

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PCT INTERNATIONAL, INC.,
Petitioner,

v.

AMPHENOL CORPORATION,
Patent Owner.

Case IPR2013-00229
Patent 7,544,094 B1

Before BRIAN J. McNAMARA, JAMES B. ARPIN, and
MIRIAM L. QUINN, *Administrative Patent Judges*.

QUINN, *Administrative Patent Judge*.

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

I. BACKGROUND

PCT International, Inc. (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 1–13 and 16–18 of U.S. Patent No. 7,544,094 B1 (“the ’094 patent”) pursuant to 35 U.S.C. §§ 311-319. Paper 3 (“Pet.”). We granted the Petition and instituted trial for all asserted claims. Paper 9 (“Dec. on Inst.”). Although Petitioner proposed five grounds of unpatentability, we instituted trial on three grounds:

- a) anticipation of claims 1, 3–5, 7, 8, 10, and 16–18 by Smith;¹
- b) obviousness of claims 1–13 and 16–18 over Burris ’509² and the knowledge of a person of ordinary skill in the art; and
- c) obviousness of claims 1–13 and 16–18 over Burris ’509 and Smith.

During trial, Amphenol Corporation (“Patent Owner”) filed a Patent Owner Response (Paper 15, “PO Resp.”) addressing the three obviousness grounds and relying on the Declaration of Thomas G. Elliot (Ex. 2003). Petitioner filed a Reply to Patent Owner’s Response. Paper 22 (“Pet. Reply”).

An oral hearing was held on June 17, 2014, and a transcript of the hearing is included in the record. Paper 29 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(c). This final written decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–13 and 16–18 of the ’094 patent are unpatentable.

¹ U.S. Patent No. 5,297,458 (“Smith”) (Ex. 1007).

² U.S. Patent No. 7,147,509 B1 (“Burris ’509”) (Ex. 1005).

A. THE '094 PATENT (EXHIBIT 1001)

The '094 patent, titled “Connector Assembly with Gripping Sleeve,” issued on June 9, 2009, based on Application 12/003,109, filed on December 20, 2007.

The '094 patent relates to “connector assemblies with a sleeve . . . to facilitate gripping and mating of a connector to its counterpart connector.” Ex. 1001, col. 1, ll. 15–18. The patent describes the problem with connector assemblies having a rotating nut that engages corresponding threads of another structure. *Id.* at col. 1, ll. 22–28. Specifically, the '094 patent describes avoiding a loose connection of the nut by fully twisting the nut onto the corresponding threads. *Id.* at col. 1, ll. 29–37. A user may fail to mate the connector properly because of a poor grip. *Id.* at col. 1, ll. 40–46.

The '094 patent describes one embodiment of a connector with a sleeve that facilitates the mating of the connector. *Id.* at col. 3, ll. 28–29. Figure 1 of the '094 patent, reproduced below, depicts a view of a connector assembly according to one embodiment. *Id.* at col. 2, ll. 43–45.

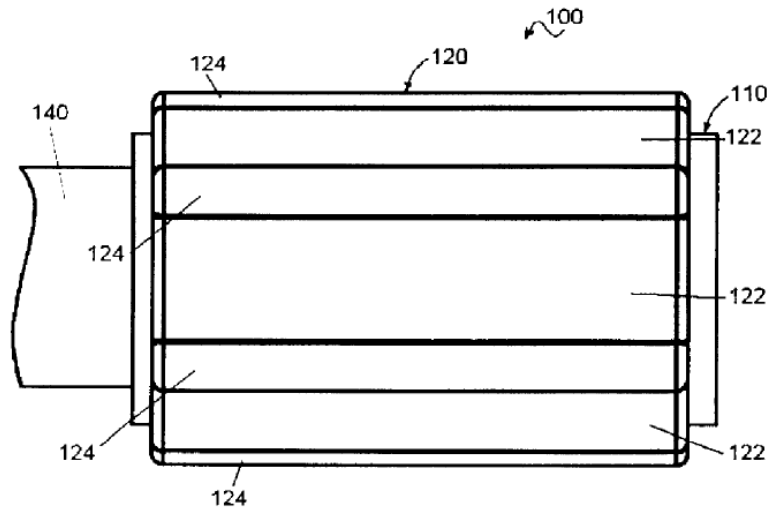


FIG. 1

As illustrated in Figure 1 above, connector assembly 100 includes connector 110 and sleeve 120. *Id.* at col. 3, ll. 17–18. “The connector 110 terminates a cable 140 and connects to a mating connector, device, or cable.” *Id.* at col. 3, ll. 18–20. “The sleeve 120 can be sized to allow a user to achieve high levels of torque when mating the connector 110 with another device or connector without the use of tools.” *Id.* at col. 3, ll. 40–42.

The '094 patent explains that connector 110 has a first end and a second end, illustrated as items 112 and 114, respectively, in Figure 2. *Id.* at col. 3, ll. 57–60. The sleeve and the first end rotate or move together with respect to the second end, which does not rotate when the sleeve is rotated, because the second end is fixed to the cable. *Id.* at col. 4, ll. 10–18. The '094 patent also explains that the inner bore of the sleeve can include a retaining member that prevents the sleeve from slipping off the connector. *Id.* at col. 5, ll. 23–26.

B. ILLUSTRATIVE CLAIM

Challenged claims 1 and 10 of the '094 patent are the only independent claims at issue. Claim 1 is illustrative and is reproduced below.

1. A connector assembly, comprising of:

an electrical connector having opposite first and second ends, said first end being rotatable with respect to said second end and configured to couple to a mating connector, said second end being configured to terminate a cable; and

a sleeve having an outer gripping surface and an inner bore that receives said first and second ends of said electrical connector, said sleeve and said first end of said connector being rotatable together with respect to said second end of said connector, and said inner bore including a retaining member configured to substantially prevent axial movement of the electrical connector with respect to said sleeve;

wherein said first end is in direct contact with said second end.

II. ANALYSIS

A. CLAIM INTERPRETATION

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Claim terms also are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). We must be careful not to read a particular embodiment appearing in the written description into the claim if the claim language is

broader than the embodiment. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (“limitations are not to be read into the claims from the specification”).

In the Decision on Institution, we interpreted various claim terms of the '094 patent as follows:

Table 1

Term	Interpretation
“sleeve”	an encasement into which an object fits
“first end”	end of the connector that rotates and that couples to a mating connector
“second end”	the end of the connector that terminates a cable
“retaining member”	a structure for holding in position
“ensnare”	to catch in
“radial flange”	a rim or edge configured along a radius

Dec. on Inst. 7–12. Patent Owner does not challenge directly our construction of the above-listed terms. Nevertheless, reviewing Patent Owner’s arguments regarding alleged differences between the prior art and the challenged claims, we determine that the scope of “sleeve” is in dispute. Accordingly, we resolve the issue before delving into a comparison between the challenged claims and the prior art at issue.

a. Sleeve

We have construed “sleeve” to mean “an encasement into which an object fits.” Dec. on Inst. 7–8. Patent Owner argues that our interpretation is too broad because it is inconsistent with the specification. PO Resp. 20. According to Patent Owner, the claimed sleeve must “enclose the first and second ends of the connector” in order for it to be an encasement. *See id.* at 19 (arguing that the prior art would not be considered an encasement because it does not enclose the first and second ends of the connector). To support this argument, Patent Owner submits a dictionary definition of the word “encasement”—which is not a term recited in the claims. *See id.* (citing WEBSTER’S II NEW RIVERSIDE UNIVERSITY DICTIONARY, 429 (1984) (Ex. 2005) (definition of “encase”: “[t]o enclose in or as if in a case”)). Surrounding the first and second end is insufficient, according to Patent Owner. *Id.* These arguments are unpersuasive, however, because they are impermissibly narrow and do not comport with the broadest reasonable interpretation of the claims in the context of the specification.

Patent Owner’s argument is centered on whether the second end, which is configured to terminate the cable, is enclosed in the sleeve. At oral hearing, Patent Owner clarified its contention that, although the entire length of the second end need not be enclosed, the sleeve must enclose the part of the connector that has the mechanism for terminating the cable. Tr. 17. This contention finds no support in the claim language. Claim 1 recites that the sleeve’s inner bore “*receives* said first and second ends of said electrical connector” (emphasis added). Claim 10 commensurately recites this language. Although the sleeve must encase an object (e.g., a first and

second end of the connector), there is no recited requirement of how much of the second end must be *received* by that inner bore. Further, the cited dictionary definition of “encasement” does not define any degree of enclosure. See Ex. 2005.

The specification confirms our interpretation, as it explains that to insert the second end into the sleeve’s inner bore, the bore “is sized to receive the second end 114 of the connector 110 freely.” Ex. 1001, col. 7, ll. 13–14; Fig. 9. This passage aligns with the claim language, confirming that the inner bore must be able to accommodate the insertion of the second end. The claims, however, are silent regarding how far into the sleeve the second end must reach or be encased. On this point, we find instructive that claim 11, which depends from independent claim 10, recites a “sleeve” that has “an elongated body having opposite ends.” Ex. 1001, col. 9, ll. 6–8. Therefore, we are persuaded that the claimed “sleeve,” although sized to receive the second end, has no particular length to enclose the mechanism in the second end that terminates the cable.

Further, we are unpersuaded that, just because the second end is configured to terminate a cable, the “sleeve” must enclose the termination. Claim 1 recites that the second end is “configured to terminate a cable”—this points to the size and the function of the second end vis-à-vis the cable, not the “sleeve.” Such a claim phrase does not define the extent of the second end that the sleeve must enclose. Accordingly, we are not persuaded by Patent Owner’s argument narrowly interpreting “sleeve” to require enclosing the mechanism in the second end that terminates the cable. Tr. 17.

b. Assembly

Patent Owner argued that “assembly,” although a preamble term, is a claim limitation that distinguishes the recited subject matter over the prior art. PO Resp. 16-18, 21-22. At the oral hearing, however, Patent Owner withdrew its contentions regarding that term’s meaning and its impact in the case. Tr. 15. Therefore, we do not address “assembly” or the parties’ contentions regarding that term any further.

c. Remaining Claim Terms

As for the meaning of all other disputed terms, we conclude, consistent with our analysis in our Decision on Institution at pages 7–12, that the constructions stated in Table 1, above, represent the broadest reasonable interpretation of the claim language in light of the specification, and they are adopted here.

B. PATENTABILITY OF ORIGINAL CLAIMS

To prevail in its challenges to the patentability of claims, the Petitioner must establish facts supporting its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is anticipated, and, thus, unpatentable, if a single prior art reference discloses each and every element of the claimed invention. *See Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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 skill in the art; and (4) where in evidence, so-called secondary considerations including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966) (“the *Graham* factors”). The level of ordinary skill in the art usually is evidenced by the references themselves. See *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

For an obviousness analysis, prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (quoting *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). Moreover, “it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). That is because an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; see also *In re Translogic Tech., Inc.*, 504 F.3d at 1259.

Regarding commercial success, this factor “may have relevancy” to the overall obviousness determination (*Graham*, 383 U.S. at 18), but a nexus must exist between the commercial success and the claimed invention.

Ormco Corp. v. Align Tech., Inc., 463 F.3d 1299, 1311–12 (Fed. Cir. 2006) (“Evidence of commercial success . . . is only significant if there is a nexus between the claimed invention and the commercial success.”). If commercial success is due to an element in the prior art, no nexus exists. *Id.* at 1312; *see also Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1580 (Fed. Cir. 1983) (holding claimed invention obvious where patent holder “failed to show that such commercial success . . . was due to anything disclosed in the patent in suit which was not readily available in the prior art”). We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

C. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner alleges that a person of ordinary skill in the art in the field of the '094 patent is someone with an undergraduate degree in mechanical or electrical engineering and with two years of experience designing electrical connectors, or equivalent work experience. Pet. 6. Such a person also has knowledge of patents and publications in the field of electrical connectors, as well as other relevant connectors. *Id.* (citing Ex. 1001, col. 3, ll. 25–27). Patent Owner proffers the testimony of Thomas G. Elliot regarding the skill in design, manufacture, testing, and use of coaxial connectors by a person of ordinary skill in the art. *See* Ex. 2003 ¶ 4. In particular, such a person would have an undergraduate degree in engineering and at least two years of experience in the design, manufacture, testing, and use of coaxial connectors for Radio Frequency (“RF”) transmission. *Id.*

We cannot find in Patent Owner’s brief any explanation for how the claims of the '094 patent are specific to connectors for RF transmission. Neither the recitations in the claims nor the subject matter described in the

specification limits the scope of the ordinary skill to RF connectors. *See* Ex. 1001, col. 4, ll. 40–46 (identifying BNC, TNC, N, and SMA connectors as alternatives). Accordingly, we are not persuaded that the level of ordinary skill in the art would have experience limited to RF connectors. As for the requisite training and knowledge, both parties agree that an ordinarily skilled artisan would have an undergraduate degree in engineering and two years of relevant experience with connectors. Based on our review of the '094 patent specification, which is directed to an electrical connector assembly with a sleeve to facilitate gripping and mating of a connector (Ex. 1001, col. 1, ll. 15–18), we are persuaded that such a level of ordinary skill in the art is appropriate in this case.

D. ANTICIPATION BY SMITH

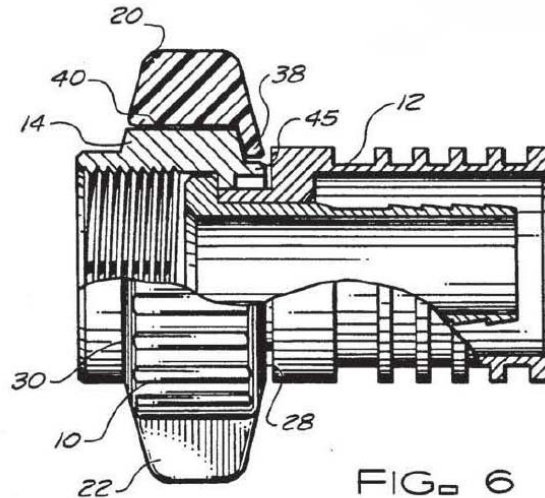
With respect to the alleged grounds of unpatentability based on anticipation by Smith, we have reviewed the Petition, the Patent Owner Response, and Petitioner's Reply, as well as the relevant evidence discussed in each of those papers. We are persuaded, by a preponderance of the evidence, that claims 1, 3–5, 7, 8, 10, and 16–18 are anticipated by Smith under 35 U.S.C. § 102(b).

We first establish the scope and content of Smith, by way of a summary as stated below.

1. Overview of Smith (Exhibit 1007)

Smith discloses a torque wrench installed on an electrical cable connector for fastening the connector to a counterpart by applying a torque. Ex. 1007, Abstract. The wrench is a ring-shaped collar with at least two fins extending outwardly from the collar. *Id.* The interior of the wrench is

hollow and dimensioned to tightly mate with the connector on which it is installed. *Id.* Figure 6 of Smith, reproduced below, depicts an embodiment of the wrench installed on an electrical connector. *See id.* at col. 3, ll. 7–9.



As shown in Figure 6, Smith discloses a connector (item 12), which is a conventional “F” connector, having a tightening surface illustrated as a hexagonal nut (item 14). *Id.* at col. 3, ll. 25–28. Wrench (item 10, Fig. 6) mates with connector 12, and particularly with hexagonal nut 14. *Id.* at col. 4, ll. 18–22. The wrench also includes an aft section (item 38, Fig. 6), close to the back side (labeled 28, Fig. 6) of the wrench. *Id.* at col. 4, ll. 33–36. This aft section is configured to prevent the connector’s movement through the wrench by restricting the size of the hollow interior of the wrench. *Id.* at col. 4, ll. 54–59. Aft section 38 also is configured to mate with sleeve portion 45, which resides behind nut 14.

2. Comparison of Smith and Claims 1 and 10

The independent claims recite six structures: “electrical connector,” “first end,” “second end,” “sleeve,” “retaining member,” and “inner bore.”

Except for the “sleeve,” Patent Owner does not dispute that Smith discloses these structures as recited in claims 1 and 10.³ In particular, Patent Owner contends that Smith’s “wrench” does not meet the “sleeve” limitation. PO Resp. 18–21. Two arguments are advanced for the contention: (1) alleged testimony of Petitioner’s declarant that a “wrench” is not a “sleeve,” and (2) characterization of the size of Smith’s wrench as insufficient to be an encasement, i.e., a “sleeve.” *Id.* We are unpersuaded by these arguments.

Patent Owner characterizes the testimony of Petitioner’s declarant as being in agreement with the contention that the wrench disclosed in Smith is not a “sleeve.” *Id.* at 19. First, Dr. Dickens, Petitioner’s declarant, when referring to using tools with torque-assisting sleeves, testified that “[w]e didn’t call it a wrench because it was more like a sleeve.” Deposition Transcript of Dr. James C. Dickens, Ex. 2002, 29:23–24. Taking his testimony as a whole, however, we note that Dr. Dickens was not certain what the tool was called, e.g., he did not think it was referred to as either a sleeve or a wrench. *See id.* at 30:6–13. Further, the cited testimony pertains to Dr. Dickens’ experience in general with tools; it does not concern Smith’s wrench. As for Dr. Elliot, Patent Owner’s declarant, his testimony that he has “[n]ever . . . heard or considered a wrench to be a sleeve and vice versa” is focused on whether the Smith wrench is an accessory—an unrecited feature that is irrelevant to the determination of whether Smith wrench meets the “sleeve” limitation. *See* Ex. 2003 ¶ 18. Nevertheless, the structure and

³ We note that, although the Patent Owner Response includes an argument distinguishing Smith over the claims because of the “assembly” recited in the preamble, Patent Owner abandoned that argument at oral hearing. *See* Tr. 15.

function of—not the label put on—Smith’s wrench is the focus of our inquiry. Moreover, even if a person of ordinary skill in the art were to consider Smith’s wrench akin to the “conventional” wrench (*see, e.g.*, Ex. 1007, col. 1, ll. 61–64), Smith’s wrench may also be a “sleeve” because of how Smith describes the wrench’s structure and function.

As for Patent Owner’s second argument that Smith’s wrench is not an encasement, we rejected above the distinctions drawn by Patent Owner that “encasement” required more enclosure than that provided by Smith’s wrench. PO Resp. 18–21. We construed “sleeve” as an encasement into which an object fits. And we determined that the term was not limited to an enclosure of a particular length of the second end. *Id.* at 8. Applying our construction of “sleeve,” we find that Smith’s wrench is a “sleeve.”

First, we note that Smith’s disclosure of the wrench is not limited to the label on that structure. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) (Anticipation is not an “ipsissimis verbis” test, i.e., identity of terminology is not required.). Smith describes the problems and differences of using “conventional” wrenches (Ex. 1007, col. 1, ll. 61–64; col. 7, ll. 1–9) in comparison with the “improved” torque wrench associated with the connector (*id.* at col. 2, ll. 25–37). We find that wrench 10 is configured to fit on the nut of a coaxial cable, such that a tightening torque or loosening torque can be applied through a user’s fingers. *Id.* at col. 5, l. 6–col. 6, l. 19. Wrench 10, in accordance with the construction of “sleeve,” also encases the nut and a portion of the connector where the cable is terminated. *Id.* at Fig. 6 (illustrating area underneath sleeve 45 and portion of connector 12 under nut 14); col. 4, ll. 59–61. Further, concerning the recitation that the inner bore of the “sleeve” receive first and second ends of the connector, we find

example, Smith's connector 12 discloses the claimed "connector," nut 14 discloses the "first end," aft section 38 discloses the "retaining member" and part of the "inner bore" that retains the electrical connector, and part of connector 12, beginning where marked in the annotated Figure 6 above and ending where the body of the connector ends, discloses the claimed "second end." Pet. 20–23 (citing Exhibit 1007 as supporting evidence).

3. Conclusion Regarding Unpatentability of Claims 1, 3–5, 7, 8, 10, and 16–18 as Anticipated by Smith

Based on the evidence presented, we find that Petitioner has proven by a preponderance of the evidence that Smith discloses each and every element recited in independent claims 1 and 10. Because Smith discloses each and every element "arranged or combined in the same way as in the claim," Smith anticipates independent claims 1 and 10. *Net-MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008).

Patent Owner did not challenge Petitioner's assertion of unpatentability with regard to the additional limitations found in dependent claims 3–5, 7, 8, and 16–18. See PO Resp. 21. Having reviewed Petitioner's evidence of unpatentability for those dependent claims (Pet. 25–26, 28; Ex. 1007), we conclude that Petitioner also has proven by a preponderance of the evidence that claims 3–5, 7, 8, and 16–18 are unpatentable as anticipated by Smith.

E. OBVIOUSNESS OVER BURRIS '509

We instituted trial of claims 1–13 and 16–18 on two obviousness grounds based on Burris '509. The first ground involves the combination of Burris '509 and the common knowledge of a person of ordinary skill in the art and the second ground involves Burris '509 in combination with Smith.

Having reviewed the Petition, the Patent Owner Response, and Petitioner's Reply, as well as the relevant evidence discussed in each of those papers, we are persuaded, by a preponderance of the evidence, that claims 1–13 and 16-18 are rendered obvious under 35 U.S.C. § 103(a).

We first summarize the teachings in Burris '509.

1. Overview of Burris '509 (Exhibit 1005)

Burris '509 is directed to a coaxial connector torque aid, in the form of a tubular grip element installed over a conventional coaxial connector to facilitate tightening of the connector onto an equipment port by hand. Ex. 1005, Abstract. An embodiment of the coaxial connector with the tubular grip element in a fully-installed position is further depicted in Figure 6 of Burris '509, reproduced below. *Id.* at col. 3, ll. 65–67.

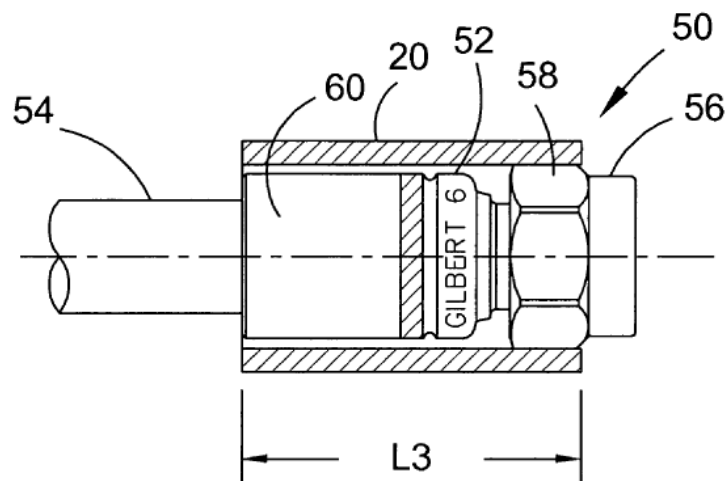


FIG.6

Figure 6 shows tubular grip element 20 with an axial length longer than that of hexagonal band 58 of nut 56. *Id.* at col. 6, ll. 29–31. By extending the gripping area beyond the surface of hexagonal band 58, tubular grip element 20 of Burris ’509 allows a user to “exert greater leverage when rotating coupling nut 56.” *Id.* at col. 6, ll. 34–38.

Burris ’509 further describes that the inner bore of the tubular grip element fits over the body 52 of the connector. *Id.* at col. 5, ll. 56-62. The dimension of the inner bore is slightly smaller than the dimension of the hexagonal band 58 to firmly secure the tubular grip element onto the band, through a press-fit engagement. *Id.* at col. 6, ll. 9-20. The end of the connector with the nut is rotatably secured on the body for securing the connector onto a coaxial port, while the other end of the connector is configured to receive a prepared end of a coaxial cable 54. *Id.* at col. 5, ll. 23-28.

2. Differences Between Burris ’509 and Claims 1 and 10

Burris ’509 teaches all of the recited limitations of claims 1 and 10, except for the “retaining member” of claim 1 and the portion of the “inner bore being configured to retain said electrical connector in said inner bore” of claim 10. Claim 1 recites that the “retaining member” be “configured to substantially prevent axial movement of the electrical connector” with respect to the sleeve. Ex. 1001, col. 8, ll. 29–31. Petitioner argues that Burris ’509 describes rib 92, in Figure 16 reproduced below, as a structure inside the tubular grip element that teaches the “retaining member” and the “inner bore” configured to retain. Pet. 41. Patent Owner disputes that the

described rib either retains or prevents axial movement of the electrical connector. PO Resp. 22–24.

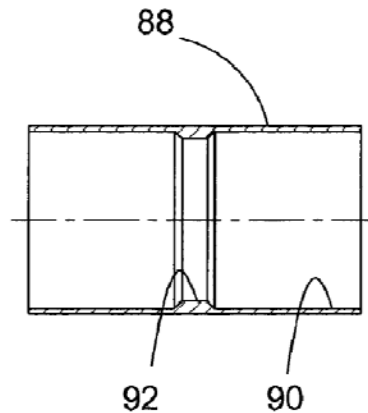


FIG.16

Figure 16 illustrates “[a] reduced diameter internal rib 92 [] formed by the inner wall approximately midway within the central passage 90.”

Ex. 1005, col. 8, ll. 1–3. Burris ’509 further describes that “[r]ib 92 serves to increase the wall thickness, and hence, the strength of tubular grip element 88, and helps to prevent the collapse of tubular grip element 88 against the connector body as a user rotates tubular grip element 88 to tighten the coupling nut to an equipment port.” *Id.* at col. 8, ll. 3–7.

The structure and function of the rib in Burris ’509 has been analyzed by both parties’ declarants. On the one hand, Petitioner’s declarant, Dr. Dickens, explains that a known problem of losing parts of a connector would have motivated a person of ordinary skill in the art to look for a solution and that a person of ordinary skill in the art would recognize that one solution is to adapt the rib depicted in Figure 16 of Burris ’509. Pet. 39–42 (citing Ex. 1008 ¶¶ 23–27). On the other hand, Patent Owner’s declarant, Mr. Elliot,

opines that the rib is intended only as support for thin walls of a tubular grip element to avoid collapse, and, thus, a person of ordinary skill in the art would not consider the rib a “retaining member.” PO Resp. 23–24 (citing Ex. 2003 ¶¶ 20–23).

Even though the function of the rib structure disclosed in Burris ’509 is for providing support, not for retaining the electrical connector or for preventing axial movement, we find, nevertheless, that it was known to include such a structure in the inner bore of a “sleeve.” As for whether a person of ordinary skill in the art would have been motivated to configure the rib structure to retain or to prevent axial movement, we note not only what the art teaches, but also the inferences that may be drawn by a person of ordinary skill in the art with creativity. *KSR*, 550 U.S. at 418. The motivation in Burris ’509, namely, to add strength, is relevant to show there was a known benefit of including such a rib structure in the interior of a sleeve. See *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1323 (Fed. Cir. 2005) (“One of ordinary skill in the art need not see the identical problem addressed in a prior art reference to be motivated to apply its teachings.”).

Further, we are persuaded that the record includes additional evidence of circumstances that would motivate a person of ordinary skill in the art to include in Burris ’509 a retaining member. For example, Petitioner has shown sufficiently that the problem of losing parts of a connector was known and that radial flanges were known to prevent objects from slipping off connector bodies. Pet. 42–43. Petitioner has also proven that, before the time of the invention, safety concerns with regards to lost connector parts were widespread. Pet. Reply 9. It would have been in the course of creative

application of known techniques and mechanical elements to arrive at a Burris '509 tubular grip that included a retaining member for retaining the electrical connector or for preventing axial movement. Such a retaining member, e.g., a flange, was a known mechanical structure and was known to be used as a retaining member. For example, as discussed above with regard to Smith, aft section 38, in Smith's wrench, is configured expressly to block movement of the connector through the wrench, i.e., prevent the "sleeve" from slipping off the connector. Pet. 45, Ex. 1007, col. 4, ll. 53–59, Fig. 6. Accordingly, because it was desirable to include a strengthening rib structure inside a "sleeve" and because it was known that a flange could be configured to prevent the "sleeve" from slipping off the connector, as taught by Smith, including a "retaining member" in a sleeve, such as that of Burris '509, is no more than the arrangement of old elements, each performing the function it was known to perform and yielding what one would expect from that arrangement. *See KSR*, 550 U.S. 398 at 417.

Notably, Patent Owner does not argue that including a flange or rib configured to retain the electrical connector in Burris '509 was outside of the ordinary skill in the art. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Indeed, Mr. Elliot testified that it could be done, but it would be "difficult" to design the rib's placement so the sleeve would work with other types of connectors. Ex. 1018, 67:3–68:7. Such universality, however, is not a claim requirement.

Instead, Patent Owner argues that placing the rib inside the tubular grip as a retaining member is a product of hindsight. PO Resp. 24. First, this argument narrowly focuses on the stated purpose of the rib in Burris '509, and does not take into account that "any need or problem

known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *KSR*, 550 U.S. at 420. Second, the argument that a modification would result in friction that would make it difficult to couple the connector to its port is unpersuasive. See PO Resp. 27–28. This argument focuses on the physical combinability of a flange into the tubular grip element of Burris ’509, not on whether the teachings of the prior art as a whole render the claims obvious. *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc); see also *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (stating “[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”). Further, “it is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.” *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983); *In re Andersen*, 391 F.2d 953, 958 (CCPA 1968)); see also *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) (“Combining the *teachings* of references does not involve an ability to combine their specific structures.”). Even if we were to focus on the combinability of these references, we find no factual support for the argument that the flange in Smith’s wrench would cause a frictional force or that the rib in Burris ’509, if configured to retain the sleeve, would make turning of the sleeve difficult. The testimony of Mr. Elliot on this point states no facts supporting his opinions of frictional forces deterring a person of ordinary skill in the art from the combination. See Ex. 2003 ¶ 24; see Office Patent Trial Practice Guide, 77 Fed. Reg. at 48,763 (“Affidavits expressing an opinion of an expert must disclose the underlying facts or data

upon which the opinion is based.”). No diagrams or schematics showing the alleged lack of clearance creating the frictional forces are provided, nor are any dimensions of the Burris ’509 connector provided to support Mr. Elliot’s conclusions and Patent Owner’s arguments. Consequently, we are not persuaded by these arguments.

Moreover, Patent Owner alleges that a person of ordinary skill in the art would not be motivated to modify Burris ’509 because the tubular grip is press-fit onto the nut, thus, already exhibiting the retaining function, i.e., adding a retaining member would render superfluous the press-fit engagement. PO Resp. 25. Patent Owner admits, however, that press-fit engagement and a flange are different retention techniques. PO Resp. 26. Because these are different techniques, persons of ordinary skill in the art could be motivated to avail themselves of both, especially given the choking hazards appreciated at the time of the invention. Pet. Reply 9. Besides, the press-fit engagement in Burris ’509 is applied to tightly attach the sleeve to the nut for tightening the nut. Ex. 1005, col. 7, ll. 4–8, 28–39. In contrast, a flange or rib does not provide a benefit directed at engaging the nut for tightening. Therefore, including a flange or rib to prevent the sleeve from coming off the connector is not redundant of the press-fit engagement benefits. Thus, we are persuaded that a person of ordinary skill in the art would appreciate the benefits of and the differences between the flange/rib and the press-fit engagement, and would not be deterred from applying both.

3. Secondary Considerations of Non-Obviousness

We now turn to analyzing evidence of commercial success offered by Patent Owner as secondary indicia of non-obviousness. Patent Owner offers

the Declaration of Mr. Zachary Raley as evidence of commercial success of the claimed invention. PO Resp. 30 (citing Exhibit 2004). According to Patent Owner, the evidence shows that when “gripping sleeves” called “QuickTorque” were incorporated into coaxial connector products, the “sales of those products with the sleeve far exceeded the sales of the products without the sleeve.” PO Resp. 31. As for nexus, Patent Owner argues that the commercial success “was and is directly caused by the introduction of the gripping sleeve into the connector products and the customers['] continued demand for products with the sleeve.” *Id.*

Petitioner argues four reasons against Patent Owner’s contention of commercial success. Pet. Reply 11. We have considered these reasons, and, in particular, note that there is some evidence that sales of connectors with sleeves were much lower than sales of sleeveless connectors. Pet. Reply 13 (citing Deposition Transcript of Mr. Zachary Raley, Ex. 1020, 130:9–138:14). Nevertheless, as for nexus, Petitioner argues that Patent Owner made no showing of demand of the connectors with the gripping sleeves based on the inventive features alleged by Patent Owner. Pet. Reply 14; Tr. 28:9–25. We agree that Patent Owner failed to show sufficient evidence of nexus.

As stated above, we have found that the difference between the prior art and the claimed subject matter centered on the “retaining member.” The alleged demand for the products with a “gripping sleeve,” however, stems from the benefit of allowing consumers to properly tighten their connectors and prevent loss of signal quality. Pet. Reply 14 (citing PO Resp. 33 and Declaration of Zachary Raley, Ex. 2004 ¶ 8). The marketing material submitted in support of Mr. Raley’s testimony confirms that the advertised

feature of the QuickTorque product is to achieve the properly tightened connector. Ex. 2004, Appendix A. That material, although mentioning in passing that the QuickTorque is a “permanent device,” is silent as to any of the recited retaining features. From the statement of “permanence,” we can infer that the device offers a convenience of having available the tightening grip of the sleeve without need for additional tools. *Id.* (stating that the “permanent device . . . enable[s] installers and homeowners to . . . tighten[] without the need for additional tools.”). That statement, however, does not demonstrate the QuickTorque’s benefit of preventing axial movement of the connector with respect to the sleeve, in accordance with the configuration recited in claim 1. Nor are we persuaded by the cursory statement of QuickTorque’s permanence that the advertisement refers to the benefit of the inner bore of the sleeve configured to retain the electrical connector in the inner bore, in accordance with the configuration recited in claim 11. Finally, we find that the advertising material touts an unclaimed feature of “innovative internal weather seal.” *Id.*

The only presented evidence of a demand for the product centers on the ability to properly tighten the connector with a sleeve, regardless of whether that sleeve includes a “retaining member” or the properly configured “inner bore” of that sleeve. *See e.g.*, Ex. 2004 ¶ 8, Appendix A. It was known in the prior art, however, to use a sleeve for tightening the electrical connector, as described in Burris ’509. Because the alleged commercial success is due to an element in the prior art, no nexus exists. *Ormco Corp.*, 463 F.3d at 1312. The evidence proffered by Patent Owner fails to show by a preponderance of the evidence the nexus between the

alleged commercial success and the merits of the electrical connector with the “retaining member” and “inner bore” configured as recited.

4. Conclusion Regarding Unpatentability of Claims 1 and 10 as Obvious

In analyzing the obviousness contentions with respect to claims 1 and 10, we have applied the *Graham* factors and our guiding legal principles. Balancing the evidence of obviousness against the objective evidence of non-obviousness, we are persuaded that Patent Owner’s evidence of commercial success is insufficient to overcome the weight of the evidence supporting obviousness of the claimed subject matter. Therefore, based on the evidence of record and the arguments presented, we conclude that Petitioner has shown, by a preponderance of the evidence, that claims 1 and 10 are unpatentable as obvious over the combinations of Burris ’509 and Smith or Burris ’509 and the knowledge of a person of ordinary skill in the art.

Patent Owner did not challenge Petitioner’s assertion of unpatentability with regard to the additional limitations found in dependent claims 2–9, 11–13, and 16–18. *See* PO Resp. 28–30 (referring only to claims 2, 6, 9, and 11–13 and failing to address claims 3–5, 7, 8, and 16–18). Having reviewed Petitioner’s evidence of unpatentability for those dependent claims, we conclude that Petitioner also has proven by a preponderance of the evidence that claims 2–9, 11–13, and 16–18 are unpatentable over Burris ’509 and the knowledge of a person of ordinary skill in the art or Smith.

F. PATENT OWNER’S ALLEGATIONS CONCERNING THE CREDIBILITY OF
DR. DICKENS

Patent Owner challenges the credibility of Dr. Dickens because Dr. Dickens allegedly failed to appreciate distinctions of the ’094 patent relevant to this case. PO Resp. 6–13. We are capable of discerning from the testimony, and the evidence presented, whether the witness’ testimony should be entitled to any weight, either as a whole or with regard to specific issues. In this case, however, most of the testimony that is alleged to reveal lack of credibility relies on whether Dr. Dickens appreciated Patent Owner’s emphasis on the word “assembly” recited in the preamble in the claims. *Id.* Therefore, to the extent the challenges to Dr. Dickens are based on the “assembly” contentions that Patent Owner has abandoned, we consider those challenges moot.

III. CONCLUSION

Petitioner has demonstrated, by a preponderance of the evidence, that:

- (1) claims 1, 3–5, 7, 8, 10, and 16–18 are unpatentable as anticipated by Smith under 35 U.S.C. § 102(b); and
- (2) claims 1–13 and 16–18 are unpatentable as rendered obvious over Burris ’509 and the knowledge of a person of ordinary skill in the art or Smith under 35 U.S.C. § 103(a).

This is a final written decision of the Board under 35 U.S.C. § 318(a). Parties to the proceeding seeking judicial review of this decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IV. ORDER

Accordingly, it is hereby:

ORDERED that, as set forth in Section III above, claims 1–13 and 16–18 of the '094 patent have been shown to be *unpatentable*.

FURTHER ORDERED that parties to the proceeding seeking judicial review of this Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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