

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TYCO FIRE PRODUCTS LP,
Petitioner,

v.

VICTAULIC COMPANY,
Patent Owner.

IPR2016-00279
Patent 8,646,165 B2

Before HYUN J. JUNG, BARRY L. GROSSMAN and
JEREMY M. PLENZLER, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Tyco Fire Products LP (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–16 of U.S. Patent No. 8,646,165 B2 (Ex. 1101, “the ’165 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 2 (“Pet.”). Victaulic Company (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 7 (“Prelim. Resp.”). Claims 1–16 were challenged under four separate and distinct grounds. Pet. 13–14. We instituted review on three of the four grounds, including review of claims 1–6, 8–14, and 16. Paper 11, 23 (“Dec. Inst.”). We did not institute trial on claims 7 and 15. *Id.* at 14.

The grounds on which we instituted trial are:

Whether claims 1, 3, 4, 8, 9, 11, 12, and 16 of the ’165 patent are anticipated under 35 U.S.C. § 102 by Lewis¹;

Whether claims 5, 6, 13, and 14 would have been obvious under 35 U.S.C. § 103 based on Lewis; and

Whether claims 2 and 10 would have been obvious under 35 U.S.C. § 103 based on Lewis and Lane².

Patent Owner filed a Response to the Petition (Paper 14, “PO Resp.”), and Petitioner filed a Reply (Paper 22, “Pet. Reply”).

Petitioner submitted 21 exhibits (Exs. 1101–1121). Patent Owner submitted 24 exhibits (Exs. 2001–2013, 2015–2017, 2020–2026).

A hearing was held March 13, 2017. Paper 38 (“Tr.”).

¹ UK Patent Application No. 2211255 A (published June 28, 1989) (Ex. 1102).

² UK Patent Application No. GB 2218768 A (published November 22, 1989) (Ex. 1103).

We have jurisdiction under 35 U.S.C. § 6. We enter this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has the burden of proving a proposition of unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e). As described below, we determine that Petitioner has met its burden to establish that claims 1–6, 8–14, and 16 are unpatentable.

B. Related Proceedings

Petitioner and Patent Owner state the '165 patent also is the subject of a petition for *inter partes* review in IPR2016-00278. Pet. 2; Paper 7, 1.

Petitioner also states that the patent in petitions for *inter partes* reviews filed in IPR2016-00276 and IPR2016-00277 is related to the '165 patent. Pet. 3. In both IPR2016-00276 (Paper 9; Paper 12) and IPR2016-00277 (Paper 9; Paper 14), the Board denied institution of an *inter partes* review and denied requests for rehearing in each case.

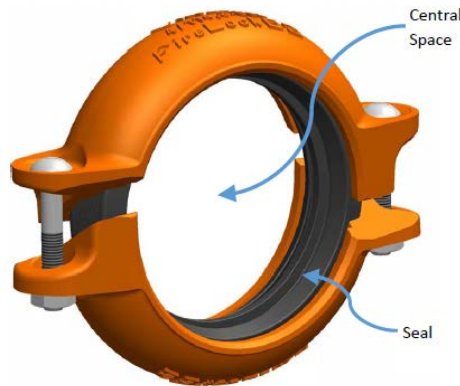
Petitioner states the '165 Patent is a continuation of U.S. Patent No. 7,712,796 (the "'796 Patent"), which is a divisional of U.S. Patent No. 7,086,131 (the "'131 Patent"). Pet. 2. Both the '796 patent and the '131 patent have been involved in requests for *inter partes* reexaminations. *Id.*

C. The '165 Patent

The '165 patent discloses methods of connecting together sections of pipes, such as, for example, water distribution pipes in a fire protection system. The connection is made using pre-assembled mechanical pipe couplings. The couplings surround end portions of aligned pipe elements. The couplings are deformable to conform to the outer surface of the pipe

elements. According to the disclosure, a pre-assembled, deformable coupling facilitates assembly of the pipe joint. Ex. 1101, 1:16–20.

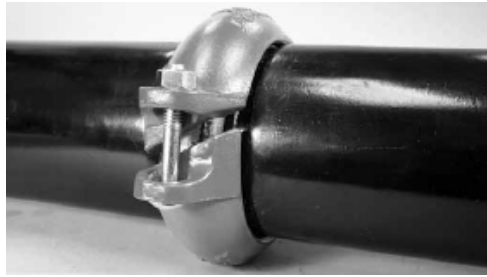
Patent Owner provides the following illustration of an asserted commercial embodiment of the claimed invention. Ex. 2006, 23³.



Perspective drawing of Patent Owner's Style 009 coupling.

The ends of two pipes to be joined are inserted into the central space from opposite sides of the coupling, and the bolts are tightened around the joint or interface of the two pipes. The following illustration from Patent Owner shows the Style 009 coupling assembled onto pipes. *Id.* at 29. The interface of the pipe ends is secured by the coupling and seal.

³ Exhibit 2006 is a declaration from Lawrence W. Thau, Jr. The declaration has several attachments, which are identified as Exhibits A–L, with each of the attachments having multiple pages. This creates the somewhat confusing citation of, for example, “Exhibit 2006, Ex. B, 1” when citing to page 1 of Exhibit B, which is part of Exhibit 2006. Exhibit 2006 also is paginated in accordance with our rules (pages 1–117). See 37 C.F.R. § 42.63(d)(2)(ii). We cite to the page numbers of Exhibit 2006.



Perspective illustration of Patent Owner's Style 009 Coupling installed and connecting two pipes.

Thus, as shown, the Style 009 coupling consists of two coupling segments, a seal element, and two bolts that tighten the coupling elements and seal element around pipe ends secured by the coupling.

According to the '165 patent, prior art couplings required a technician to “totally disassemble and reassemble the coupling.” Ex. 1101, 2:16. As stated in the '165 patent, [s]ignificant time, effort and expense would be saved if the technician could install a mechanical pipe coupling without first totally disassembling it and then reassembling it, piece by piece.”

Id. at 2:17–20. The disclosed device and method address this asserted problem with a coupling that allows the pipe elements to be inserted into the coupling “without first disassembling the coupling.” *Id.* at 4:27–28. The Specification states “[t]his feature provides a significant advantage over prior art couplings which must be assembled onto the pipe ends piece by piece.” *Id.* at 4:28–30. According to the patent, “[j]oining of the pipe ends with a coupling 10 according to the invention proceeds much more smoothly and quickly than with prior art couplings because the technician handles fewer pieces and does not have to thread nuts onto bolts.” *Id.* at 4:30–34.

The disclosed method and related components are illustrated in Figures 1A and 2 of the '165 patent, reproduced below.

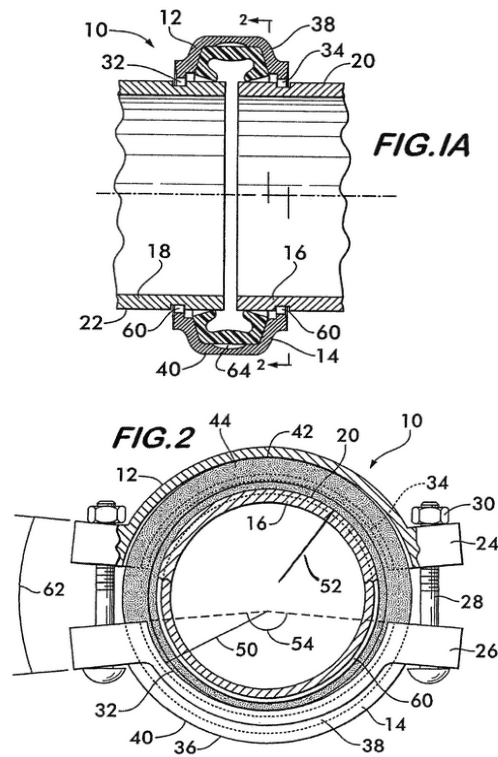


Figure 1A is a longitudinal cross-sectional view illustrating pipe elements attached in end-to-end relation using a circumferential coupling. *Id.* at 3:8–10. Figure 2 is a partial cross-sectional view of the pipe coupling shown in Figure 1. *Id.* at 3:11–12.

As shown in Figures 1A and 2, reproduced above, pipe coupling 10 is formed from coupling segments 12 and 14. Segments 12 and 14 are interconnectable with one another to straddle end portions 16a and 18a of pipe elements 16 and 18 to thereby secure the pipe elements together in end-to-end relationship. The end portions of the pipe elements have outer surfaces 20 and 22 of substantially cylindrical profile.

Lugs 24 and 26 (shown in Figure 2) connect coupling segments 12 and 14. *Id.* at 3:54–56. Lugs 24 and 26 are adapted to receive fasteners, such as bolts 28 and nuts 30, which adjustably connect the coupling

segments to one another. *Id.* at 3:58–62. Claims 8 and 16 are directed to method steps involving the lugs.

Each coupling segment 12 and 14 has a pair of spaced, arcuate surfaces 32 and 34. *Id.* at 3:54–56. Surfaces 32 and 34 extend from housing 36 having sidewalls 38 joined to backwall 40, forming channel 42 that receives seal 44. *Id.* at 3:64–4:3. Examples of seal 44 are shown in Figures 4 and 5. Seal 44 is preferably a flexible, resilient ring formed from elastomeric material. The seal may have “lips 46” and “tongue 48” (*see* Fig. 5) positioned between lips 46. Tongue 48 provides a stop surface that engages the ends of pipe elements 16 and 18 to ensure proper positioning of the seal 44 relative to the pipe elements. Independent claims 1 and 9 do not recite a seal element. Claims 4–6 and 12–14 are directed to method steps involving the seal.

The disclosed method involves inserting pipe elements 16 and 18 into coupling 10, and tightening the fasteners (e.g., bolts 28 and nuts 30) to thereby draw arcuate surfaces 32 and 34 on segment 12 toward those on segment 14. *Id.* at 4:44–48. This results in bringing segments 12, 14 into contact with the outer surface of pipe elements 16 and 18 and causes segments 12, 14 to deform such that surfaces 32 and 34 substantially conform to the curvature of pipe elements 16 and 18. *Id.* at 4:48–53. This step, recited in dependent claims 2 and 10, is referred to as the “deform to conform” step.

D. Illustrative Claim

Claims 1 and 9 are independent claims. Independent claim 1 is substantively identical to claim 9. The only distinction between claim 1 and claim 9 is that the first clause from the body of claim 1 (“using a coupling

having a plurality of coupling segments . . .”) is included in the preamble of claim 9. This is a distinction without a substantive difference. Patent Owner agrees. Tr. 34 (“We would agree, Your Honor, it is a matter of semantics, not substance. So any arguments that apply to 1 apply to 9, and vice versa.”).

Dependent claims 2–8, dependent, directly or indirectly, from claim 1 are substantively identical to their respective counterparts, claims 10–16, dependent, directly or indirectly, from claim 10. Again, Patent Owner agrees. *Id.* at 35:1–6. Thus, our analysis of claims 1–6, and 8 applies equally to their substantively identical counterparts, claims 9–14, and 16.

Independent claim 1 is representative of the claimed invention and is reproduced below.

1. A method of securing facing end portions of pipe elements together in end-to-end relationship, wherein said end portions of said pipe elements have an outer surface of substantially cylindrical profile, said method comprising:

using a coupling having a plurality of coupling segments attached to one another at both ends surrounding a central space, said coupling segments having arcuate surfaces adapted to interface with the outer surfaces of said pipe elements;

while said segments are attached to one another at said both ends, supporting said segments in spaced relation sufficient to permit insertion of said end portions of said pipe elements into said central space;

while said segments are attached to one another at said both ends and supported in spaced relation, axially inserting said end portions of said pipe elements into said central space; and

drawing said coupling segments towards one another so as to engage said arcuate surfaces with said outer surfaces of said pipe elements.

II. ANALYSIS

A. Claim Construction

We interpret claims using the broadest reasonable construction in light of the specification of the patent in which the claims appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as 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). Any special definitions for claim terms must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

1. “Coupling Segments”

Petitioner proposes a construction for two clauses in claim 1: “coupling having a plurality of coupling segments” (Pet. 11); and “coupling segments attached to one another at both ends” (*id.* at 12). Petitioner proposes that the first clause means “a coupling that comprises two coupling segments” (*id.* at 11), and the second clause means “each end of the first segment is connected to each respective end of the second segment, and the coupling has no more than two segments” (*id.* at 12).

In its Reply, Petitioner focuses on the phrase “at both ends” in claim 1, which was added by amendment to replace the phrase “end-to-end.” Pet. Reply 3–4 (citing Ex. 1106, 12). Petitioner emphasizes in its Reply that the “restriction requirement” during prosecution, “combined with Victaulic’s

claim amendments” and “other evidence presented in the original Petition establish that the challenged claims “require a coupling with only two segments.” *Id.* at 4 (citing Pet. 6–12).

At the hearing, however, Petitioner acknowledged that “[i]t doesn’t matter [to patentability] whether there is two or more than two [coupling segments] . . . So in that sense it is not [outcome] determinative.” Tr. 10:12–15.

Patent Owner provides an extensive discussion of claim construction (PO Resp. 2–15) and concludes Petitioner’s proposed constructions “are both irrelevant and incorrect.” *Id.* at 15.

In its Reply, Petitioner asserts that “Claims Construction Is Relevant.” Pet. Reply 3.

It is beyond reasonable dispute that claim construction is relevant to a determination of patentability. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (citation omitted) (“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’”); Giles S. Rich, *The Extent of the Protection and Interpretation of Claims-American Perspectives*, 21 Int’l Rev. Indus. Prop. & Copyright L., 497, 499 (1990) (“The name of the game is the claim.”). This does not mean, however, that every word of every claim requires specific construction. *Vivid Techs.*, 200 F.3d at 803.

We determine that an explicit construction of the two “coupling segment” clauses identified by Petitioner is not necessary for this Decision.

B. Grounds of Unpatentability

1. Anticipation by Lewis

a. Claims 1 and 9

[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008); *see also Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.”). “The identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

Lewis discloses a segmented sleeve-like coupling for connecting the ends of two pipes. Ex. 1102, 2:4–6. An annular seal ring is located between the segments and the ends of the pipes. *Id.* at 2:9–11. The Lewis coupling may be supplied to the user in “a pre-assembled condition” with the seal ring positioned within the segments and the nut and bolt fasteners connecting the segments “loosely positioned.” *Id.* at 8:21–25. The coupling can be “easily and quickly” fitted to the pipe ends and assembled “without any dismantling” of the coupling. *Id.* at 12:19–21. Once the pipes are inserted into the coupling, the segments are fastened and tightened together to hold the pipes in place. *Id.* at 2:11–12.

The general structure of the Lewis coupling is shown in Figures 1 and 3, reproduced below.

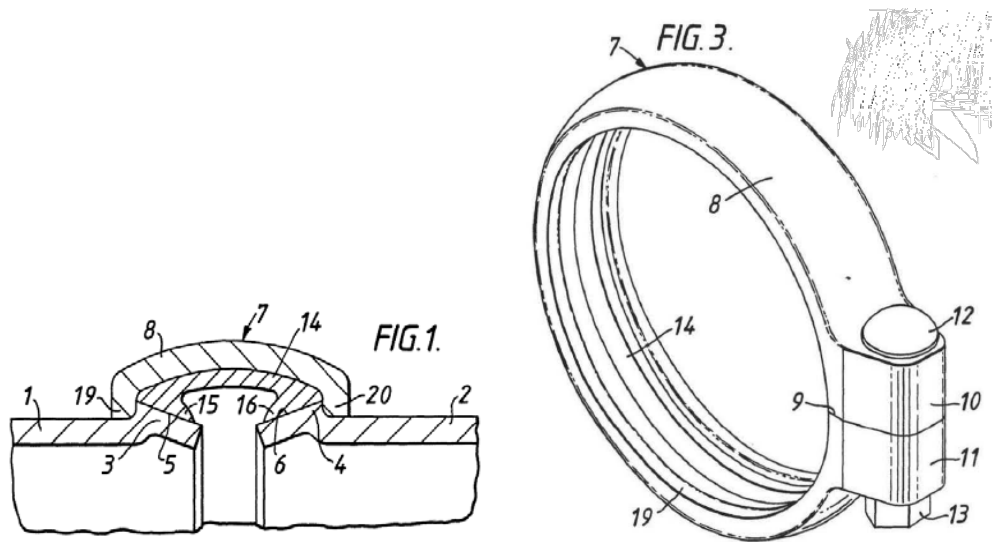


Figure 1 from Lewis is a sectional view of a coupling. Figure 3 from Lewis is a perspective view of a one-piece coupling.

As shown in Figures 1 and 3, the coupling includes a sleeve-like housing 8 of segmented annular configuration. In this illustrated embodiment, the housing is a *single segment* split by a single axially extending slit 9 (see Figure 3). Lewis discloses, however, that for larger sized pipes, such as pipes above approximately a 12 inch internal diameter, “a plurality of segments and fastening means” for the segments may be provided. Ex. 1102, 5:12–14 (emphasis added). Thus, Lewis specifically discloses a coupling having two or more coupling segments (a plurality of segments) and two or more fastening means for the segments (a plurality of fastening means).

Lewis provides one specific *illustrated* example of a coupling with two segments in Figure 7, reproduced below.

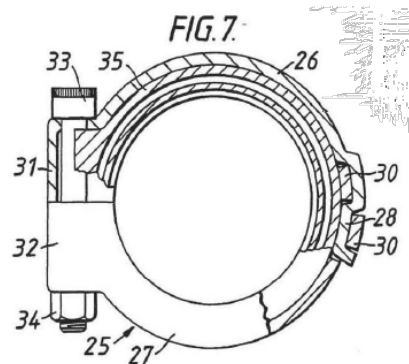


Figure 7 from Lewis is a sectional front view of a two piece coupling.

Referring to Figure 7, housing 25 has two segments 26 and 27.

Id. at 9:22–26. Segments 26, 27 have “latch lugs” 31, 32 at opposing ends at one side of segments 26, 27. *Id.* at 10:1–2. Bolt 33 and nut 34 pass through bores in the lugs to securely clamp together segments 26, 27. At the other side of segments 26, 27, a “latch” comprising hook 28 and slots 29 (see Fig. 8) connect the two segments.

Lewis makes clear, however, that its disclosure is not limited to the specific connectors shown in Figures 3 and 7 for a one or two-piece coupling. Lewis discloses “fastening means” securable across “the or *each* slit,” for one-piece or multiple piece coupling segments. *Id.* at 4:23–24 (emphasis added). Lewis then discloses at least three forms of “fastening means:” nuts and bolts (as shown in Figures 3 and 7); a toggle; or a latch (as shown in Figure 7). Lewis discloses:

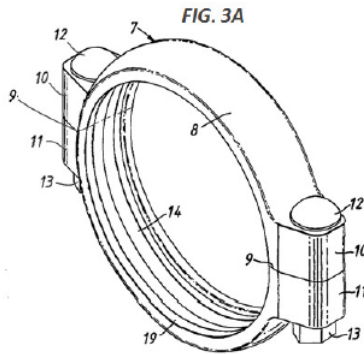
fastening means may conveniently comprise appropriate nuts and bolts fitting within bores in lugs *adjacent each side of the axial slit*. *In an alternative*, a toggle or latch arrangement can be used.

Id. at 5:8–11 (emphases added).

Thus, we find that Lewis discloses that a plurality of segments and a plurality of fastening means may be used, and that the fastening means may be either (1) bolts fitting within bores in lugs adjacent each side of the axial slit, or (2) a toggle, or (3) a latch arrangement.

i. Petitioner's Figure 3A

Petitioner provides a modified version of Figure 3 from Lewis to illustrate one of the disclosed combinations and permutations disclosed in Lewis. Petitioner's modified Figure 3, identified as Figure 3A by Petitioner, is reproduced below.



Petitioner's Figure 3A,
which is a modification of Lewis' Figure 3. Pet. 20.

As shown in Petitioner's Figure 3A, one of the expressly disclosed combinations and permutations in Lewis, is a two-piece coupling having two bolt/lug fastening means, one on each end of each segment. This coupling, like all the couplings disclosed in Lewis, can be shipped in pre-assembled form, and installed as disclosed in Lewis. Pet. 20; see Ex. 1102 at 8:21–9:13; see also Ex. 1105 ¶ 51 (declaration testimony of Mr. Phillips explaining that the disclosed multi-segment coupling disclosed in Lewis be visualized by Figure 3A, redrawn from Figure 3); Ex. 2005, 32:17–21 (“I drew Figure 3A in an attempt to make it clearer to a reader that the two-

piece – the two-segment coupling applied, had the same properties in that respect as the one-piece coupling.”).

Patent Owner refers to Petitioner’s Figure 3A as a “hypothetical” figure. *E.g.*, PO Resp. 26 (“Tyco’s hypothetical Figure 3A”). We disagree with this characterization. As we explain below, the modified Figure 3A represents an actual, disclosed embodiment in Lewis. A coupling having two segments secured by nuts and bolts, as shown in Petitioner’s Figure 3A may not be illustrated in Lewis, but it is specifically disclosed in Lewis. It is not “hypothetical.”

In *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376 (Fed. Cir. 2015), the challenged claim required a ruthenium binding agent and a PVD coating to be used together. The prior art reference disclosed five binding agents (one of which was ruthenium) and three coating techniques (one of which was PVD). The reference never disclosed the specific combination of ruthenium and PVD, but it taught that any of the five binding agents could be used with any of the three coating techniques. The Federal Circuit held that substantial evidence supported the Board’s finding that the reference effectively taught fifteen combinations, one of which anticipated the challenged claim. *Kennametal*, 780 F.3d at 1382–83.

Here, similar to the disclosure in *Kennametal*, we find that Lewis discloses that any one of the three disclosed fasteners can be used with a single segment or multi-segment coupling. It is Petitioner’s position that one of these specifically disclosed combinations and permutations, the one shown in Petitioner’s Figure 3A, anticipates claims 1, 3, 4, 8, 9, 11, 12, and 16.

Our decision is distinguished from *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd*, 851 F.3d 1270 (Fed. Cir. 2017). In *Nidec*, the Federal Circuit reversed the Board where the Board “improperly assumed disclosure of a claim element.” *Id.* at 1274. We are not assuming disclosure; nor are we relying on what a skilled artisan would envisage. We are relying on the express disclosure in Lewis that nuts and bolts fitting within bores in lugs adjacent each side of the axial slit are an appropriate fastening means for a coupling have two or more coupling segments. Ex. 1102, 5:8–11.

The two piece coupling disclosed by Lewis and relied on in this proceeding is represented accurately in Petitioner’s Figure 3A. Whether one (1) starts with Lewis’ Figure 3 structure and adds one or more segments and fasteners, which Lewis states may be needed for larger pipes (Ex.1102, 5:12–14), or (2) starts with Lewis’ Figure 7 and changes the latch fastener to a nut and bolt fastener, which are both disclosed as alternatives (*id.*), the resulting structure is the same, and is represented in Petitioner’s Figure 3A.

According to Petitioner’s view of the Lewis disclosure, “Lewis describes all of the limitations in claims 1, 3-4, 7-9, 11-12 and 15-16 of the 165 Patent, and anticipates those claims.” Pet. 18. Petitioner relies on the Declaration of Samuel R. Phillips, P.E., (Ex. 1105)⁴ for evidentiary support.

⁴ Mr. Phillips has a Master’s of Science degree in Mechanical Engineering and is a Registered Professional Mechanical Engineer in California. Ex. 1105 ¶ 7. He worked for 50 years in various industry and academic positions, and has significant experience in engineering and manufacturing of mechanical components and devices. *Id.* at ¶ 8. He has designed custom pipe couplings and fittings, and has specified and applied many types of standard pipe couplings and fittings, including plain-end pipes, grooved-end pipes and shouldered pipes. *Id.* at ¶ 9.

Patent Owner takes a different view of Lewis. According to Patent Owner, Lewis does not disclose at least two limitations of claims 1 and 9. PO Resp. 17. The asserted two missing claim limitations are:

1. ‘while said segments are attached to one another at said both ends, *supporting said segments in spaced relation* sufficient to permit insertion of said end portions of said pipe elements into said central space’; [and]
2. ‘while said segments are attached to one another at said both ends and supported in spaced relation, *axially inserting said end portions of said pipe elements* into said central space.’

Id. (emphasis added).

Patent Owner’s position is based on the two specific illustrated embodiments in Figures 1–5 and Figures 6–10. *Id.* at 21

As we discussed above, Patent Owner ignores or misconstrues the clear disclosures in Lewis that multiple segments can be used for larger pipes, and that the fastening means used may be selected to be appropriate for the task at hand. Ex. 1102, 5.

Patent Owner also ignores or misconstrues the clear disclosure that Lewis is pre-assembled. As clearly disclosed in Lewis, and discussed above, the Lewis coupling may be supplied to the user in “a pre-assembled condition” with the seal ring positioned within the segments and the nut and bolt fasteners connecting the segments “loosely positioned.” Ex. 1102 at 8:21–25. The coupling can be “easily and quickly” fitted to the pipe ends and assembled “without any dismantling” of the coupling. *Id.* at 12:19–21. Once the end portions of the pipes are inserted axially into the central space of the coupling, the segments are fastened and tightened together to hold the pipes in place. *Id.* at 2:11–12.

Lewis also discloses the method of assembling the coupling to the pipes:

The coupling 7 from which the joint of Figure 1 is assembled may be supplied to the user in a pre-assembled condition with the sealing ring 14 located within the housing 8, and with the nut 13 and bolt 12 fastenings loosely positioned. In this condition, one pipe 1 can be pushed into the coupling 7 until shoulder 19 of the housing is behind the shoulder 3 on the pipe and the appropriate sealing lip 15 of the sealing ring is in contact with the tapered portion 5 of the pipe ends. The second pipe 2 is then inserted into the open end of the coupling 7 again until its shoulder 4 is fully in position behind the shoulder 20 of the housing. In this condition, the sealing ring 14 is in direct contact with both pipe ends within the housing. The nut and bolt fastening 12, 13 is then tightened until the lugs 10, 11 of the housing are in contact with each other so that the axial slit 9 is closed. At this point, the tolerances of the arrangement are such that the internal diameter of the housing shoulders 19, 20 is in partial or total contact with the outside diameter of the pipes 1, 2.

Ex. 1102, 8:21–9:13. The quoted passage refers to “coupling 7,” which is shown in the embodiment of Figures 1 and 3. When asked at his deposition about the discussion of “coupling 7,” which is a one-piece coupling, Mr. Phillips testified that the one-piece and two-piece couplings “had the same properties” as to being preassembled and how it was used. Ex. 2005, 32:1–21. Mr. Phillips stated: “I drew Figure 3A in an attempt to make it clearer to a reader that the two-piece – the two-segment coupling applied, had the same properties in that respect as the one-piece coupling.” *Id.* at 32:17–21.

Based on the quoted passage from the disclosure, we find that Lewis discloses the two limitations Patent Owner asserts are missing from Lewis. Lewis discloses that while the two or more segments are attached to one another at said both ends, the segments are supported in spaced relation by

the loosely positioned nuts and bolts sufficient to permit insertion of the end portions of the pipe elements into the central space of the coupling.

Ex. 1102, 8:21–9:7. Once the pipes are properly positioned, the fasteners are tightened. *Id.* at 9:7–13.

Patent Owner criticizes Petitioner’s Figure 3A drawing of one of Lewis’ disclosed embodiments because it does not have “a low profile and low weight” and “goes against the teachings of Lewis.” PO Resp. 27–28. Figure 3A depicts a disclosed embodiment in Lewis, and thus satisfies in some degree the low profile and low weight advantages sought by Lewis. Moreover, there is no persuasive evidence to support Patent Owner’s position. Mr. Phillips testified that a low profile and low weight are general objectives of designing any coupling. Ex. 2005, 36:22–37:4.

Patent Owner also asserts that Petitioner’s Figure 3A representation of the Lewis disclosure “does not have the structural stability and integrity to hold itself open sufficiently to permit the insertion of pipe ends. PO Resp. 29 (citing Ex. 2007, ¶ 34). Exhibit 2007 is the Declaration of Lani G. Ache⁵. There is no persuasive evidence to support this speculative assertion. Paragraph 34 of the Ache Declaration is essentially a verbatim repetition of Patent Owner’s argument. There are no facts or data provided to support the

⁵ Declarant Ache was employed by Patent Owner for 10 years in various positions, concluding with the position of Research Metallurgist. Ex. 2007 ¶ 3. Declarant Ache also was a Chief Metallurgist at a division of Ametek. *Id.* at ¶ 4. This position involved design and development of “cryogenic couplings.” *Id.* Declarant Ache also worked for Raytheon as a Manager of Project Quality. *Id.* at ¶ 5. This assignment also included analysis of “various systems that included couplings.” *Id.* Declarant Ache owned a company that developed quality assurance programs for systems that included couplings. *Id.* at ¶ 6.

asserted conclusion. Accordingly, this testimony is entitled to little or no probative weight. 37 C.F.R. § 42. 65.

Patent Owner also asserts that the two segment Figure 3A coupling would have to be separated by a “minimum separation distance.” PO Resp. 29–30. The challenged claims, however, do not recite a minimum separation distance.

ii. Patent Owner’s Arguments Concerning Figures 1–5 in Lewis

Patent Owner dismisses the embodiment disclosed in Figures 1–5 of Lewis because it is a “one piece coupling” and thus does not have “coupling segments” as recited in the claims. PO Resp. 21 (citing Ex. 2007 ¶ 17). Paragraph 17 of the Ache Declaration essentially is a verbatim repetition of Patent Owner’s argument, without any additional supporting facts or data. Moreover, this analysis of Figures 1–5 ignores the Lewis embodiment shown in Petitioner’s Figure 3A, which is the specific embodiment asserted to anticipate claims 1 and 9.

iii. Patent Owner’s Arguments Concerning Figures 6–10 in Lewis

Patent Owner next focuses on the specific two-piece coupling in Figures 6–10 of Lewis to conclude that “Lewis does not disclose that the end portions of pipe elements can be inserted into the two coupling segment housing embodiment of Figures 6–10 when segments 26 and 27 ‘are attached to one another at said both ends.’” PO Resp. 21. We disagree. This analysis of Figures 6–10 also ignores Petitioner’s Figure 3A, which is the specific embodiment asserted to anticipate claims 1 and 9.

Patent Owner’s assumptions about how the two-piece coupling is assembled on the pipes also is inconsistent with the Lewis disclosure and unsupported by persuasive evidence.

In describing the specific two-piece embodiment shown in Figures 6–10 of Lewis, Lewis discloses that a “variation of the gasket of the embodiment of Figures 6 to 10 is illustrated in Figure 11.” Ex. 1102, 11:25–12:3. Figure 11 is reproduced below.

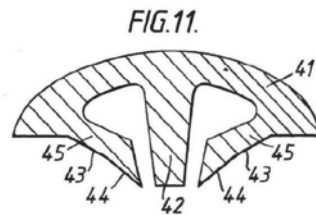


Figure 11 from Lewis is a cross-section of a seal element used in the disclosed coupling.

As shown in Figure 11, seal ring 41 includes center rib 42. This may be a solid circumferential rib, or may be formed of a plurality of projections displaced uniformly around the inner surface of the gasket. *Id.* at 11:25–12:3.

Lewis then explains the method of assembly of the two-piece coupling. Lewis discloses that rib 42 prevents “a pipe end from ‘pushing’ through the gasket past its optimum operational position during assembly of the joint.” *Id.* at 12:4–15. Lewis then discloses:

[i]n assembly a pipe end is inserted into the joint and makes contact with one side of the rib. This prevents any further passage through the ring. A second pipe is then inserted *from the other side of the coupling* in a similar manner.

Id. (emphasis added). Based on this disclosure, we find that the Lewis two-piece coupling is assembled axially, with pipe segments inserted from opposite ends of the coupling. Lewis also discloses that this disclosed two-piece coupling “may be easily and quickly fitted to the pipe ends *without any dismantling*.” *Id.* at 12:19–21. As such, the pipes are inserted as described

generally in Lewis, which is axially into a pre-assembled coupling.
Ex. 1102, 8:21–9:13.

Focusing on the specific example in Figure 7, using a hook and slot fastener, rather than Petitioner’s Figure 3A, Patent Owner asserts it is “impossible” for the “hinge assembly to be sufficiently ‘loosened’ for insertion into the coupling. PO Resp. 23–26 (citing Ex. 2007 ¶ 24–29). Paragraphs 24–29 of the Ache Declaration essentially repeat verbatim Patent Owner’s argument without additional facts or data in support of the argument. This testimony is entitled to little or no probative weight. 37 C.F.R. § 42.65.

Patent Owner concludes from its analysis that Lewis “teaches that the Figures 6-10 embodiment is placed over or around ‘existing pipework’; and not that the required tapered shoulder pipe ends can be inserted into a pre-assembled Figures 6-10 embodiment.” PO Resp. 26.

Patent Owner is correct in stating that Lewis states an advantage of the specific hook and slot connector shown in Figure 7 is that “there is a considerable ease of fitting, especially on *existing pipework* where the need to move pipes apart is obviated in view of the hingable nature of the coupling.” Ex. 1102, 11:11–16. There is no evidence, however, to support Patent Owner’s speculation about dimensions and operation in the drawings on pages 24 and 25 of its Response that the hingeable nature of the coupling when used on existing pipes precludes axial insertion as recited in the claims and as disclosed in Lewis. Indeed, Lewis states just the opposite.

Lewis states:

The coupling and joint as herein described permits a considerable degree of angular misalignment of juxtaposed pipes while still maintaining a fully secure sealed joint, pipe end load

is adequately restrained, the coupling *may be easily and quickly fitted to pipe ends, and can be assembled on the pipe ends without any dismantling.*

Id. at ¶ 12:16–21 (emphasis added). This disclosure follows the disclosure about fitting the coupling on to existing pipework. We find that the “coupling and joint herein described” is not limited and does not exclude the Figure 7 embodiment.

Moreover, couplings that are pre-assembled for axial insertion of *new* pipework does not preclude the same coupling from being used differently for *existing* pipework, as Lewis suggests. Indeed, this is exactly how Patent Owner’s Style 009 coupling works, which is the asserted commercial embodiment of the invention claimed in in the ’165 patent. Ex. 2006, ¶ 15 (“when Victaulic Style 009 couplings are used in accordance with Victaulic’s instructions, such use is covered by [the challenged] claims.”)

Exhibit 2006, 28–31 are the Installation Instructions for Patent Owner’s Style 009 coupling. Ex. 2006, ¶ 13 (“Victaulic’s installation instructions for the Style 009 couplings are attached as Exhibit C.”). For the initial or *new* installation, the user is advised not to disassemble the coupling. *Id.* at 28. The coupling is installed by axially inserting the pipework into the pre-assembled coupling. *Id.* at 29.

For “re-installation” to *existing* pipework, however, the instructions for the Style 009 provide for disassembly, as shown below.



6. **ASSEMBLE HOUSINGS:** Insert one bolt into the housings, and thread the nut loosely onto the bolt to allow for the “swing-over” feature, as shown above. **NOTE:** The nut should be backed off no further than flush with the end of the bolt.



7. **INSTALL HOUSINGS:** Using the “swing-over” feature, install the housings over the gasket. Make sure the housings’ keys engage the grooves properly on both pipes/mating components.

Ex. 2005, 31. Clearly, Lewis’ disassembly of the coupling for reinstallation is *not* inconsistent with maintaining a pre-assembled coupling for initial installation, which is exactly how the claimed method is used.

iv. Tapered Shoulders

Patent Owner also asserts that Lewis’ couplings are limited to pipes with “tapered shoulders,” that are a “required” feature of Lewis’ invention. PO Resp. 20 (citing Ex. 1102, 4:5–10. Lewis discloses, however, that “grooves adjacent the end” of the pipe are “the physical equivalent of a shoulder.” Claims 3 and 11 recite a groove proximate the end of each pipe, as discussed below in the context of these claims. The fact that a groove or tapered shoulder, or a seal, is not recited in claims 1 and 9 does not preclude Lewis from anticipating claims 1 and 9. Each element or step of claims 1 and 9, properly construed, is found in Lewis arranged or combined or performed in the same way as recited in the claims.

Accordingly, we are persuaded that a preponderance of the evidence establishes that claims 1 and 9 based are anticipated by Lewis.

b. Dependent Claims 3, 4, 8, 11, 12, and 16

Claims 3 and 11 recite a circumferential groove in the pipe with the coupling segments fitting within the groove. Lewis discloses the use of such

grooves. Ex. 1102, 1–2. Petitioner asserts that Lewis discloses the claimed structure and method recited in claims 3 and 11. Pet. 29–31 (citing Ex. 1105 ¶¶ 36–39 and 61–66).

Patent Owner asserts that Lewis “requires pipes with tapered shoulders.” Po Resp. 35–37.

As Petitioner points out, Lewis discloses that a grooved pipe end is the “physical equivalent of a shoulder.” Pet. 29; *see* Ex. 1102, 1–2. Lewis discloses:

It is known to provide a pipe joint utilising a coupling in which the ends of two pipes to be connected are each provided either with a shoulder at its end (which may be formed by an expanded end, a turned back end or a thickened end) or *a groove adjacent the end which, when taken with the end portion of the pipe, is the physical equivalent of a shoulder.*

Ex. 1102, 1–2 (emphasis added). There is no persuasive evidence to support Patent Owner’s asserted substantive distinction between a shoulder and a groove.

Accordingly, based on a preponderance of the evidence, we determine that Lewis anticipates claims 3 and 11.

Claims 4 and 12 recite a flexible seal ring. As discussed above, and as asserted by Petitioner, Lewis discloses several variations of the claimed seal ring. *E.g.* Ex. 1102, 8 (disclosing “elastomeric sealing ring or gasket 14”); 11–12 (disclosing gasket 41).

Patent Owner does not specifically address these claims.

Accordingly, based on a preponderance of the evidence, we determine that Lewis anticipates claims 4 and 12.

Claims 8 and 16 require a lug “at each end of each” coupling segment, with the lugs “in facing relation” with “lugs on another said segment” and an

adjustable fastener for drawing the coupling segments together. *E.g.*, Ex. 1101, 11:13–19. Petitioner asserts Lewis discloses the claimed fastener. Pet. 34–36 (citing Ex. 1105 ¶¶ 79–80). As discussed above, Lewis discloses a lug and bolt arrangement at each end of each coupling segment, as shown in Petitioner’s Figure 3A illustration of the Lewis disclosure.

Patent Owner asserts that neither Figures 6–10 of Lewis nor Petitioner’s “hypothetical coupling of its made up Figure 3A” disclose the claimed lugs and adjustable fastener. PO Resp. 37. Based on our findings and analysis above, we disagree.

Accordingly, based on a preponderance of the evidence, we determine that Lewis anticipates claims 8 and 16.

2. Obviousness Based on Lewis Claims 5, 6, 13, 14

In our Decision to Institute an *inter partes* review we determined that Petitioner failed to provide sufficient and persuasive argument and evidence to support its obviousness assertions for claims 1, 3, 4, 7–9, 11, 12, 15, and 16 based on Lewis. Dec. Inst. 18. As stated in that Decision, Petitioner failed to provide persuasive evidence or argument concerning *what* differences exist between Lewis and the claimed invention, *what* is the modification of Lewis Petitioner proposes, and *why* the proposed modification would have been obvious. *Id.* at 16. Without identifying the *what* and *why* of the asserted obviousness of the challenged claims, Petitioner did not established that it was reasonably likely to prevail on the ground of obviousness for claims 1, 3, 4, 7–9, 11, 12, 15, and 16 based on Lewis. *Id.* Accordingly, we declined to institute trial on these claims based

on the assertion that these claims would have been obvious in view of Lewis.

We did institute trial, however, as to whether claims 5, 6, 13, and 14 would have been obvious based on Lewis. Claim 5 depends from claim 4, which depends from claim 1. Claim 6 depends from claim 5. As discussed above, claims 13 and 14 are identical counterparts to claims 5 and 6, respectively. Accordingly, we discuss only claims 5 and 6, which applies equally to claims 13 and 14.

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; (3) the level of ordinary skill in the art; and (4) when available, secondary considerations, such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (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.”). The Court in *Graham* explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context.” *Id.* at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To reach this conclusion, however, 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.*

“A reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect.” *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985).

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR*, 550 U.S. at 421. This does not deny us, however, “recourse to common sense” or to that which the prior art teaches. *Id.*

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

a. Scope and Content of the Prior Art

Lewis has been described above.

b. Differences Between the Claimed Subject Matter and the Prior Art

i. Claims 5 and 13

Petitioner did not assert that claims 5 and 13 were anticipated by Lewis. Petitioner asserts that it would have been obvious “to modify the gasket that is shown in Fig. 2 [of Lewis] to include a central rib, or replace the gasket 14 in the coupling of Fig. 1 with the gasket that is shown in Fig. 11.” Pet. 41. Petitioner refers specifically to Figure 2 of Lewis, which discloses a one-piece coupling. As discussed above, and as recognized by Petitioner (*id.*), Lewis discloses specifically that seal 41 is an alternative to the one-piece seal 35, shown in Figure 9, which is in the context of a two-piece coupling. We understand Petitioner’s assertion to be that it would have been obvious to use seal 41 of Lewis in either a one-piece coupling or a two-piece coupling, specifically the two-piece coupling in Petitioner’s Figure 3A, illustrating one of the disclosed embodiments in Lewis.

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. Prods., Inc. v. Solid State Sys. Corp.*, 755 F. 2d 158, 164 (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.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) (“[T]he 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).

c. Level of Ordinary Skill

Petitioner asserts a person of ordinary skill in the relevant technology would have a Bachelor's degree in mechanical engineering or equivalent, and 2 to 5 years of relevant experience in the coupling arts. Pet. 11 (citing Ex. 1105 ¶¶ 19–20).

Patent Owner does not propose in its Response a level of skill in the relevant technology.

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The absence of an express finding about the level of skill in the art “does not give rise to reversible error ‘where the prior art itself reflects an appropriate level and a need for testimony is not shown.’” *Id.* The Supreme Court informs us that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421. For purposes of this Decision we determine that the prior art itself reflects an appropriate skill level.

d. Discussion

i. Claims 5, 6, 13, and 14

Claims 5 and 13 recite that the seal ring has “a tongue” extending circumferentially around the ring and projecting radially inwardly, and the method requires engaging the end portions of the pipe elements with the tongue upon assembly of the coupling to the pipe ends. As discussed above, as a variation to the seal in the two-piece coupling of Figures 6–10, Lewis discloses that seal 41 (shown in Fig. 11), with center rib, or tongue, 42, may be used. Ex. 1102, 11–12. Lewis discloses that when the pipe end is

inserted axially into the coupling it makes contact with one side of the rib.
Ex. 1102, 12.

Claims 6 and 14 depend from claims 5 and 13, respectively, and recite that the seal ring includes a pair of circumferential lips positioned on opposite sides of the tongue, and that one of the lips engages each end portion of the pipe elements when the pipes are inserted into the coupling. Petitioner states that “Lewis describes” the claimed structure and method.

Petitioner’s rationale for this proposed modification is “a POSITA would have recognized [] the added benefits of having a central rib to prevent the pipes from being pushed past the coupling’s optimal operating position.” Pet. 41 citing Ex. 1105 ¶¶ 71–73).

Patent Owner does not address specifically the asserted obviousness of claims 5 and 13. Patent Owner asserts only that claims 5, 6, 13 and 14 should not be found obvious because they depend from claims 1 and 9, respectively, and because, in Patent Owner’s view, “Lewis does not disclose all of the limitations of claims 1 and 9.” PO Resp. 38. As discussed above, and contrary to Patent Owner’s position, we have determined that Lewis discloses all of the limitations of claims 1 and 9.

Based on the findings and analysis above we are persuaded that claims 5, 6, 13, and 14 would have been obvious in view of the disclosure in Lewis.

3. Claims 2 and 10 Obviousness Based on Lewis and Lane

Claims 2 and 10 each recite the step of deforming the coupling segments to conform to the outer surface of the pipe.

a. Scope and Content of Lane

Lane discloses a coupling or joint for connecting co-axial lengths of piping. Ex. 1103, 2:3–4. Figures 1 and 2 from Lane are reproduced below.

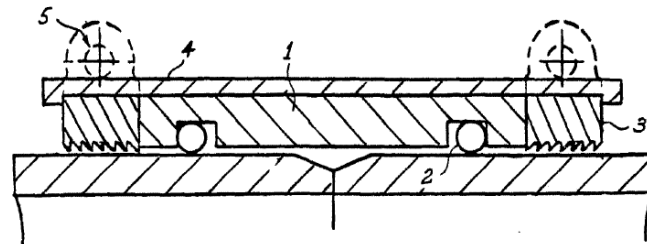


FIG 1

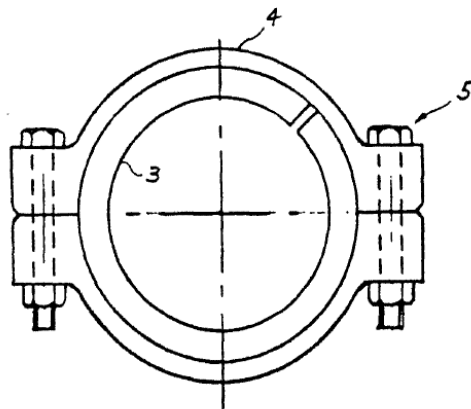


FIG 2

Figure 1 is a partially sectioned side elevation of a pipe coupling in an untightened condition. *Id.* at 5:34–36. Figure 2 is an end elevation of the pipe coupling of Figure 1, but shown in a tightened condition. *Id.* at 6:1–2. As shown in Figures 1 and 2, the coupling includes tubular body 1 and seal ring 2, which ensures a seal between the body and the pipe when the coupling is tightened. *Id.* at 6:20–25. Tubular body 1 is made from a material with a modulus of elasticity that is sufficiently low to enable tubular body 1 to deform into contact with the outer walls of the pipes when the coupling is tightened. *Id.* at 6:27–32. Annular grippers 3 are located at each

end of tubular body 1. *Id.* at 7:11–12. Enclosing tubular body 1 and grippers 3 is annular enclosure ring 4, which consists of two shells with mating flanges which can be clamped, and drawn inwardly, by means of suitable fasteners, such as bolts and nuts 5. *Id.* at 7:15–20. Lane describes an alternate arrangement in its Figure 4, reproduced below, where annular “gripping formations 6” are part of the annular enclosure ring 4, rather than being separate components. *Id.* at 9:20–22.

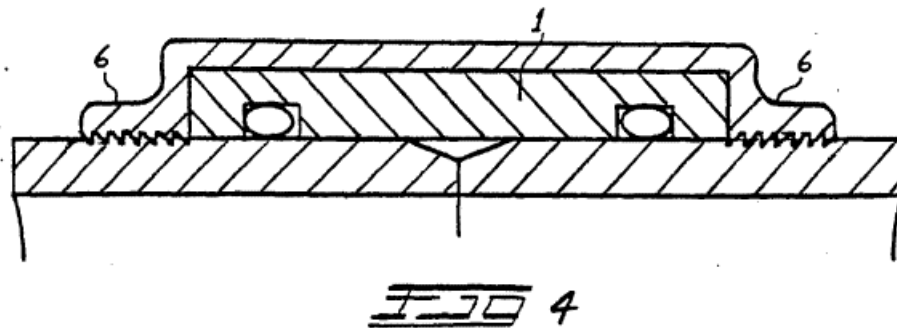


Figure 4 from Lane is a partially sectioned side elevation of a pipe coupling.

In use, the coupling is assembled with clamping fasteners 5 in the untightened position. Ends of two co-axial pipes are inserted into each end of the coupling and positioned centrally, abutting one another. *Id.* at 7:22–25. Inserting the pipe ends into the pre-assembled coupling is achieved with a minimum of resistance because there is a clearance between the gripper ring gripping edges and the outside of the pipes, and the sealing rings have a clearance between their inner edges and the outside of the pipes, or at worst a light interference fit. *Id.* at 7:27–32.

Once the pipes and coupling are in the correct position, clamping fasteners 5 are progressively tightened. *Id.* at 8:1–2. The gripping edges of the annular grippers are deflected radially inward towards the pipe surfaces

and then into the pipe surfaces. *Id.* at 8:7–9. Tubular body 1 is compressed and deforms until circumferential contact is made between the tubular body and the outer surfaces of the pipes. *Id.* at 8:11–14.

b. Discussion

i. “Deform to Conform” Step

Claims 2 and 10 are identical and recite:

deforming said coupling segments so as to conform the curvature of said arcuate surfaces of said coupling segments to said outer surfaces of said pipe elements.

As pointed out by Patent Owner, this “deform to conform” step has two requirements: (1) the coupling segments must deform; and (2) that deformation must cause the arcuate surfaces of the coupling segments to conform to the outer surfaces of the pipe elements. PO Resp. 38. Patent Owner asserts that it is tubular body 1 of Lane that deforms to conform to the outer surface of the pipe, and “[t]ubular body 1 [of Lane] is not the coupling segments of the [165] patent claims.” *Id.* at 41. Patent Owner also asserts that “[t]ubular body 1 is the seal retaining component of the Lane couplings.” *Id.*

According to Patent Owner, “missing is a disclosure in Lane that (1) the segments deform and (2) the segments’ deformation causes their arcuate surfaces to conform to the outer surfaces of the pipes. *Id.* at 43 (citing Ex. 2007 ¶ 50). The cited testimony by Mr. Ache is a one-sentence conclusion that repeats Patent Owner’s argument without providing the underlying facts or data on which the conclusion is based. Ex. 2007 ¶ 50 (“Lane does not disclose that the enclosure ring segments deform, let alone that their deformation causes their arcuate surfaces to conform to the outer surfaces of the pipes.”). We give this testimony no probative weight.

Patent Owner also asserts the teeth of the Lane couplings are “driven into the outer surfaces of the pipe elements; they do not conform to the outer surfaces of the pipe elements.” PO Resp. 43. As explained in Lane, the gripping edges of grippers 3 are deflected radially inward towards the pipe surfaces and then into the pipe surfaces. Ex. 1103, 8:7–9.

Focusing on Lane’s embodiment in Figure 4, Petitioner asserts that Lane “includes integrated fixing elements, describes a coupling with segments that conform to the outer surfaces of the pipes upon application of pressure that is excreted due to tightening of the fasteners such that the coupling segments contact and conform to the pipe’s surfaces.” *Id.* at 46 (citing Ex. 1103, 5:22–23). Petitioner concludes that a person of ordinary skill “would have been guided by the teachings of Lewis and Lane to select a coupling with suitable configuration to allow the housing segments to deflect and deform, so that the arcuate surfaces of the housing conform to the shape of the pipe ends,” as the coupling’s nuts and bolts fasteners are tightened. *Id.* at 46.

As the reason why this proposed modification would have been obvious, Petitioner asserts that the motivation would have been “to ensure a better and tighter fit around the joint.” *Id.* (citing *inter alia* Ex. 1103 (Lane), 2:10-24, listing design objectives for a coupling connecting co-axial lengths of piping.). Petitioner also cites the declaration testimony of Mr. Phillips. *Id.* (citing Ex. 1105 at ¶¶ 40–42 and 81–84).

Mr. Phillips reviews two prior art patents, including Lane, and concludes “that deformable coupling segments were known in the coupling arts many years before the 2004 priority date of the 165 Patent.” Ex. 1105 ¶ 42. Mr. Phillips analyzes the Lane disclosure (*id.* at ¶¶ 81–83), including

the embodiment disclosed in Figure 4 of Lane, and concludes it would have been obvious “to provide a coupling with housing segments that deflect or deform as the nut and bolt fasteners are tightened. *Id.* at 84. In Mr. Phillips’ opinion, [s]uch a coupling would have been one mechanism for providing a tighter seal around the pipe joint.” *Id.* Mr. Phillips opines that a person of ordinary skill:

would have been guided by the description in Lewis and Lane that list plastic, ductile iron or steel for forming the coupling segments (Lewis, Ex. 1102 at 7:17-19; Lane, Ex. 1103 at 7:1-10; 9:2-4) to provide a *deformable coupling segment having gripping elements that deform by deflecting* and driving into the pipe surfaces as the nuts and bolts are tightened.

Id. (emphasis added). Mr. Phillips also testified on cross-examination by Patent Owner that he did not differentiate between the words “deform” and “deflect” in the context of the Lane disclosure. Ex. 2005, 62:4–17; *see also id.* at 63:4–14 (“I find it very hard to distinguish between deflection and deformation. . . . You could use one or the other.”).

Referring to Petitioner’s Figure 3A of one of the disclosed embodiments in Lewis, Mr. Phillips also testified that, when you insert pipes into that coupling, “it could deform to fit the size of the pipe or not,” depending on “how you designed it.” Ex. 2005, 67:18–68:7.

We are persuaded that Lane’s discussion of grippers deflecting radially inward towards the pipe surfaces and then into the pipe surfaces, and Mr. Phillips’ testimony explaining how a person of ordinary skill would understand the Lane disclosure, teaches the “deform to conform” step, and at least suggests the same for the embodiment of Figure 4 where those gripper portions are part of the coupling segments (i.e., it suggests to one skilled in

the art that having the deflection in the Figure 4 embodiment would be beneficial “to ensure a better and tighter fit around the joint”).

ii. *Combining Lewis and Lane*

Patent Owner also asserts “[i]t is a non-intuitive leap to combine Lewis and Lane because they are such different couplings.” PO Resp. 44. According to Patent Owner, “Lane teaches that *the Lane couplings must include the tubular body.*” *Id.* (emphasis added). Patent Owner also argues that “the tubular body is *a crucial component of the Lane couplings.*” *Id.* at 45 (emphasis added). Additionally, Patent Owner asserts that “[r]emoving the tubular body from the Lane couplings would render them inoperable because the *Lane couplings need a tubular body.*” *Id.* (emphasis added).

Patent Owner’s assertions are based on requirements of the Lane couplings. The patentability issue presented, however, is not solely on what Lane discloses or requires. The patentability issue is whether claims 2 and 10 would have been obvious based on the combined teachings of Lewis and Lane.

Contrary to Patent Owner’s assertion, Lewis and Lane are not “such different couplings.” As noted by Petitioner, similar to Lewis, Lane describes that its coupling can be utilized in a preassembled condition, with the clamping fasters (e.g., nuts and bolts) in untightened positions. Pet 44 (citing Ex. 1103, 7:22–25). Petitioner also notes that in both Lewis and Lane, the pipe ends are inserted axially into the coupling and, thereafter, the fasteners are tightened. *Id.* (citing Ex. 1103 at 7:23–32; 8:3–5). Lewis and Lane also share a common recognition of the advantageous use of a coupling in preassembled condition for joining two pipe ends. Pet. 44–45. Lewis

functions without a tubular body as is used in Lane. Thus a tubular body is not a requirement of a functioning coupling. We also note that Lewis discloses that the coupling segments of the Lewis coupling are made from a malleable material, thus suggesting the Lewis coupling segments are deformable. Ex. 1102, 7 (“The housing may be formed of a malleable material which may be of malleable iron, ductile iron, aluminium, plastics or steel, for example.”). Petitioner concludes that a person of ordinary skill “would be guided by teachings in Lane and Lewis and motivated by the shared recognition of advantages of such preassembled couplings to combine Lane and Lewis.” *Id.* at 43–44.

Patent Owner’s criticism of Lane (PO Resp. 41–44 (citing Ex. 2007)) fails to consider that the determination of whether a claimed invention would have been obvious is based on what the combined teachings of the references would have suggested to those of ordinary skill in the art. *MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1294 (Fed. Cir. 2015) (“[W]e have consistently held, as the Board recognized, that ‘[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; *nor is it that the claimed invention must be expressly suggested in any one or all of the references.* Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.’” (citations omitted; emphasis added)).

Moreover, *KSR* does not require that a combination only unite old elements without changing their respective functions. *KSR*, 550 U.S. at 416. Instead, *KSR* teaches that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *Id.* at 421. And it explains that the

ordinary artisan recognizes “that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420. The rationale of *KSR* does not support a theory that a person of ordinary skill can only perform combinations of a puzzle element A with a perfectly fitting puzzle element B. *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1219 (Fed. Cir. 2016). To the contrary, *KSR* instructs that the obviousness inquiry requires a flexible approach. *KSR*, 550 U.S. at 415. When we apply this flexible approach to the evidence discussed above, we find that the combination of Lewis and Lane would have resulted in no more than a predictable result. *Id.* at 417 (“a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.”).

Before determining patentability of claims 2, 5, 6, 10, 13, and 14 under Section 103, we consider the objective evidence presented by Patent Owner.

4. Objective Evidence

Patent Owner asserts that “secondary considerations” establish that “the [c]laims [w]ould not have been [o]bvious. PO Resp. 45–46. Patent Owner relies on the Declaration testimony of Lawrence W. Thau, Jr. *Id.* at 46. Patent Owner’s argument is an approximately 1 page summary (PO Resp. 45–46) of Mr. Thau’s 117 page testimony and attached exhibits (Ex. 2006) on which Mr. Thau relies.⁶ Petitioner asserts that Patent Owner’s

⁶ The Board has declined to consider information presented in a supporting declaration, but not discussed sufficiently in a paper filed in an IPR proceeding because, among other reasons, doing so would permit the use of declarations to circumvent the page limits or word counts that apply to

evidence and arguments do not tip the evidentiary scale in favor of patentability. Pet. Reply 11–17. Petitioner relies on the Declaration testimony of Dr. William Kerr (Ex. 1119).

Objective indicia of non-obviousness play an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). “[E]vidence of secondary considerations may often be the most probative and cogent evidence in the record.” *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). “[E]vidence rising out of the so-called ‘secondary considerations’ must always when present be considered en route to a determination of obviousness.” *Id.* at 1538. “For objective evidence . . . to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.” *In re Kao*, 639 F.3d 1057, 1068 (Fed.Cir.2011) (quoting *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed.Cir.2010)) (emphasis omitted) (internal quotation marks omitted).

Patent Owner offers evidence it asserts shows objective evidence of non-obviousness (PO Resp. 45–46) in the form of commercial success (*id.* at 46), long-felt and unresolved need (*id.*), skepticism of the inventions by Patent Owner’s management (*id.*), unexpected results (*id.*), and copying

petitions and Patent Owner responses. *E.g.*, see *Fidelity National Information Services, Inc. v. DataTreasury Corp.*, IPR2014-00489, Paper 9, slip op. at 9–10 (PTAB Aug. 13, 2014) (“We, therefore, decline to consider information presented in a supporting declaration, but not discussed sufficiently in a petition; among other reasons, doing so would permit the use of declarations to circumvent the page limits that apply to petitions.”). Here, we exercise our discretion to address Patent Owner’s argument and evidence concerning “secondary considerations.”

by competitors (*id.*). Patent Owner recognizes there must be a nexus between the objective evidence and the merits of the claimed invention. To establish nexus, Patent Owner asserts “use of Victaulic’s Style 009 couplings,” when assembled in accordance with Victaulic’s instructions, “is covered by the ’165 patent claims.” *Id.*

We have reviewed the arguments and evidence cited in these papers.

a. Nexus

For objective indicia evidence to be accorded substantial weight, “a nexus must exist ‘between the evidence and the merits of the claimed invention.’” *Novartis Ag V. Torrent Pharmaceuticals*, No. 2016-1352, slip op. at 24, Fed. Cir. April 12, 2017) (citing *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010)).

Patent Owner relies on one specific product, its “Style 009” coupling, to establish nexus. PO Resp. 46 (citing Ex. 2006 ¶¶ 13–15). Mr. Thau, on whose testimony Patent Owner relies, was employed by Patent Owner for 42 years. Ex. 2006 ¶ 2. He started as a Project Engineer and retired as Executive Vice President and Chief Technical Officer. *Id.* He retired from Patent Owner in 2015 and is now a “retained consultant” of Patent Owner. *Id.* at ¶ 1.

To establish nexus, Mr. Thau relies on drawings of the Style 009 coupling (Ex. 2005, Ex. B); installation instructions for the Style 009 (*id.* at Ex. C); and a comparison of the claims to the Style 009 coupling when used in accordance with Victaulic’s instructions (*id.* at Ex. D). Mr. Thau’s testimony also refers to a sales chart comparing sales of the Style 009 coupling to its predecessor, the Style 005 coupling (*id.* at Ex. E); and price comparison charts for the Style 009 and Style 005 (*id.* at Ex. F).

Petitioner acknowledges that Patent Owner must establish a nexus between the evidence and the claimed invention, but does not challenge Patent Owner's evidence that a nexus exists in this case. Pet. Reply 23

“Questions of nexus are highly fact-dependent ‘It is within the province of the fact-finder to resolve these factual disputes regarding whether a nexus exists between commercial success of the product and its patented features, and to determine the probative value of evidence of secondary considerations.’” *WBIP*, 829 F.3d at 1331 (citing *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1574 (Fed. Cir. 1996)).

We recognize that it is the claimed combination as a whole that serves as a nexus for the objective evidence. *WBIP*, 829 F.3d at 1330; *see also id.* at 1332 (stating that this is especially true for a combination of elements that were known individually in the prior art, because commercial success may be linked to the inventive combination of known elements).

We determine that sufficient evidence establishes that the Style 009 coupling is an embodiment of the claimed invention and that the proffered objective evidence relates to these products. This is sufficient to establish nexus for the objective considerations at issue in this case. Establishing nexus, however, does not establish commercial success or other objective indicia of patentability. *In re Kao*, 639 F.3d at 1067 (when secondary considerations are present, “they are not always dispositive”); *see also Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1372 (Fed.Cir.2007) (“Although secondary considerations must be taken into account, they do not necessarily control the obviousness conclusion.”).

We consider below the objective evidence of non-obviousness asserted by Patent Owner. We then consider the totality of the evidence in our conclusion on the patentability of claims 2, 5, 6, 10, 13, and 14.

b. Commercial Success

Patent Owner asserts its Style 009 couplings “have been very successful commercially.” PO Resp. 46 (citing Ex. 2006 ¶¶ 16–18). Mr. Thau relies, in part, on comparing sales of the Style 009 coupling to its predecessor, the Style 005 coupling. Ex. 2006 ¶ 17. The Style 005 couplings are couplings installed by the traditional method not the method claimed in the ’165 patent. *Id.* Use of the Style 005 coupling is not covered by any of the ’165 patent claims. *Id.*

Mr. Thau testifies that sales of the Style 009 coupling have been “greatly increasing” while sales of the Style 005 coupling have been “steadily decreasing.” *Id.* at ¶ 18 (citing Ex. 2006, Ex. E (confidential)). Mr. Thau also states that the Style 009 couplings and the Style 005 couplings have been “equally advertised, marketed and promoted,”⁷ and historically the prices of the Style 009 couplings and the Style 005 couplings have been “comparable.” *Id.* The evidence supports increasing sales. *See* Ex. 2006, Ex. E. The evidence does *not* support historically comparable prices. *See* Ex. 2006, Ex. F.

Exhibit F of Mr. Thau’s Declaration is a series of five charts comparing the “list price” of five different sizes of the Style 005 and Style 009 couplings. All five charts are consistent and show that but for a short period when the Style 009 coupling was introduced, the Style 009 coupling has been consistently *less expensive* than the Style 005 coupling. The price

⁷ Mr. Thau does not provide any facts or data to support this statement.

differential between the two couplings has been increasing from about 2008/2009 through about mid-2016, the last period of reported data. Based on the most current data, the price differential is that the Style 009 coupling is about 10% *less expensive* than the Style 005 coupling. *E.g.* Ex. 2006, 49 (Ex. F, chart for the 1.5” coupling) (showing a list price of about \$52 for the Style 009 and a list price of about \$59 for the Style 005). Thus, the alleged new and improved coupling is less expensive than the old, traditional coupling.

Dr. Kerr, testifying on behalf of Petitioner takes a different view of Patent Owner’s alleged commercial success. Dr. Kerr is an economist who specializes in the economics of competition and intellectual property. Ex. 1119 ¶ 2. Dr. Kerr’s opinion is that “there is no evidence to show that the claimed invention was the source of the commercial success” of the Style 009 coupling. *Id.* ¶ 8. Dr. Kerr testifies that he has “not found any evidence that shows *any* specific feature contributed to the sales and commercial success of the 009 couplings.” *Id.* Dr. Kerr’s view is that “[t]he general coupling market is a commodity market, where typically price is the primary driver of sales.” *Id.* He observes that “[s]ales of the 009 couplings increased substantially after the price of the 009 coupling declined relative to the price of its predecessor, the 005 coupling.” *Id.*; *see also* ¶¶ 19–31 (analyzing the market and concluding the rise in sales occurred when prices declined). This opinion is consistent with the data presented by Mr. Thau. Based on this evidence, Dr. Kerr concludes that “a lower price drove the increase in sales.” *Id.* at ¶ 8.

Based on our analysis of the evidence, we determine that the evidence does not establish that the Style 009 coupling was commercially successful

because of the merits of the claimed invention. Based on the evidence, the increased sales of the Style 009 coupling compared to sales of the Style 005 coupling appear to be based on the fact that the Style 009 had a lower price. There is no persuasive evidence that the commercial success alleged is derived from the invention claimed. There is no evidence, for example, that the Style 009 garnered an increased market share over that previously achieved by the Style 005. There is no evidence that the combined market share of the Style 009 and Style 005 was any better than the market share of the Style 005 alone, prior to the Style 009. The increased sales of the new model Style 009 may have cannibalized sales from the old model Style 005, which would provide sales curves showing increasing sales of the Style 009 and decreasing sales of the Style 005. Such sales curves are not particularly persuasive of commercial success of a claimed invention, particularly coupled with evidence that the new and allegedly improved product was less expensive than the old product.

Accordingly, the evidence of commercial success has minimal probative weight.

c. Long Felt Need

Long-felt need can be shown by evidence that indicates that the prior art had a recognized need for a solution to the problem and that others had tried and failed to find a solution to that problem. *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1325 (Fed. Cir. 1999); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1540 (Fed. Cir. 1983). Notably, the case law characterizes the need in terms of a long-felt but *unresolved* need. *Al-Site*, 174 F.3d at 1325 (discussing “long felt but unresolved needs”).

Accordingly, Patent Owner must show that the need was both known and not resolved.

Patent Owner alleges that the Style 009 coupling and its method of use solved a long felt and unresolved need for couplings that could be quickly installed with minimal skill level, and installed without any disassembly. PO Resp. 29 (citing Ex. 2006 ¶¶ 21–31). As noted by Mr. Thau, the Examiner considering the reexamination of a related patent has rejected this assertion on the basis that one cannot claim to have discovered a solution which is already taught by the prior art. Ex. 2006 ¶ 26.

Petitioner asserts preassembled coupling are in the prior art, and therefore there was no longstanding need. Pet. Reply 26.

As discussed above, both Lewis and Lane are pre-assembled couplings.

Accordingly, there is no persuasive evidence of a long-felt but unresolved need.

d. Skepticism by Patent Owner's Management

Patent Owner asserts “knowledgeable persons in Victaulic were skeptical of the inventions defined by the ’165 patent claims. PO Resp. 46 (citing Ex. 2006 ¶ 32). Mr. Thau summarizes the concerns of Patent Owner’s management in developing the Style 009 coupling. Ex. 2006 ¶ 32. Among the factors Mr. Thau identifies are concerns about the size and cost of the gasket used and performance requirements of the gasket. *Id.* The invention recited in independent claims 1 and 9, and most of the dependent claims, does not include a gasket. Mr. Thau also states Patent Owner’s management had concerns about manufacturing a deformable coupling because *Patent Owner* had not done so previously; concerns about shipping

and handling of a pre-assembled coupling; and concerns that distributors and customers would be reluctant to maintain additional inventories of a new product. *Id.*

Evidence of *industry* skepticism weighs in favor of non-obviousness. *WBIP*, 829 F.3d at 1335. If *industry participants* or *skilled artisans* are skeptical about whether or how a problem could be solved or the workability of the claimed solution, it favors non-obviousness. *Id.* There is no persuasive evidence that skilled artisans or the “industry” were skeptical of workability of a pre-assembled, deformable coupling as claimed in the claims in this proceeding. Mr. Thau provides evidence that Patent Owner’s management was reluctant to “fund the commercial development” of the new coupling based on factors that had little to do with the merits of the claimed invention. *Id.*

As Petitioner notes, there is no persuasive evidence on skepticism by persons of ordinary skill in the relevant technology. Pet. Reply 26–27 (citing *Power Integrations Inc. v. Fairchild Semiconductor Int’l Inc.*, 711 F.3d 1348, 1368 (Fed. Cir. 2013)).

We assign little probative weight to the evidence of skepticism.

e. Unexpected Results

Patent Owner asserts the Style 009 couplings led to unexpected results. PO Resp. 46 (citing Ex. 2006 ¶ 33). According to Mr. Thau, the unexpected results were cost savings in installing coupling, fewer lost nuts and bolts, and thus, less opportunity to replace the lost nuts and bolts with the wrong sized parts. These results also would apply to any pre-assembled coupling, which were well-known in the prior art.

We assign little probative weight to the evidence of unexpected results.

f. Copying

Patent Owner asserts the “claimed invention was copied by competitors.” PO Response 46 (citing Ex. 2006 ¶¶ 34–36). Mr. Thau testifies that a competitor, Anvil, copied “the inventions defined by the 165 patent.” Ex. 2006 ¶ 34. According to Mr. Thau, he compared claims 1–4, 8–12, and 16 to the Anvil product and concludes the Anvil product is a “copycat coupling.” *Id.* at ¶ 35 (“Exhibit J is my comparison of claims 1–4, 8–12, and 16 of the 165 patent to use of the SlideLOK couplings in accordance with Anvil's instructions.”).

For copying to be effective in showing non-obviousness, there must be more than simply a competing version of the product. *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004) (“Not every competing product that arguably falls within the scope of a patent is evidence of copying. Otherwise every infringement suit would automatically confirm the nonobviousness of the patent.”). Evidence of copying can be particularly persuasive when a competitor had tried and failed to introduce a competing product until the patented product became available. *Vandenberg v. Dairy Equipment Co., a Div. of DEC Int’l, Inc.*, 740 F.2d 1560, 1567 (Fed. Cir. 1984). We have no such evidence in this case.

Merely offering competing products or alleging infringement are not signs of non-obviousness. *Wyers v. Master Lock*, 616 F.3d at 1246 (Fed. Cir. 2010). The secondary consideration of copying is very specific—“evidence of efforts to replicate a specific product.” *Id.* This specifically is

not evidence of efforts to provide a competing product or evidence of a product having the same features, or we would be reading out the crux of the basis for the court's reasoning in Wyers, that "[n]ot every competing product that arguably falls within the scope of a patent is evidence of copying."
Id.

Here, we have no evidence of efforts to replicate a specific product. Thus, the evidence on which Patent Owner relies has no probative weight of copying.

g. Conclusion Regarding Objective Evidence

Based on the analysis above, we find a nexus between the asserted objective evidence and the '165 patent. However, considering the totality of objective evidence before us, we determine that the objective evidence has little if any probative weight in support of patentability of claims 2, 5, 6, 10, 13, and 14.

h. Conclusion Regarding Patentability of Claims 2, 5, 6, 10, 13, and 14

Based on the totality of evidence before us and the analysis above, we are persuaded that a preponderance of the evidence establishes that claims 2, 5, 6, 10, 13, and 14 would have been obvious to one of ordinary skill in the art.

III. CONCLUSION

Based on the analysis above, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–6, 8–14, and 16 would have been obvious in view of Lewis and Lane.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 3, 4, 8, 9, 11, 12, and 16 of the '165 patent are unpatentable under 35 U.S.C. § 102 based on Lewis;

FURTHER ORDERED that claims 5, 6, 13, and 14 are unpatentable under 35 U.S.C. § 103 based on Lewis;

FURTHER ORDERED that claims 2 and 10 are unpatentable under 35 U.S.C. § 103 based on Lewis and Lane; and

FURTHER ORDERED that this is a Final Written Decision under 35 U.S.C. § 318(a), and that parties to the proceeding seeking judicial review of the decision under 35 U.S.C. § 319 must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 8,646,165 B2

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