring, and the copper ranging from 0.1 to about 0.3 weight percent of the

spring, and wherein a total amount of the alloying element is from 0.001 to 2 weight percent of the spring.

18. A coil spring in an innerspring assembly in a cushioning article, comprising a carbon steel wire coiled into a helical spring and alloyed with an alloying element, wherein the high carbon steel wire has a diameter of 0.04 to 0.11 inches (1.016 to 2.794 millimeters); wherein the carbon is from about 0.50 to about 0.99 weight percent of the spring and the alloying element comprises titanium, aluminum, and copper, the titanium ranging from 0.001 to about 0.01 weight percent of the spring, the aluminum that is about 0.003 weight percent of the spring, and the copper ranging from 0.1 to about 0.3 weight percent of the spring, and wherein a total amount of the alloying element is from 0.001 to 2 weight percent of the spring.

Claim 11 differs from claim 1 in the range of titanium claimed. Claim 11 requires titanium ranging from “0.001 to about 0.01 weight percent of the spring,” whereas claim 1 requires titanium ranging from “0.001 to about 0.1 weight percent of the spring.”

Claim 18 differs from claim 11 in substituting aluminum for silicon in the alloying element. Claim 18 requires the alloying element to comprise titanium, aluminum (“about 0.003 weight percent of the spring”), and copper, whereas claim 11 requires the alloying element to comprise titanium, silicon (“ranging from 0.001 to less than 0.55 weight percent of the spring”), and copper.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Ground	Claims	Prior Art
§ 103	1–20	Gladney ¹ , Kochi ² , and Magrab ³

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

When interpreting a claim, words of the claim are generally given their ordinary and accustomed meaning, unless it appears from the specification, the file history, or other evidence asserted by the parties that the inventor used them differently. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Id.*

Petitioner proposes a construction for “high-carbon steel.” Pet. 20–21. 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.

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

² US Patent App. No. 2007/0277913 (published Dec. 6, 2007) (Ex. 1004).

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

B. Ground of Unpatentability

Petitioner contends that claims 1–20 would have been obvious to one of ordinary skill in the art over Gladney, Kochi, and Magrab. Pet. 22–59.

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.”) (citation omitted); *see also Stratoflex, Inc. v. Aeroquip Corp.*,

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.

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.”) (citation omitted).

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) (citation omitted).

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 discloses a multi-stranded coil spring for a mattress. Ex. 1003, 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, and 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 spring used, for example, in mattresses.

Id. at 5:1–5:5; *see also id.* at 1:50–59 (discussing that disadvantages of conventional spring is that they are costly to manufacture).

b. Kochi

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. Ex. 1004 ¶ 1. The wire rod is made from carbon steel composed of various elements of various amounts. Kochi provides an extensive menu of various alloying elements and the benefits and detriments of each element. Kochi’s pertinent disclosures are shown in the chart below in association with the corresponding elements of claims 1, 11, and 18.

Claim(s)	Claimed Element	Claimed Amount	Kochi’s Amount of Element
1, 11, 18	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.
1, 11, 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.
1, 11, 18	Copper (“Cu”)	ranging from 0.1 to about 0.3 weight percent of the spring	“an upper limit of the Cu content is set to 1%” “[a] preferable lower limit of Cu content is 0.01%”

			“[t]he upper limit thereof is preferably not more than 0.8%” <i>Id.</i> ¶ 28
1, 11	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.
18	Aluminum (“Al”)	about 0.003 weight percent of the spring	“an upper limit thereof is therefore set to 0.03%” “a preferable lower limit of Al content is 0.0003%” “the upper limit thereof is preferable not more than 0.01%, more preferably not more than 0.005%.” <i>Id.</i> ¶ 24

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, and 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. Claims 1, 11, and 18

Petitioner contends that the challenged claims “are unpatentable under 35 U.S.C. § 103(a) over Gladney in view of Kochi and Magrab.” Pet. 11. 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 12); that Kochi discloses “a high-carbon steel spring comprising the same combination of alloying elements as claimed in the ’805 Patent” (*id.*); and that Magrab discloses that “for high carbon steel springs, the ‘total alloying elements’ concentration should be ‘up to 2% total.’” (*id.* at 13 (citation omitted)). Petitioner concludes that “the features recited in the challenged claims of the ’805 Patent were well-known and therefore are unpatentable.” *Id.* at 14. Petitioner also concludes that “the prior art discloses all the claimed materials and ranges claimed in the ’805 Patent, and therefore presents a prima facie case of obviousness.” *Id.* at 23 (emphasis omitted). We disagree with Petitioner’s conclusions.

“[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. It is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention would

have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

Petitioner’s rationale for the proposed combination of references is that it would have been obvious “to apply the alloy compositions as taught by Kochi to the wire spring of Gladney to obtain the multiple benefits as taught by Kochi.” Pet. 33. According to Petitioner,

[t]he combination is nothing more than applying a known technique of producing a high-carbon spring steel, as taught by Kochi, to the known spring of Gladney to yield the predictable results of, for example, providing excellent wire-drawing workability, generating wire insusceptible to wire break, extending die life, increasing a wire-drawing rate thereby enhancing productivity during the manufacturing process, reducing cost, and producing a product, *e.g.*, spring that is less susceptible to breakage.

Id. at 33–34 (citing Ex. 1002 ¶ 71).

Paragraph 71 of Exhibit 1002, the Declaration of Dr. O’Malley, is essentially a verbatim repetition of the portion of the Petition quoted above. It does not provide any underlying facts or data on which the opinion is based, and thus is entitled to little or no probative weight. 37 C.F.R.

§ 42.65(a). Neither the Petition nor the cited portion of Dr. O’Malley’s Declaration refers to any persuasive evidence to support the assertions that the proposed combination of references extends die life, increases a wire-drawing rate thereby enhancing productivity during the manufacturing process, reduces cost, and produces a product, *e.g.*, a spring, that is less susceptible to breakage.

We acknowledge that Kochi discloses that the *Kochi invention* “relates to a wire rod excellent in wire-drawing workability, out of which a drawn wire product, such as a steel cord, beading wire, PC steel wire, spring

steel, can be efficiently produced with high productivity.” Ex. 1004 ¶ 1. The challenged claims, however, are *not* the claimed or disclosed wire rod invention in Kochi, which, as claimed, requires a “wire rod comprising a pearlite structure wherein an area ratio of a second-phase ferrite is not more than 11.0%, and a pearlite lamellar spacing is not less than 120 μm .” *Id.*, claim 1. As disclosed, Kochi teaches the need to control the metal microstructure of the wire rod. Kochi discloses:

the wire rod with excellent resistance to wire-break, causing little die-wear, and excelling in the wire-drawing workability can be obtained by adequately controlling the requirements for the metal microstructure thereof (the area ratio of the second-phase ferrite, and the pearlite lamellar spacing) and the requirements for the chemical components thereof.

Id. ¶ 71. Petitioner does not cite any persuasive evidence that Kochi achieves any of the asserted advantages of the disclosed alloy without the claimed and disclosed pearlite structure. There also is no persuasive evidence that the asserted benefits in Kochi can be achieved with an alloy that does not include the metal microstructure of Kochi, or does not include manganese, phosphorus, sulfur, nitrogen, aluminum and oxygen, all of which are specifically included in Kochi’s invention, but which are not collectively recited in claims 1, 11, and 18.

Moreover, there is no persuasive evidence as to why it would have been obvious to selectively glean some elements or structure from Kochi’s disclosure, but not others, to come up with the limitations in claims 1, 11, and 18. “A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of argument reliant upon *ex post* reasoning.” *See KSR*, 550 U.S. at 421 (citation omitted). Indeed, as Patent

Owner points out, the evidence establishes a complex interrelationship among alloy elements:

Both alloying and residual elements can profoundly affect steel production, manufacture into end products, and service performance of the end product. *The effects of one alloying element on a steel may be affected by the presence of other elements; such interactive effects are complex.* In addition, the effects of a particular element may be beneficial to steel in one respect but detrimental in others.

Prelim. Resp. 25 (citing Ex. 1006 at 12).

Petitioner asserts that the challenged claims merely “[d]iscover the optimum or workable ranges by routine experimentation.” Pet. 41. We disagree. The challenged claims do not include the same alloy disclosed in Kochi or the metal microstructure thereof.

We also acknowledge that Gladney and Magrab disclose that the cost of materials is a factor to be considered when choosing an alloy. *Id.* at 42 (citing Ex. 1003, 1005). Such disclosure, however, does not demonstrate that claims 1, 11, and 18 would have been obvious based on Gladney, Kochi, and Magrab. 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 coil spring recited in claims 1, 11, and 18 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 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 an 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, and 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 or the cost of the coil spring recited in claims 1, 11, and 18. See Ex. 1002 ¶¶ 69, and 91–93. Moreover, there is no persuasive evidence or data to support Dr. O’Malley’s opinion that the combined disclosures of the references “would have reduced total manufacturing cost of the spring to thereby enhance commercial opportunities. *Id.* ¶ 93.

Based on the evidence of record, Petitioner has not demonstrated a reasonable likelihood that it would prevail with respect to challenging the patentability of claims 1, 11, and 18.

iii. Dependent Claims 2–9, 12–17, and 19–20

Claims 2–9 depend from claim 1, claims 12–17 depend from claim 11, and claims 19–20 depend from claim 18, and, like for claims 1, 11 and 18, Petitioner contends that claims 2–9, 12–17, and 19–20 are unpatentable over Gladney, Kochi, and Magrab (Pet. 44–59). 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. 36–38. As discussed above, we determine that Petitioner fails to demonstrate that claims 1–20 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 claim.

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 '805 patent is DENIED.

IPR2015-01753
Patent 8,474,805 B2

PETITIONER:

David M. O'Dell
David L. McCombs
Gregory P. Huh
HAYNES AND BOONE, LLP
david.odell.ipr@haynesboone.com
david.mccombs.ipr@haynesboone.com
gregory.huh.ipr@haynesboone.com

PATENT OWNER:

J. Steven Baughman
Nicole M. Jantzi
ROPES & GRAY LLP
steven.baughman@ropesgray.com
nicole.jantzi@ropesgray.com