

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TANDUS FLOORING, INC.,
Petitioner,

v.

INTERFACE, INC.,
Patent Owner.

Case IPR2013-00333
Patent 8,381,473 B2

Before BRIAN J. McNAMARA, TRENTON A. WARD, 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

Tandus Flooring, Inc. (“Petitioner”) filed a Petition to institute an *inter partes* review of all the claims, claims 1–58 (the “challenged claims”), of U.S. Patent No. 8,381,473 (“the ’473 patent”). We granted the Petition and instituted trial for all asserted claims. Paper 16 (“Dec. on Inst.”). Although Petitioner proposed a multitude of grounds of unpatentability based on thirteen references, we instituted trial of all challenged claims based on grounds supported by the following eight references: Pacione,¹ Kinoshita,² Murphy,³ Narum,⁴ Robinson,⁵ Pears,⁶ Owen,⁷ and Matthews.⁸

During trial, Interface, Inc. (“Patent Owner”) filed a Patent Owner Response, addressing the asserted anticipation and obviousness grounds. Paper 39 (“PO Resp.”). Patent Owner also filed a Motion to Cancel Claims and Contingent Motion to Amend. Paper 41 (“Mot. to Amend”). In that Motion Patent Owner requests cancellation of claims 1–5, 16–19, and 40–42, and, contingent on claims 20 and 22 being found unpatentable, proposes substitute claims 59 and 60. *Id.*

Petitioner replied to Patent Owner’s Response (Paper 49, “Pet. Reply”), and responded to the Motion to Amend (Paper 51, “Opp. to Mot. to Amend”). Both

¹ U.S. Patent No. 6,298,624 B1 (Ex. 1004) (“Pacione”).

² Japanese Application No. H5-163825 (Ex. 1006) (“Kinoshita”).

³ U.S. Patent No. 6,253,526 B1 (Ex. 1013) (“Murphy”).

⁴ U.S. Patent No. 6,866,928 B2 (Ex. 1009) (“Narum”).

⁵ U.S. Patent No. 3,241,662 (Ex. 1011) (“Robinson”).

⁶ U.S. Patent No. 3,819,773 (Ex. 1012) (“Pears”).

⁷ PCT App. WO 86/01247 (Ex. 1015) (“Owen”).

⁸ PCT App. WO 99/55792 (Ex. 1016) (“Matthews”).

parties requested an oral hearing, which was held on September 2, 2014. The transcript of that hearing is part of the record. Paper 66 (“Tr.”).

For the reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 6–15, 20–39, and 43–58 of the ’473 patent are unpatentable. Furthermore, Patent Owner’s request in its motion to amend to cancel claims 1–5, 16–19, and 40–42 is granted, and the entry of substitute claims 59 and 60 is denied.

A. THE ’473 PATENT (EXHIBIT 1001)

The ’473 patent generally relates to systems and methods for installing floor coverings, particularly carpet tile and other modular floor coverings. Ex. 1001, col. 1, ll. 24–26. The patent describes known methods for installation of conventional carpet tiles by gluing them to the floor, such as a layer of adhesive applied to the flooring surface and pre-applying adhesive or double-sided tape to the tile. *Id.* at col. 2, ll. 11–43. The patent describes that these methods posed problems because the adhesive would have to be removed from the floor, if installing new tiles, and that repositioning a tile is difficult. *Id.* at col. 2, ll. 23–31, 46–48. Further, the patent describes that using inelastic double-sided adhesive tape, with low tensile strength, may result in gaps between adjacent tiles. *Id.* at col. 2, ll. 48–51.

The ’473 patent describes using connectors to install floor tiles, where each connector includes an adhesive layer that contacts the underside of adjacent tiles and connects the tiles together to form the floor covering. *Id.* at col. 5, ll. 1–4. The patent illustrates the tile installation using said connectors as shown in Figure 5, reproduced below with annotations.

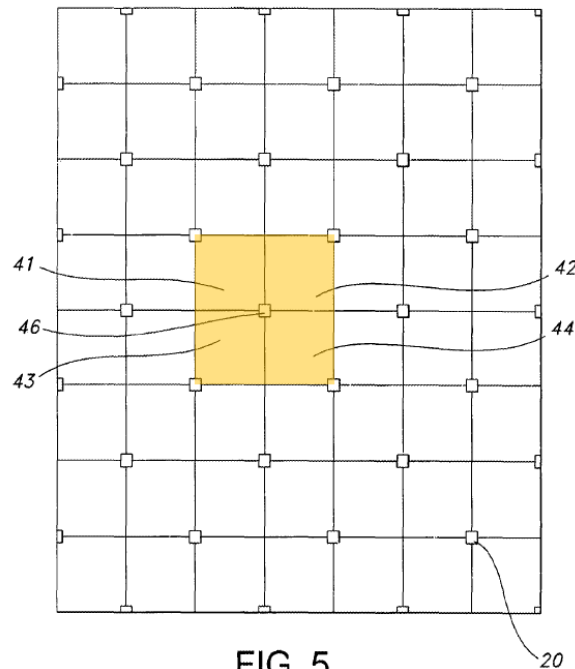


FIG. 5

Figure 5, above, is annotated in orange to illustrate a unit of four tiles in the embodiment of a conventional installation in which central connector 46 connects the four tiles at the intersecting corners. *Id.* at col. 8, ll. 61–66. “[T]he tiles are assembled on a[n] underlying flooring surface without the need to attach them to the floor surface, so that the tiles create a floor covering that ‘floats’ on the underlying floor surface.” *Id.* at col. 5, ll. 5–8. To facilitate rapid floor installation, the patent describes that the connector includes a film that is stiff, typically with greater stiffness than most adhesive tapes that curl or droop down from the underside of a tile. *Id.* at col. 5, ll. 9–11, 16–20.

The patent also describes that the connector’s film exhibits a “relatively high tensile strength to resist stretching under foot traffic and rolling loads.” *Id.* at col. 5, ll. 25–27. The connector’s adhesive should adhere to the tile, but should not be so strong “as to prevent removal and repositioning of the tile relative to the connector.” *Id.* at col. 6, ll. 21–24. Further, the patent contemplates adhesives

exhibiting “sufficient shear strength to prevent the tiles from moving relative to the connectors or each other and thereby creating gaps between adjacent tiles after installation.” *Id.* at col. 7, ll. 6–9.

B. ILLUSTRATIVE CLAIM

Challenged claims 6, 20, and 43 of the '473 patent are the only independent claims at issue. Claim 20 reproduced below, is illustrative of the claimed subject matter:

20. An installation of modular carpet tiles connected together with connectors, each connector comprising:

- a. a sheet having two sides; and
- b. a layer of adhesive located on one side of the sheet, wherein the layer of adhesive is capable of forming a bond between the sheet and the undersides of the tiles and comprises a sufficient shear strength so that, when a connector spans adjacent edges of adjacent tiles so that the layer of adhesive contacts the undersides of the adjacent tiles, the connector prevents adjacent tiles from moving relative to the connector or each other and thereby creating gaps between the adjacent tiles after installation; and

wherein the sheet comprises material sufficiently stiff for a connector positioned partly in contact with an underside of a tile to project beyond the edge of the tile in roughly the same plane as the underside of the tile.

II. ANALYSIS

A. CLAIM CONSTRUCTION

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). 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 ’473 patent, and in particular, the following:

Claim Language	Interpretation
“relative movement”	movement in relation to the adjacent tiles
“sufficient shear strength”	adequate capacity to resist shear

Dec. on Inst. 10–15.

Patent Owner challenges our construction of the “sufficient shear strength” limitation and raises a new issue of claim construction regarding the recited “connectors.” PO Resp. 10–13. We analyze each of these issues in turn.

1. “*sufficient shear strength*” limitation (Claims 6, 20, and 43)

The claims recite that “the layer of adhesive . . . comprises a sufficient shear strength so that . . . the connector prevents adjacent tiles from moving relative to the connector or each other” Claims 6, 20, and 43. Patent Owner argues that “sufficient shear strength” relates only to the ability of the adhesive to prevent lateral movement. PO Resp. 12. We concluded in our Decision on Institution that by reciting “sufficient shear strength,” the claims are not limited to preventing only *lateral* movement and *lateral* gaps. Dec. on Inst. 12. Patent Owner proffers witness testimony in support of the argument that “shear strength” relates to preventing lateral movement, while “peel strength” relates to lifting, i.e., vertical

movement. PO Resp. 12 (citing Ex. 2014 ¶¶ 80–90; Ex. 2017 ¶¶ 80–92; Ex. 2012, generally). Patent Owner also states that the word “gap” is a “term of art” in the carpet tile industry, and that recitation of “gap” refers, thus, to lateral separation between the edges of the tiles. *Id.* at 13 (citing Ex. 2014 ¶¶ 54, 89; Ex. 2017 ¶¶ 53, 91).

We are not persuaded by Patent Owner’s arguments because the claim language and specification of the ’473 patent do not support the proffered contention that the claims are limited to preventing only *lateral* movement. The claim language is paramount to our analysis. The claim recites, first, “shear strength” distinctly from, second, “prevent[ing] . . . moving *relative to the connector* or each other (emphasis added).” Although these two features are functionally related, in the context of the claim the first feature cannot redefine or rewrite the second feature. That is, even if the customary understanding of “shear strength” focused solely on a plane parallel to the flooring surface, i.e. strength in the horizontal or lateral direction, the claim expressly recites preventing *relative* movement, which is broader than *lateral* movement.

Not only does the claim language foreclose narrowing the claims as Patent Owner argues, but the specification gives no indication that the ordinary and customary meaning of an adhesive layer with sufficient “shear strength” would only prevent lateral movement or lateral gaps. To be clear, the specification does not define “shear strength.” Similarly, the specification is silent regarding a definition for “creating gaps,” such that a “gap” could be interpreted clearly as meaning only a *lateral* gap. Neither does Patent Owner argue that any definition for these terms is provided expressly in the specification. Instead, we are confronted with the arguments that: (1) “[a]ll of the experts agree” on the “shear

strength” limitation preventing lateral movement; and (2) the word “gap” is a “term of art” referring to lateral separation between tile edges. PO Resp. 11–13.

Regarding the term “shear strength,” Patent Owner does not show that our construction of “shear strength”—“adequate capacity to resist shear”—is in error. Patent Owner’s argument focuses on whether the adequate capacity to resist shear concerns only the prevention of lateral movement. *Id.* In support of that argument, Patent Owner relies on extrinsic evidence in the form of witness testimony regarding whether lateral movement, but not vertical movement, is understood by person of ordinary skill in the art. *See, e.g.,* Wood Decl., Ex. 2017 ¶¶ 81–92 (stating that it makes no sense to construe “shear strength” as preventing anything other than lateral movement because the industry knew how to keep tiles lying flat and that the patent only teaches prevention of lateral movement by referring to “gaps”); Endrenyi Decl., Ex. 2014 ¶¶ 81–90 (stating the same as Mr. Wood); Deposition of Dr. Tippett, Ex. 2012, 88:14–25 (testifying of development of shear strength test of a carpet tile to determine the force used to move a carpet laterally). But as stated above, the claim expressly recites the relative movement broadly, without limiting that movement to any direction.

Furthermore, the witness testimony is unpersuasive. In particular, we note the flaw in the argument that if the claim had meant to preclude vertical movement in addition to lateral movement, the claim language would reference the peel strength of the adhesive. *See, e.g.,* Ex. 2014 ¶ 87. The omission of peel strength in the claim language is not evidence that the claims would exclude preventing vertical movement, such as that caused by peeling off. Failing to restrict the recited movement of the tiles to lateral movement results in a broad claim that

encompasses both vertical and lateral movement, regardless of whether the strength of the adhesive is directed expressly to resist shear, or lateral forces.

With regard to the meaning of “gap,” all of the testimony relied on to support Patent Owner’s argument on this point is opinion evidence, without supporting facts or explanation of how the specification supports such an opinion. *See, e.g.*, PO Resp. 13; Endrenyi Decl., Ex. 2014 ¶ 53 (stating that “gapping” and “buckling” are “terms of art in the industry that refer to consequences of adjacent tiles moving laterally on the floor so that adjacent edges of tiles no longer abut”); Wood Decl., Ex. 2017 ¶ 53 (“[g]apping’ is an industry term that refers to lateral separation of adjacent tile edges”); *but see* Deposition of Dr. Tippett, Ex. 2012, 76:12–77:15 (referring, during Dr. Tippett’s cross-examination, to horizontal gaps and vertical gaps known at the time of the invention, 2004). The testimony relied on by Patent Owner to support its argument is unpersuasive. First, the specification neither refers to “gapping” nor states (or implies that) the word “gap” is directed solely to tiles moving laterally relative to the connector or another tile. Indeed, the specification uses the word “gap” generally. Two of those uses appear in the Background of the Invention describing problems with tape of low tensile strength and inelasticity. *See* Ex. 1001, col. 2, ll. 48–51, col. 3, ll. 15–21. A third use, also in the Background of the Invention, describes problems with indirect attachment methods where “tiles are more likely to move relative to each other and thereby create gaps in the installation.” *Id.* at col. 3, ll. 1–4. This statement is particularly enlightening because in comparison with other statements referring to gaps formed between adjacent tiles, this statement refers to gaps more generally, i.e. “gaps in the installation.” The fourth use of the word “gap” repeats *verbatim* the claim language concerning “shear strength,” and, therefore, provides no further

insight as to the use of the word. *See id.* at col. 7, ll. 6–9. Review of these broad statements in the specification reveals that there is no express intent of using “gap” in the sense of meaning *only a lateral gap*.

Furthermore, other than the conclusory assertions of Patent Owner’s Declarants, Messrs. Wood and Endrenyi, there is insufficient factual support for the assertion that the word “gap,” commonly understood to mean an opening or a space,⁹ was, at the time of the invention, a “term of art” in the carpet tile industry referring solely to *lateral* separation between tiles. Indeed, a named inventor of the ’473 patent, Mr. Keith Gray, has averred that: “[t]he word ‘gap’ is not a term of art in the carpet tile industry. End users, installers, dealers, and others use the word as a general description of a problem with adjacent tiles coming apart in any direction.” Ex. 1044 ¶ 22.¹⁰

On the whole, we are not persuaded that the ordinary and customary meaning, under the broadest reasonable interpretation, of the “shear strength” limitation is limited to *lateral* movement or *lateral* gaps, because there is insufficient evidence that such a narrow interpretation is appropriate. *See E-Pass*

⁹ Ex. 1027 (Definition *gap* (n)(4), *Webster’s Ninth New Collegiate Dictionary*, 1986 (“a separation in space”); Definition *gap* (n)(1), *Webster’s II New College Dictionary*, 1996 (“an opening as in a wall”)).

¹⁰ *See* Ex. 2052, 102:3–104:19. We note Patent Owner contends that Mr. Gray’s testimony is biased and contradictory. Paper 57, PO Mot. for Observations 2, 7. We also note that Petitioner responded to these contentions by showing testimony regarding the level of knowledge of Mr. Gray and that the testimony is consistent with Petitioner’s allegations that the word “gap” includes lateral separation, but does not exclude vertical separation. Paper 63, Pet. Resp. to PO Mot. for Observations 1–2, 9–10. We have taken Patent Owner’s contentions and Petitioner’s response into consideration when determining the weight accorded to Mr. Gray’s testimony.

Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1368 (Fed. Cir. 2003) (Where no explicit definition for the term “electronic multi-function card” was given in the specification, this term should be given its ordinary meaning and broadest reasonable interpretation; the term should not be limited to the industry standard definition of credit card where there is no suggestion that this definition applies to the electronic multi-function card as claimed, and should not be limited to preferred embodiments in the specification.).

Turning to the disputed claim language, as we stated in our Decision on Institution, we determine that the word “sufficient” introduces a relative amount to the recited “shear strength.” The phrase “shear strength” is the capacity of a material to resist shear.¹¹ And “shear” is “a strain resulting from applied forces that cause or tend to cause contiguous parts of a body to slide relatively to each other in a direction parallel to their plane of contact.”¹² Applying the plain and ordinary meaning to the claim language, therefore, the layer of adhesive must have the adequate capacity *to resist* shear. The layer’s capacity, however, does not narrow the claimed function of including such a layer in the connector *to prevent only* lateral movement of adjacent tiles and lateral gaps from forming after installation. The plain language of the claims confirms this interpretation because the result of providing the “sufficient shear strength” at the adhesive layer is to

¹¹ *Definition shear strength*, WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY, UNABRIDGED (1993), available at <http://lionreference.chadwyck.com> (Dictionaries/Webster’s Dictionary) (Exhibit 3001).

¹² *Definition shear*, WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY, UNABRIDGED (1993), available at <http://lionreference.chadwyck.com> (Dictionaries/Webster’s Dictionary) (Exhibit 3002).

prevent adjacent tiles from moving relative to the connector *or each other*. This claim language indicates that abutting tile edges are prevented from moving “in a direction parallel” to the plane of contact—which would include both lateral and vertical movement. For example, lifting may be prevented when providing a resistance to shear sufficient to allow for the horizontal strain caused by suction, traffic, and any other dragging force.

Accordingly, we construe “sufficient shear strength” to mean “adequate capacity to resist shear.”

2. “connector”

Patent Owner contends that the recited “connector” is smaller than the carpet tiles that it connects. PO Resp. 10–11. In support of this contention, Patent Owner points out that every depiction of the “connector” in the figures is consistent with this position. *Id.* at 10. We address each of Patent Owner’s arguments in turn.

First, independent claims 6, 20, and 43 recite the connector without restricting its surface area or size in any way. At best, the claim recites that the connectors are positioned to span adjacent edges of at least two tiles and “extend along only a portion of the adjacent edges.” This claim language does not suggest that the connector’s surface area must be smaller than that of the tile. Indeed, a connector, same surface area as or larger than the tile, may meet this limitation so long as “at least one of the connectors” is positioned in the manner claimed. Moreover, the ’473 patent includes claims depending from the above-referenced independent claims, specifically addressing the surface area limitations of a connector that is smaller than the tile. *See, e.g.*, claims 22–23. Patent Owner does not explain why the size of the “connectors” should be a limitation under the ordinary and customary meaning of the claim, especially in light of dependent

claims expressly reciting size limitations.

Furthermore, we are not persuaded that the depiction of the connectors in the figures weighs in favor of limiting the claim term thusly. Although the figures show a connector square that is smaller than the tile squares (Ex. 1001, Figs. 5–8), those figures show embodiments of possible installations. *Id.* at col. 8, l. 61–col. 9, l. 17. And although the depictions are instructive, we generally do not import into the claims limitations of shown embodiments. Of note is the description of various shapes of the connector: rectangular and triangular shapes. *See id.* at col. 9, ll. 25–28. It would be no more proper to limit the size of the connector, to be smaller than the tile, than it would be to limit the claims to a rectangle or square, simply because that is what appears to be depicted in the patent figures.

Accordingly, we decline to include a size limitation in the plain and ordinary meaning of “connector.”

B. RELEVANT LEGAL PRINCIPLES

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 Pharms.*, 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

Because our decision reaches at least one ground of unpatentability based on obviousness, we first determine the level of ordinary skill in the art in accordance with *Graham*.

Petitioner has not stated the level of ordinary skill in the art for this case. On the other hand, Patent Owner challenges the testimony of Petitioner’s witnesses because Patent Owner contends that a person of ordinary skill in the art is a person having knowledge of carpet tiles and how to install them, not a person who is an expert in adhesive tape. PO Resp. 16.

To determine the level of ordinary skill in the art in this case we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, and the sophistication of the technology. *Custom Accessories v. Jeffrey-Allan Indus. Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986). Also, we are guided by the level of ordinary skill in the art reflected by the prior art of record. *Okajima*, 261 F.3d. at 1355 (the prior art itself can reflect the appropriate level of skill in the art).

We are persuaded that the level or ordinary skill in the art combines the knowledge of carpet tile installation and adhesive tape characteristics. The prior art of record, particularly Kinoshita, describes the solution of laying carpet tiles

using adhesive tape pieces to avoid laying adhesive on the floor. Ex. 1006 ¶¶ 1–2, 5. Pacione also describes installation of carpet modules without substantial attachment to the floor. Ex. 1004, Abstract. Therefore, we agree with Patent Owner that the level of ordinary skill in the art includes knowledge of carpet tiles and their installation methods.

We disagree with Patent Owner, however, in that the level of ordinary skill in the art would not include expertise in adhesive tape characteristics. *See* PO Resp. 18 (arguing that Dr. Jensen is not a POSITA because his expertise relates to pressure sensitive adhesive tapes). For instance, Kinoshita discloses the use of removable, single-side or double-sided adhesive tape that is pressed to the rear of the carpet tiles. Ex. 1006 ¶¶ 7–8, 12. Kinoshita recognizes that the adhesive must be of sufficient strength to stick to the rear of the carpet tile, but also allow for repositioning. *Id.* ¶ 12. Details of the backing for pressure sensitive adhesive tape are part of the prior art of record, such as Robinson (Ex. 1011). For example, Robinson describes the properties and characteristics to make the adhesive tape backing suitable for pressure-sensitive adhesive tapes. *Id.* at col. 1, l. 46–col. 2, l. 44. Therefore, it is appropriate that we consider, as part of the level of ordinary skill in the art, knowledge of adhesive tape appropriate for carpet tile installations as described in Kinoshita, as well as the knowledge of the properties and characteristics of pressure-sensitive tapes suitable for the use in carpet tile installations.

Patent Owner's arguments that Petitioner's experts are not competent to testify because they are not persons of ordinary skill in the art are unpersuasive. *See* PO Resp. 16–20 (arguing the competency of Dr. Jensen and Dr. Tippet based on the level of ordinary skill in the art). A declarant may be qualified as an expert

if the declarant's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue. Fed. R. Evid. 702. Patent Owner has not filed a motion to exclude on the basis of competency of Petitioner's expert witnesses, and, therefore, we do not undertake an analysis of whether the challenged experts are, indeed, qualified under the Federal Rules of Evidence. Nevertheless, arguments that the scientific or technical experience and knowledge of Dr. Jensen and Dr. Tippett do not match the alleged level of ordinary skill in the art are unpersuasive as there is no requirement of a perfect match between the expert's experience and the field of the art in question. *See SEB S.A. v. Montgomery Ward & Co. Inc.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010). Dr. Tippett need not be an adhesive tape engineer to testify regarding glueless carpet tile installations, and Dr. Jensen need not be an expert in carpet tile installations to testify regarding adhesive tape engineering for carpet products. *See* Pet. Reply 4–5 (setting forth that Dr. Jensen has direct experience designing adhesive tapes for installation of carpet products and that Dr. Tippett has experience developing glueless carpet tile installation methods). Furthermore, we are capable of discerning from the testimony, and the evidence presented, whether the witness' testimony is entitled to any weight, and taking into consideration the areas of expertise of each witness in weighing that testimony accordingly.

With these considerations in mind, we now turn to determining the differences between the prior art and the claims-at-issue.

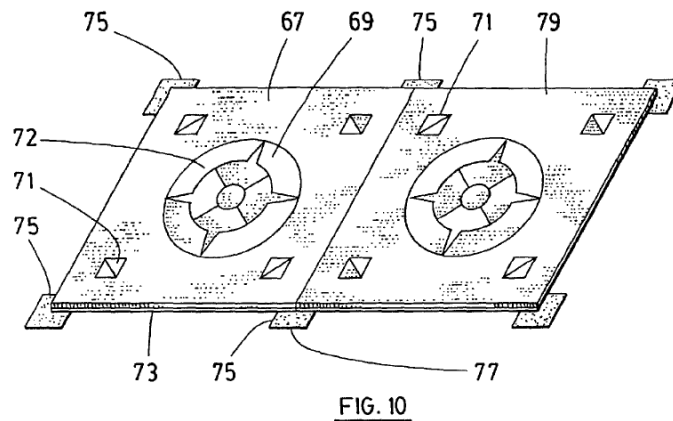
D. ANTICIPATION BY PACIONE

With respect to the asserted ground of unpatentability based on anticipation by Pacione, 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 20, 29, 30, and 36–39 are anticipated by Pacione.

1. Overview of Pacione (Ex. 1004)

Pacione discloses rigid anchor sheets for use under carpets or other decorative coverings. Ex. 1004, col. 1, ll. 11–13. Pacione describes an advantage of allowing the carpet or other decorative covering to be attached to an underlying undersurface at only a few discrete attachments points or, even in some cases, not attached at all, so as to be removable easily. *Id.* at col. 2, ll. 42–46. The Pacione anchor sheet is both flexible and rigid—the rigidity is such that the anchor sheet can support itself without droop, unlike cloth or fabric or tape. *Id.* at col. 3, ll. 56–62. To secure adjoining anchor sheets, Pacione uses “means for detachable attachment” disclosed as a hook and loop attachment or adhesive as an alternative. *Id.* at col. 4, ll. 48–55. One embodiment of Pacione, depicted in Figure 10, reproduced below, describes the use of anchor sheets with carpet pieces. *Id.* at col. 11, ll. 28–31.



Pacione describes abutting carpet pieces 67 and anchor sheets 73 that are attached to the floor by small pieces of hook tape 75 at the corners, overlapping with adjoining carpet pieces, as shown in Figure 10 above. *Id.* at col. 11, ll. 30–40.

In this embodiment, Pacione discloses an advantage of needing to attach anchor sheets 73 to each other only with tape 75 at a discrete corner. *Id.* at col. 11, ll. 63–68. “If a modular system is used[,] attachment points to the underlying floor may not be required.” *Id.* at col. 11, ll. 46–48.

With respect to another embodiment, shown in Figure 13 reproduced below, Pacione describes smaller anchor sheets 89 that can be used with carpet tiles 91. *Id.* at col. 14, ll. 24–31.

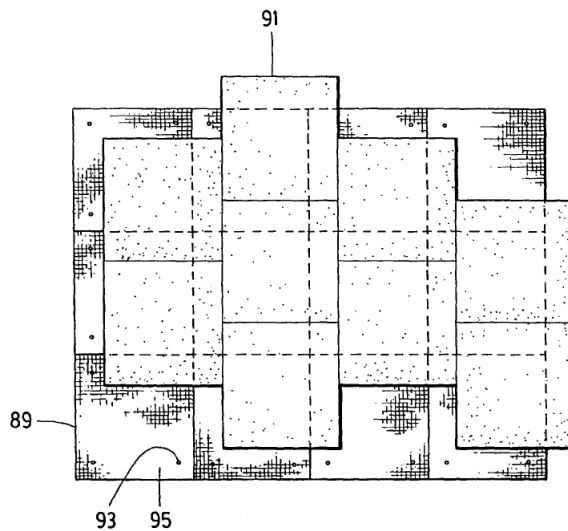


FIG. 13

Figure 13 depicts the overlapping layout of carpet tiles 91 on anchor sheets 89 forming a contiguous mass that is “sufficient to provide for stable installation without attachment to a floor.” *Id.*

2. Comparison of Pacione and Claims 20, 29, 30, and 36–39

Independent claim 20 recites a connector comprising a sheet and a layer of adhesive on one side of the sheet. Ex. 1001, claim 20. More particularly, the layer of adhesive is required to form a bond and comprises a sufficient shear strength, as recited. *Id.* With regard to the sheet of the connector, claim 20 requires that the

sheet comprises material sufficiently stiff. *Id.*

Chart I of the Petition identifies the disclosure in Pacione that discloses each of these limitations:

- a) anchor sheets 89 that are secured to carpet pieces 91 with hook and loop attachment shown in Figure 13 (the claimed “connector comprising: (a) a sheet having two sides” and “a connector [that] spans adjacent edges of adjacent tiles”) (Pet. 37);
- b) a hook and loop attachment system that could also be an adhesive (the claimed “layer of adhesive”) (*id.*);
- c) anchor sheets that have sufficient rigidity and horizontal plane stability (the claimed “sufficient shear strength”) (*id.*); and
- d) anchor sheets with relative rigidity so they do not droop (the claimed “sheet comprises material sufficiently stiff . . .”) (*id.*).

With regard to dependent claims 29, 30, and 36–39, the Petition identifies that Pacione discloses using a releasable adhesive that maintains tackiness (commensurate with claims 29 and 30) and a polyester, plastic anchor sheet of 0.010 to 0.030 inches (commensurate with claims 36–39). Pet. 38–39 (citing Ex. 1004, col. 4, ll. 51–55, col. 9, ll. 49–51).

Patent Owner challenges the applicability of Pacione to the claims based on three arguments: (1) Pacione is not directed to carpet tile installations (PO Resp. 25–26); (2) Pacione does not disclose a “connector” (*id.* at 26–27); and (3) Pacione does not disclose the “sufficient shear strength” limitation (*id.* at 27–28). *See id.* at 35–36. We address each of Patent Owner’s arguments in turn.

a. Carpet Tile Installations

Patent Owner attempts to distinguish the Pacione carpet pieces on the basis

that these pieces do not have the structural backing of “carpet tiles.” *Id.* at 25. Accordingly, Patent Owner proffers that a person of ordinary skill in the art would not look to Pacione for guidance or useful information regarding carpet tiles. *Id.* at 25–26. We are not persuaded by this argument. The body of the claims does not recite any particular characteristic of a “carpet tile,” a term that appears only in the preamble and which neither party argues is a claim limitation. Notwithstanding the absence of this term in the body of the claims, we are guided by the specification in reaching the conclusion that a “carpet tile” is not limited to structurally backed carpet, as Patent Owner argues. The specification describes carpet “tiles” broadly, including that these are “modular floor covering units” and could be made of suitable modular materials. Ex. 1001, col. 4, ll. 41–58. We find no description in the specification limiting the use of the claimed “connectors” with modular floor covering units having a particular structural backing. Moreover, Pacione discloses that the decorative carpet pieces there disclosed may be “carpet tiles.” Ex. 1004, col. 14, ll. 25–31. Pacione further discloses that the pieces may be rigid, such as parquet flooring. *Id.* at col. 14, ll. 31–33. Finally, the testimony Patent Owner proffers for the proposition that the Pacione carpet tiles are not “carpet tiles,” in the sense of the ’473 patent, is insufficient for us to restrict the claims to an unrecited and unwarranted limitation of structural backing for carpet tiles.

b. Connectors in Pacione

Patent Owner takes issue with the comparison of the anchor sheets and the hook tape pieces in Pacione with the “connector” recited in claim 20. PO Resp. 26. The challenge is based on two arguments. First, the anchor sheets do not attach to the underside of the carpet tiles, and, second, they are as large as the carpet pieces. *Id.*

With regard to the argument regarding attachment to the carpet tile, claim 20 recites that the “layer of adhesive is capable of forming a bond between the sheet and the undersides of the tiles.” Ex. 1001, col. 11, ll. 55–56. The layer of adhesive in Pacione is a detachable hook and loop system or an adhesive between one side of the anchor sheet and the underside of the carpet. *See, e.g.*, Ex. 1004, Fig. 4 (showing loops 18 in the underside of carpet 15 for attaching to hooks), col. 9, ll. 15–21. Patent Owner does not argue explicitly why Pacione does not disclose the capability of forming a bond as recited. PO Resp. 26 (stating only that the anchor sheets do not attach to the underside of carpet tiles to connect carpet tiles to each other). We find that Pacione’s anchor sheets are capable of forming the bond “between the sheet and the undersides of the tiles” as Pacione’s anchor sheet is covered with hooks that engage loops located at the underside of the tile. Furthermore, the anchor sheets, as shown in Figure 13 of Pacione, form smaller modules laid out in an overlapping pattern that connects the contiguous carpet pieces 91 to each other. Ex. 1004, col. 14, ll. 24–30, Fig. 13. Accordingly, we find unpersuasive Patent Owner’s arguments that Pacione’s anchor sheets are not “connectors” because they do not attach to the underside of the carpet tiles to connect them.

We also find unpersuasive the argument that Pacione’s anchor sheets are too large to be “connectors.” This argument is based on Patent Owner’s proposed construction of “connector.” As discussed above in the claim construction section, we disagree with Patent Owner that the plain and ordinary meaning of the term includes a size limitation or constraint.

c. Sufficient Shear Strength Limitation

Patent Owner argues that the Pacione disclosure of adhesive is insufficient to teach the “sufficient shear strength” limitation. PO Resp. 27–28. According to Patent Owner, the disclosure in Pacione is no more than a suggestion to try adhesive and is not an enabling disclosure. *Id.* We agree with Patent Owner that the “sufficient shear strength” limitation is recited as a property of the layer of adhesive. *See id.* at 28 (Patent Owner arguing that the rigidity and stability are characteristics of Pacione’s anchor sheets, not the adhesive). Nevertheless, the “sufficient shear strength” property results in connector that prevents adjacent tiles from moving relative to the connector or each other and thereby creating gaps between the adjacent tiles after installation. That is, an adhesive would have the requisite shear strength when the connector accomplishes the prevention of the relative movement that creates gaps.

In Pacione, we find that the anchor sheets, the recited “connector,” are attached with a detachable attachment that could also be an adhesive. Ex 1004, col. 4, ll. 51–55. With Pacione’s anchor sheets using the disclosed detachable attachment (including the adhesive option) the installed anchor sheets form a contiguous floor covering having sufficient rigidity and horizontal plane stability or shear force stability. *Id.* at col. 4, ll. 15–20, col. 5, ll. 3–9. We find this disclosure particularly significant because it specifically attributes the shear force stability to the *installed* anchor sheets under the carpet pieces, i.e., the recited “connectors” with the layer of adhesive. It follows from this express disclosure of shear force stability that the *installed* carpet tiles are stable in the horizontal plane, such that their movement with respect to each other, and with respect to the anchor sheets, would be restricted. Patent Owner fails to point us to evidence that

Pacione's anchor sheets, under carpet tiles, exhibiting the disclosed shear force stability, do not prevent the recited relative movement that creates gaps as recited.

As for the argument that Pacione is not enabled with regard to the disclosure of using adhesive in place of hook and loop, we have not been directed to facts sufficient to show that such a disclosure would not inform one of ordinary skill in the art how to make the claimed connector. *See In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985) (“Such possession is effected if one of ordinary skill in the art could have combined the publication’s description of the invention with his [or her] own knowledge to make the claimed invention.”). It is undisputed that Pacione discloses replacement of the hooks with adhesive. Patent Owner makes the point, however, that Pacione does not disclose the characteristics of the adhesive. PO Resp. 27. The question for us to decide is whether Pacione’s disclosure of adhesive is sufficiently enabled to allow a person of ordinary skill in the art to make the claimed connector. The lack of details regarding adhesive properties, however, does not negate that Pacione discloses the adhesive application together with anchor sheets that achieve shear force stability when installed.

Furthermore, the testimony of Mr. Benny Wood, proffered by Patent Owner to support its contention, does not persuade us that disclosure of adhesive in Pacione is not enabling. *Id.* (citing Ex. 2017 ¶ 131). That testimony focuses on whether Pacione teaches an adhesive that would prevent lateral movement, a narrow view of the claims that we do not adopt per our claim construction discussion above. *See* Ex. 2017 ¶ 131. Furthermore, in his cross-examination, Mr. Wood did not dispel the notion that Pacione’s disclosure of adhesive would be sufficient, because his reasons for opining that the adhesive is not taught sufficiently are not relevant to the scope of the claim. For example, Mr. Wood

states that use of adhesive would cause the anchor sheet not to perform as well under commercial traffic and would need to be redesigned to remove the hooks and loops and bond the pieces together. *See* Ex. 1048, 181:21–186:21. The claims are not directed to installations for commercial traffic. And replacing the hook-and-loop mechanism with an adhesive having the properties of hook and loop, such as good horizontal strength, is taught expressly in Pacione. Ex. 1004, col. 16, ll. 46–50 (“A permanent adhesive can be used for a permanent bond between tile 114 and anchor sheet 112 or a temporary adhesive having the properties of hook and loop (i.e. [c]an be attached and reattached and good horizontal strength) can be used.”). In short, the record before us presents insufficient evidence to support Patent Owner’s contention that the disclosure in Pacione of using adhesives in place of hook and loop attachment is a mere suggestion and not enabling.

Finally, Patent Owner argues that the embodiment of Figure 10 of Pacione is not consistent with carpet tile installations. PO Resp. 28–34. These arguments, however, are not responsive to the asserted ground of unpatentability based on anticipation, which is directed to the embodiment illustrated in Figure 13 of Pacione. Patent Owner’s arguments are not persuasive to overcome the evidence presented by Petitioner that claims 20, 29, 30, and 36–39 are anticipated by Pacione.

Based on the foregoing, we determine that Petitioner has proven by a preponderance of the evidence that claims 20, 29, 30, and 36–39 are unpatentable as anticipated by Pacione.

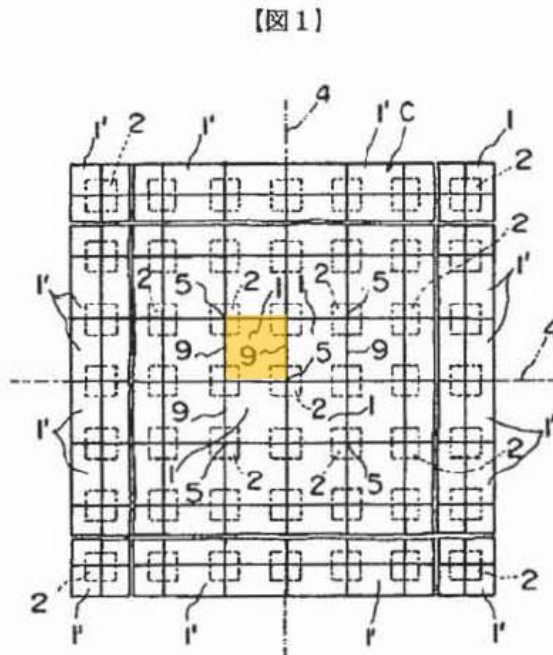
E. OBVIOUSNESS BASED ON COMBINATIONS OF REFERENCES

The remaining asserted grounds are based on obviousness over various combinations of prior art. We now turn to the analysis of the obviousness grounds

primarily based on Kinoshita in combination with Narum, Robinson, Owen, Matthews, Pears, and Pacione. The scope of Kinoshita, Narum, Robinson, Owen, Matthews, and Pears is described below by way of an overview.

1. Overview of Kinoshita (Ex. 1006)

Kinoshita is directed to a method for laying carpet tile. Ex. 1006, Abstract. The object of Kinoshita's method is to lay carpet tiles easily and without the use of floor adhesive. *Id.* The result is laid carpet tiles that do not rise up and peel off when using a vacuum cleaner, even if the carpet tile is lightweight. *Id.* Figure 1 of Kinoshita, reproduced below with annotations, illustrates the laid carpet tiles using the described installation method. *Id.* ¶ 9.



As shown in Figure 1, carpet tile units 1 (highlighted in orange) are laid out with pieces of adhesive tape 2 at the corners to constitute carpet C. *Id.* The square pieces of adhesive tape 2 are arranged on the floor facing up and adhere to carpet

tile units 1 to form an interlinking pattern. *Id.* ¶¶ 7, 10. The rear face of adhesive tape 2 is preferably an anti-slip material (or rubber). *Id.* ¶ 12.

2. *Overview of Narum (Ex. 1009)*

Narum is directed to a cleanly removable carpet tape that does not leave significant residue. Ex. 1009, col. 6, ll. 18–24. The tape can be single-sided or double-sided. *Id.* at col. 6, ll. 26–27. Narum describes the property of the tape as follows: skin adhesive of at least 0.012 mm (0.5 mil) thickness, and, typically, at least about 0.051 mm (2 mils); and 90 degree-peel adhesion less than 5.25 kN/m (30 lbs/in.), preferably less than about 3.5 kN/m (20 lbs/in.), and, more preferably, less than about 1.75 kN/m (10 lbs/in.). *Id.* at col. 17, ll. 41–51. Narum further describes pressure-sensitive adhesives as desirable. *Id.* at col. 17, ll. 51–54. Such adhesives may be based on acrylic adhesives. *Id.*

3. *Overview of Robinson (Ex. 1011)*

Robinson describes a pressure-sensitive adhesive tape with a biaxially oriented polypropylene backing. Ex. 1011, col. 1, ll. 10–14. Robinson describes the properties of biaxially oriented propylene as desirable in a pressure-sensitive adhesive tape, including age resistance, moisture resistance, tear strength, elongation, tensile strength, solvent resistance, flexibility, heat stability, modulus of five percent elongation, and economics. *Id.* at col. 1, l. 45–col. 2, l. 44. Used as a backing for pressure-sensitive tape, the biaxially oriented polypropylene film varies in thickness from 0.5 to 3.0 mils, preferably from about 0.73 to 2.0 mils. *Id.* at col. 2, ll. 45–49.

4. *Overview of Owen (Ex. 1015)*

Owen describes a method of installing a floor covering. Ex. 1015, 1, ll. 1-4. The surface of carpet tiles comprises a textile material that releasably engages with

fibrous projections on another material. *Id.* at 2, ll. 27–41. When the tiles are square or rectangular, the fibrous-projection-based material may be disposed beneath four adjacent corners of the tiles. *Id.* at 4, ll. 1–4, Fig. 3. Owen describes, however, that it is not necessary for every tile to be secured with the material. *Id.* at 3, ll. 18–21.

5. *Overview of Matthews (Ex. 1016)*

Matthews describes seam tape for use in carpet seams. Ex. 1016, 1, l. 10. One embodiment of Matthews describes the dimension of the base sheet of a tape having a width of approximately 2.5 to 7 inches. *Id.* at 7, ll. 2–3.

6. *Overview of Pears (Ex. 1012)*

Pears is directed to manufacturing synthetic-linear-polyester films, such as a biaxially oriented synthetic-linear-polyester film. Ex. 1012, col. 1, ll. 36–40. The film exhibits the following property: breaking strength of 24,850 lb./in.² in the machine direction of the film and 28,050 lb./in.² in the transverse direction of the film. *Id.* at col. 4, ll. 10–27.

7. *Comparison of Independent Claims 6, 20, and 43 With Regard to the Grounds Based on Kinoshita in Combination with Other References*

Petitioner asserts that Kinoshita teaches: (a) adhesive tape pieces 2, unattached to the floor and with the adhesive side facing up for linking carpet unit tiles (the claimed “connector,” “film” or “sheet,” and “layer of adhesive”) (Pet. 44–45, 56–57); and (b) adhesive tape pieces 2 that are installed on lightweight-carpet-tile units to prevent the units from rising up and peeling off (the claimed “sufficient shear strength” and “prevents adjacent tiles from moving relative to the connector or each other and thereby creating gaps between the adjacent tiles after installation”) (Pet. 45, 51–52, 56–57).

Patent Owner challenges Petitioner's assertion that Kinoshita teaches the claimed "connector," because Kinoshita lacks description of the adhesive tape properties or performance, and, therefore, the adhesive of the Kinoshita tape cannot be said to have "sufficient shear strength." PO Resp. 20–25, 36–37. We address Patent Owner's arguments in turn.

a. Sufficient Shear Strength Limitation

We have construed "sufficient shear strength" to mean having adequate strength to resist shear. The claims attribute this strength to the layer of adhesive with the functional requirement that it prevent movement of the connector, the movement creating gaps. Kinoshita teaches that the adhesive tape links the carpet units together to form an entire carpet that, even if using light weight carpet units, the installed carpet would not rise and peel off. Ex. 1006 ¶ 18. From this teaching we can infer that Kinoshita's tape is strong enough to perform as described, i.e., to connect the carpet units forming a contiguous mass of carpet flooring that withstands the rigors of regular cleaning. Although Kinoshita does not disclose details of the properties of the tape, such as a range of shear strength or peel strength for the installation disclosed, its lack of detail in this regard is not fatal to the contention that Kinoshita's adhesive tape renders obvious the use of a layer of adhesive with sufficient shear strength to prevent relative movement—and gaps—in a carpet tile installation.

First, the aspect of Kinoshita's adhesive tape preventing lifting is applicable to the prevention of relative movement because we have determined that the claims are not limited to only lateral movement—or lateral gaps. That is, we find Kinoshita's prevention of rising up is prevention of relative movement as claimed. The adhesive tape of Kinoshita is strong enough to resist movement when

vacuuming. Whether Patent Owner characterizes it as vertical movement is of no relevance, because the claims do not exclude the prevention of vertical movement.

Second, we are not persuaded that Kinoshita does not teach any lateral movement or gaps. It is common sense that as the vacuum suction is applied on the surface of the installed floor, the direction of the suction force has at least two directions: lateral and vertical. Anyone familiar with the act of vacuuming understands that as the vacuum cleaner moves on the surface, the horizontal movement causes a pull on the flooring surface, e.g., there is a force pulling horizontally on the carpet. Because Kinoshita expressly teaches that the installed carpet units resist the pull of the vacuum cleaner, we understand Kinoshita to teach that the linked carpet units resist both the lifting force and the pulling force. It makes sense that if the Kinoshita carpet units do not peel off, there will not be any gaps, vertical or otherwise.¹³ We do not need expert testimony or an express disclosure in the art to understand the common sense operation and result of vacuuming a carpet tile floor without rising up and peeling off. *See Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1329 (Fed. Cir. 2009) (holding that an analysis of obviousness “may include recourse to logic, judgment, and common sense available to the person of ordinary skill that do not necessarily require explication in any reference or expert opinion”).

Furthermore, we do not agree with Patent Owner’s contention that a person of ordinary skill in the art would be dissuaded from Kinoshita’s teachings because

¹³ The Endrenyi and Wood Declarations assert that Kinoshita does not state that the individual tiles will not peel off their respective tape pieces. Ex. 2014 ¶ 104; Ex. 2017 ¶ 107. We find this testimony not credible. Kinoshita’s carpet tiles are adhered only to the tape (not the floor), and, therefore, a teaching of “peeling off” could only refer to the carpet tiles detaching, separating, or otherwise moving from the tape.

it would be understood that the adhesive tape would fail. *See* PO Resp. 22–23 (arguing that Kinoshita’s tape would not prevent lateral tile movement because of the undisputed reputation of conventional adhesive tape failing in carpet tile installations). The testimony of declarants supporting Patent Owner’s contention focuses, at least in part, on Kinoshita’s silence regarding shear strength of the disclosed tape and that Kinoshita is not concerned with preventing lateral movement or lateral gaps. *See* PO Resp. 22 (citing Ex. 2014 ¶¶ 107–110; *see* Ex. 2017 ¶¶ 107-110). Again, the claims are not limited to preventing only lateral gaps or lateral movement. Moreover, we are not persuaded that Kinoshita refers only to conventional adhesive tape, and that, therefore, the adhesive tape in Kinoshita would have been known to fail. Kinoshita expressly describes an embodiment in which the backing of the tape and the “adhesive power” is designed for the specific purpose of making installation of carpet tiles easier and linking the underside of the carpet units. *See* Ex. 1006 ¶ 12. This suggests that Kinoshita’s adhesive tape is intended for use in carpet tile installations, and not merely some conventional tape that would be expected to fail at maintaining carpet tiles linked as described.

Lastly, we credit the testimony of Dr. Tippett and Dr. Jensen in that the Kinoshita disclosure confirms the knowledge of a person of ordinary skill in the art regarding the use of adhesive tapes for carpet tile installations. For the reasons that follow, we are not persuaded by Patent Owner’s characterizations of their testimony that engineering adhesive tape for carpet tile installations was vastly complex or would involve extensive trial and error. *See* PO Resp. 23–25. First, we acknowledge that Petitioner does not rely solely on Kinoshita as disclosing all the attributes of the adhesive tape. Indeed, the Dr. Tippett Declaration clarifies

that his opinion relies on the disclosures of Kinoshita to the degree it describes the configuration and performance of the installed carpet units, e.g., a “floating” installation, edge-to-edge configuration, unitary installation, etc. Ex. 1018

¶¶ 13.1–13.2. We credit Dr. Tippett, who has expertise and knowledge of carpet tile installations, when he declares that the installation described in Kinoshita would have no “gapping” at the seams, and, therefore, the tape, being single-sided, would have to include an adhesive that would resist movement of the tiles. *Id.*

¶¶ 13.3–13.5. It makes sense that a method of carpet tile installation for commercial or household use would aim for carpet tiles that, after installation, remain abutted. *See* Ex. 1006 ¶ 1 (“tile that is used in offices and homes”). Dr. Tippett’s Declaration further states that Kinoshita supports his conclusions of the basic requirements for the use of adhesive tape in a carpet tile installation.

Ex. 1018 ¶ 13.6. To support his conclusions, Dr. Tippett cites to Kinoshita teaching pre-connected tiles, which are installed as a block of tiles. *Id.* For this installation to be successful, the adhesive tape of Kinoshita, according to Dr. Tippett, “must include an adhesive with sufficient shear strength and sufficient peel strength to prevent movement of the tiles relative to one another and/or the tape pieces.” *Id.*

The Dr. Jensen Declaration also concludes that the teachings in Kinoshita confirm that a person of ordinary skill in the art would select an adhesive tape with the recited shear strength. First, Dr. Jensen opines that suitability for the intended purpose is a core consideration when selecting or designing tape for a given application. Ex. 1020 ¶ 17.2. His Declaration then lists the criteria to consider when selecting a tape that would maintain the Kinoshita carpet units connected and abutting (in an edge-to-edge configuration). *Id.* ¶¶ 17.3–17.5 (listing adhesive

compatibility with the tile backing with suitability for the environment and duration of use, as well as providing sufficient wetting and adequate peel and adhesion). Once Dr. Jensen arrives at the basic requirements of an adhesive tape selection, he looks to Kinoshita once more to confirm that Kinoshita recognizes these requirements. *Id.* ¶¶ 17.6–17.11 (establishing that, because Kinoshita discloses multiple pre-connected tiles being handled as a block, the adhesive tape would need to have sufficient shear adhesion and peel adhesion to prevent the carpet tiles from pulling or twisting apart from each other while the tiles are moved).

Based on the cited testimony, we are not persuaded that Petitioner is relying on a theory of inherency with regard to whether Kinoshita discloses the “sufficient shear strength” limitation. Therefore, the arguments by Patent Owner rebutting the alleged “inherency” are unpersuasive. *See* PO Resp. 22–24. Petitioner relies on what Kinoshita teaches to a person of ordinary skill in the art. That person is a person of ordinary creativity, not an “automaton.” *KSR*, 550 U.S. at 421. We “can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 418. Therefore, based on the evidence presented, we agree with Petitioner that Kinoshita teaches, to a person of ordinary skill in the art, the use of adhesive tape for carpet tile installations where the adhesive has “sufficient shear strength,” per our construction of this phrase.

b. Material Sufficiently Stiff Recited in Independent Claim 20

Claim 20 recites that the sheet comprises “material sufficiently stiff for a connector positioned partly in contact with an underside of a tile to project beyond the edge of the tile in roughly the same plane as the underside of the tile.” Ex. 1001, claim 20 (hereinafter “stiffness limitation”). Petitioner relies on

Pacione's disclosure of a flexible, but rigid anchor sheet as disclosing this limitation. Pet. 52.

Patent Owner challenges the asserted combination of Kinoshita and Pacione because nothing in Kinoshita teaches or suggests that the adhesive tape pieces should be stiff and no rationale is provided for the proposed modification. PO Resp. 37. We are not persuaded by these arguments.

First, Kinoshita does not need to teach or suggest a stiff adhesive tape for the modification to be obvious. *See* KSR, 550 U.S. at 418 (“[T]he [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.”). Second, if the proposed modification is a predictable variation, it is likely barred by § 103. *Id.* at 417. In the instant case, the Petition states that it would have been obvious to one of ordinary skill in the art to use a sheet having some degree of rigidity as described in Pacione to maintain the tiles flat and for ease of handling during installation. *See* Pet. 28; Ex. 1020 ¶ 19.6. No unpredictability has been alleged regarding Kinoshita's adhesive tape pieces modified to include the rigidity taught in Pacione. Furthermore, Patent Owner has not alleged that such a modification would be beyond the level of an ordinarily skilled artisan. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Regarding the level of ordinary skill, Patent Owner's attack of Dr. Jensen's opinions on the basis that he is not an expert on carpet tile installations has been addressed above and need not be repeated here.

Patent Owner also argues that a person of ordinary skill in the art would not incorporate the rigidity of Pacione's anchor sheets to the adhesive tape pieces of

Kinoshita. PO Resp. 38–39. The arguments are unpersuasive because the obviousness inquiry focuses on what the combined teachings would have suggested to those of ordinary skill in the art, not whether the feature of the rigidity of Pacione could be bodily incorporated in the Kinoshita adhesive tape. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *see also 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) (“[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.”)). It is also unpersuasive that Pacione’s anchor sheets have additional functions of providing stable backing for carpet pieces. *See* PO Resp. 38. Pacione need not solve the same problems addressed in Kinoshita and vice versa. *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.”). The rigidity of anchor sheets has been alleged to assist in maintaining a flat tile installation and ease of handling of during installation. *See* Pet. 28. That rigidity, however, is tempered with flexibility. For example, Pacione teaches that the anchor sheets are “a relatively thin flexible but relatively rigid anchor sheet for use under carpets.” Ex. 1004, col. 1, ll. 11–12; *see also* col. 3, ll. 56–62 (flexible in the sense that it can bend and be rolled). We are persuaded that Pacione teaches the stiffness limitation. And we are persuaded that the flexible, but rigid, thin film of the anchor sheet provides benefits of ease of handling that would motivate a person of ordinary skill in the art to consider selecting, for Kinoshita’s adhesive tape, a thickness that offers rigidity and flexibility as taught in Pacione.

c. Tensile Strength Recited in Independent Claim 43

The Petition alleges that additional recited limitations of independent claim 43 are taught by Robinson, as disclosed in the proffered claim charts. Pet. 56–57. More particularly, Petitioner asserts that the installation of carpet units shown in Figure 1 of Kinoshita combined with teachings of the tensile strength of Robinson’s film backing, renders obvious independent claim 43. *Id.* Patent Owner challenges this assertion by arguing that there is no rational underpinning supporting the conclusion of obviousness. PO Resp. 40–41. Patent Owner further proffers that Robinson has no applicability to either floorcoverings or carpet installations. *Id.* at 41. We do not agree with Patent Owner that the Petition does not address a reasonable rationale supporting the conclusion of obviousness.

The Petition states that the use of film as a backing for adhesive was known and that one of ordinary skill in the art would find it obvious to select the properties of the film suitable for the intended use of Kinoshita, i.e., connecting carpet tiles to one another. Pet. 21–22. To support this rationale, Petitioner proffers the Declaration of Dr. Tippett, who attests that “one who is even reasonably familiar with carpet tile installation systems could easily have identified an adhesive tape that would be suitable, or could have worked with an adhesive tape company to do so.” Ex. 1018 ¶ 13.11. According to Dr. Tippett, it is routine for adhesive tape companies to provide guidance regarding tape selection, such that an adhesive tape engineer or scientist would assist in making a suitable selection for the intended purpose of joining carpet tiles to one another. *Id.* ¶ 13.10. More particularly to the tensile strength teachings of Robinson, Dr. Tippett states that one of ordinary skill in the art would select film-backed adhesive tapes over paper-backed tapes, because the latter lack the strength needed. *Id.*

¶ 13.9. He further states that a standard choice of film or tape backing is biaxially oriented polypropylene, to which Robinson is directed. *See id.* ¶ 13.9.

The selection of biaxially oriented polypropylene film is further confirmed by Dr. Jensen, who has been shown to have particular knowledge of tape engineering. *See* Ex. 1020 ¶¶ 17.9–17.10. Dr. Jensen attests that the number of choices for film backing is a reasonable number, such as polypropylene, polyester, paper, polyethylene, cellophane, and laminates. *Id.* And one of ordinary skill in the art would have selected a biaxially oriented (either polyethylene or polypropylene) film backing for the Kinoshita installation, according to Dr. Jensen. *Id.* A proffered reason for this selection being obvious to a person of ordinary skill in the art is that such a film is readily available and of low cost. *Id.* Another proffered reason for selecting this film is that it does not stretch or deform as readily. *Id.*

8. *Dependent Claims 7–15, 21–39, and 44–58*

Concerning the dependent claims, Petitioner’s claim charts allege that—in combination with Kinoshita—Pacione, Narum, Robinson, Owen, Matthews, and Pears disclose the various recited limitations. Pet. 41–59.

Patent Owner disputes the evidence presented with respect to dependent claims 22–24, 44–45, and 46–48. PO Resp. 44–52. With regards to claims 44 and 45, Patent Owner repeats the arguments presented regarding the stiffness limitation. *Id.* at 44. For the same reasons discussed above with regards to claim 43, we find unpersuasive the arguments proffered regarding claims 44 and 45.

With regards to claims 22–24 and 46–48, Patent Owner contends that the relatively small size of the recited connectors and the limited percentage of the

seam length spanning the connectors would not have been obvious to a person of ordinary skill in the art and that no rationale is identified. *Id.* at 44–52.

a. Claims 22 and 46

Claims 22 and 46 recite a connector size that is no more than 5% of the surface of the tile. Kinoshita teaches that an adhesive tape piece has a surface area smaller than the carpet unit surface area. *See* Ex. 1006, Fig. 1. Nevertheless, there is no evidence that Kinoshita is drawn to scale. Therefore, other than the disclosure of the adhesive tape pieces being smaller than the carpet tiles, it is not possible from a study of Kinoshita to understand the precise dimensions and relative surface areas of the carpet pieces and the adhesive tape pieces.

Petitioner has shown that Owen teaches securing a carpet tile with only 4 to 20% of the underside surface in contact with the fibrous projections. *See* Ex. 1015, 4, ll. 5–7. We are persuaded that the underside-surface-area coverage of 4 to 20% taught in Owen is within the claim scope requiring the claimed connector to have no more than approximately 5% of the tile’s surface area.

Patent Owner does not dispute that Owen teaches a range commensurate with the recited 5% surface area, but, instead argues that a person of ordinary skill in the art would not be motivated to look to Owen’s teachings. PO Resp. 44–46. We are not persuaded by Patent Owner’s arguments. The alleged belief that “more-glued-surface-area is better,” even if true, does not negate the fact that Kinoshita teaches a glueless installation of carpet tiles. With that knowledge and the express disclosure in Kinoshita of adhesive tape pieces that are indisputably smaller in surface area than the carpet tiles, we find unpersuasive the argument that a “more-glue” belief would turn a person of ordinary skill in the art away from teachings of glueless attachments, such as those in Kinoshita and Owen. Kinoshita

is a clear and express departure from the “more-glue” belief. Furthermore, neither Kinoshita nor Owen discredits the use of a small connector.

As for reasons for why a person of ordinary skill in the art would be motivated to apply the teachings of Owen’s underside-surface-area coverage of 4–20% to Kinoshita, we turn to the rationales provided by Petitioner. First, Petitioner alleges that selecting the size of the adhesive tape pieces in Kinoshita is a matter of design choice. Pet. 28. This argument is conclusory and unsupported; therefore, it is given no weight. Second, Petitioner argues that the Owen teachings are directly applicable to the teachings of Kinoshita because of the similarities in Owen of disclosing connections at the corners of carpet tiles. *Id.* (citing as support Ex. 1018 ¶ 23.2). We agree with Petitioner that Owen’s teachings are applicable to carpet tile installations similar to Kinoshita’s installations, as these references teach similar configurations. *See* Pet. Reply 10–11. We note that Dr. Tippett, when asked in cross-examination regarding how to select the size of the tape in Kinoshita that he would start with a range of sizes, starting with a size too small to work with and select a series of sizes up while considering the most economical size. *See* Ex. 2012, 137:18–138:9. We do not view Dr. Tippett’s testimony as admitting an “extensive trial and error exercise” in selecting a suitable size for the connector. *See* PO Resp. 46. Indeed, Owen teaches a range of sizes for corner attachments in carpet installations, albeit with the use of hook and loop technology instead of adhesive. It makes sense that one of ordinary skill in the art considering Kinoshita’s small connectors would start with the range of sizes of 4 to 20% of the carpet area taught in Owen and consider the cost factor, as Dr. Tippett testified. The corner attachments of Owen have the same purpose as the adhesive tape units in Kinoshita, to attach together carpet pieces in a glueless installation. Owen

provides the size ranges that Kinoshita suggests by showing smaller connectors. Given these considerations, under *KSR* we ask whether the technique in Owen—of selecting a size for the corner attachments in the range of 4 to 20%—would be recognized by a person of ordinary skill in the art as applicable to improve Kinoshita’s adhesive tape pieces. *See KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”). We find that it would be applicable, and that the combination is nothing more than the application of a known range of sizes of corner attachments in carpet tile installation to improve the size of Kinoshita’s adhesive tape pieces.

We, therefore, find unpersuasive Patent Owner’s argument that the hook tape in Owen would not inform a person of ordinary skill in the art how to improve adhesive tape for carpet tile installations. PO Resp. 47–48. The arguments presented focus on how the hook tape works in Owen, such that it is different from adhesive in its attachment structure and stability. *Id.* We have stated above, however, that the size of the adhesive tape in Kinoshita already suggests a small connector. Owen merely provides a range to use with Kinoshita’s tape pieces. The physical differences in Owen, although relevant, do not overcome the strong suggestion in Kinoshita to use an adhesive tape piece smaller in surface area than the carpet tile.

b. Claims 23 and 47

Claims 23 and 47 recite a surface area of approximately 9 square inches. The Petition alleges obviousness of these claims by relying on the combination of Kinoshita, Pacione or Robinson, and Matthews. Pet. 52, 56–57. Patent Owner

challenges the combination arguing that the “more-glue” belief would teach against selecting a size for the Kinoshita adhesive tape to encompass a surface area of approximately 9 square inches. PO Resp. 48. For the same reasons stated above with respect to claims 22 and 46, we are not persuaded by this argument. Also, Patent Owner’s arguments regarding the alleged expected failure of the Kinoshita adhesive tape are unpersuasive, as we have discussed with regards to the independent claims. Furthermore, we are not persuaded that Matthews has no applicability to the claims at issue merely because the Matthews tape is incompatible with carpet tile. *See* PO Resp. 49; *see also* Pet. Reply 10–11 (argument and evidence by Petitioner that Matthews is applicable to carpet tiles despite being directed to lighter materials).

We find that Matthews discloses a carpet tape with a base sheet that is 2 ½ to 7 inches wide. Ex. 1016, 5:68, 7:2–3. As for a rationale to combine Kinoshita with Matthews, the Petition states that it would have been obvious to one of ordinary skill in the art to consider tape widths of Matthews in designing tape pieces for use in Kinoshita to provide stability along the seams of carpet pieces. Pet. 29 (citing Ex. 1018 ¶ 22; Ex. 1020 ¶ 26). Cutting the tape disclosed in Matthews into a square shape, which is the shape disclosed in Kinoshita, would result in a range of squares from 6.25 to 49 square inches, which includes the range of 9 square inches as disclosed in the claim. *See id.* at 28–29.

That is, Kinoshita expressly teaches an adhesive tape piece smaller than the carpet tile and a square shape (Ex. 1006 ¶ 17, Fig. 1), and, therefore, cutting the Matthews tape to achieve that square shape is nothing more than using Kinoshita itself as the teaching that motivates a person of ordinary skill in the art to cut the Matthews tape. Patent Owner’s arguments that no rationale is proffered in the

Petition are unpersuasive. Similarly unpersuasive is the argument that the only modification of the Kinoshita tape pieces would be to apply Matthews to extend the tape along the entire seam. *See* PO Resp. 50. This argument obfuscates the obviousness analysis presented in the Petition. The issue we decide is not whether the teaching in Matthews of applying tape to carpet is applicable to Kinoshita. As already stated, we determine whether in light of Kinoshita's teaching of square adhesive tape pieces, cutting the tape disclosed in Matthews to a square shape renders obvious the claimed invention. And we determine that it does.

c. Claims 24 and 48

Claims 24 and 48 recite that the installed connectors span up to approximately 10% of the total length of the adjacent tiles. The Petition alleges obviousness of these dependent claims by relying on the combination of Kinoshita, Pacione or Robinson, and Matthews. Pet. 53, 57. Patent Owner challenges the evidence presented on the basis that there is no reasonable rationale supporting the combination. PO Resp. 51–52. We are not persuaded by Patent Owner's arguments for the same reasons as stated above with regards to claims 23 and 47.

Furthermore, we determine that the Petition presents a reasonable rationale for the combination of Kinoshita and Matthews. As stated above, Matthews discloses a carpet tape with a base sheet that is 2 ½ to 7 inches wide. Ex. 1016, 5:68, 7:2–3. Cutting the tape disclosed in Matthews into a square shape is suggested by the square shape disclosed in Kinoshita. *See* Pet. 28–29. Given Kinoshita's teaching of the size of the carpet tiles being 50 cm, starting off with the smallest square cut from Matthews's tape, 2.5 in x 2.5 in, results in the tape spanning 2.5% of the total edge length of the tiles. The resulting size is undisputed. The question Patent Owner poses is whether a person of ordinary skill

in the art would be motivated to select the width of 2.5 inches, instead of 7 inches. PO Resp. 51. Under *KSR*, however, the appropriate question is whether a person of ordinary skill in the art would apply the teachings of Kinoshita and Matthews to achieve the claimed invention. We determine that such a person would. The teachings in Kinoshita are an improvement over the known carpet tile installations, and Matthews supplies a known tape for carpet installation with many advantages. For example, Matthews states that its tape is produced at a reduced cost and has anti-buckling features. Ex. 1016, 3:28–30. A person of ordinary skill in the art would be motivated by Kinoshita to select a square adhesive tape piece and Matthews provides a tape beginning with the width of 2.5 inches.

Based on the foregoing, and after thorough review of Patent Owner’s arguments and evidence, we are not persuaded by Patent Owner’s arguments that the combination of Kinoshita and Matthews is not proper.

d. Remaining Dependent Claims

We have reviewed the briefs and the supporting evidence concerning the additional limitations recited in dependent claims 7–15, 21, 25–39, and 49–58 as being obvious over combinations of Kinoshita and the various other references of record. *See* Pet. 46–47, 52–55, 57–59. Patent Owner does not challenge Petitioner’s evidence or arguments regarding the additional limitations recited in these dependent claims. We are persuaded that Petitioner has shown that the proffered prior art teaches those limitations.

9. Evidence of Secondary Indicia of Non-Obviousness

Notwithstanding what the teachings of the prior art would have suggested to one with ordinary skill in the art at the time of the ’473 patent’s invention, the totality of the evidence submitted, including objective evidence of nonobviousness,

may lead to a conclusion that the claimed invention would not have been obvious to one with ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–1472 (Fed. Cir. 1984). Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *Graham*, 383 U.S. at 17. Patent Owner argues that numerous objective indicia demonstrate the non-obviousness of its claimed invention. PO Resp. 53–57.

Before delving into the specific arguments and evidence of secondary considerations, we note that it is not sufficient that a product or its use merely be within the scope of a claim in order for objective evidence of nonobviousness tied to that product to be given substantial weight. There must also be a causal relationship, termed a “nexus,” between the evidence and the claimed invention. *Merck & Co. Inc. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1376 (Fed. Cir. 2005). A nexus is required in order to establish that the evidence relied upon traces its basis to a novel element in the claim, not to something in the prior art. *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013). Objective evidence that results from something that is not “both claimed and novel in the claim,” lacks a nexus to the merits of the invention. *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011).

All types of objective evidence of nonobviousness must be shown to have nexus. *In re GPAC Inc.*, 57 F.3d at 1580 (nexus generally); *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996) (commercial success); *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1364 (Fed. Cir. 2012) (copying); *Rambus Inc. v. Rea*, 731 F.3d 1248, 1256 (Fed. Cir. 2013) (long-felt need). The stronger the showing of nexus, the greater the weight accorded the objective evidence of

nonobviousness. *See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 306 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986).

a. Long-Felt Need

Patent Owner argues that the application of glue for carpet tile installations dominated the market and there was a need for viable glueless options and for carpet installations with no lateral tile movement. PO Resp. 53–54. To establish evidence of a long felt but unresolved need, a patent owner must show that there was a persistent problem that was recognized by those of ordinary skill in the art. *See In re Gershon*, 372 F.2d 535, 539 (CCPA 1967). The problem must not have been solved previously by another, and the claimed invention must, in fact, satisfy the long-felt need. *See Newell Cos., Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988).

Here, although there is some evidence that a prevailing installation for carpet tiles involved applying glue to the floor, Patent Owner’s Response fails to show when the problem first arose and how long this need was felt. *See Tex. Instruments, Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993) (“[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem.”).

Further, Patent Owner fails to show that the alleged need for a glueless installation was not solved by another. The record includes two references, Kinoshita and Pacione, in the prior art that disclose installations of carpet tiles without glue. The evidence presented shows that Pacione’s system, at a minimum, satisfied the alleged need for no lateral tile movement. Petitioner also has introduced evidence that at the time of the invention other flooring companies already had developed and sold glueless installation methods. Pet. Reply 11–12.

Furthermore, although two of Patent Owner's declarants state that the TacTile product, alleged to have solved the need, included an adhesive layer that prevents lateral tile movement, that testimony is conclusory and unsupported by any facts, and is given little weight. *See* Ex. 2017 ¶ 17; Ex. 2013 ¶¶ 115–116. The cited portions of the Declarations of Mr. Anderson (¶¶ 15–33) and Mr. Endrenyi (¶¶ 68–73), also fail to reveal any evidence that the TacTiles included the adhesive layer with sufficient shear strength that prevents relative movement. *See* Ex. 2022 ¶¶ 15–33; Ex. 2014 ¶¶ 68–73.

For the foregoing reasons, the objective evidence proffered by Patent Owner is insufficient to establish a long-felt, but unmet, need.

b. Unexpected Results and Skepticism

Patent Owner provides testimony of its Chief Innovations Officer and named inventor, Mr. Bradford, to show that there was skepticism. PO Resp. 54 (citing Ex. 2030 ¶¶ 29–30. This testimony fails to show that those who are alleged to express skepticism were experts in the field of the invention claimed in the '473 patent. Next, Patent Owner proffers Declarations from Messrs. Endrenyi and Anderson as expressing skepticism when first exposed to TacTiles. PO Resp. 54–55. The cited testimony, however, seems directed to aspects that are not claimed, such as stabilizing the tiles. *See* PO Resp. 55.

Finally, we are persuaded by Petitioner's argument that Patent Owner failed to show unexpected results. Pet. Reply 12. Patent Owner needed to show that the claimed invention exhibits some superior property or advantage that one of ordinary skill in the art would have found surprising or unexpected. *See In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). That carpet dealers and installers attempted to pull apart the connectors does not show either an advantage or superior property

that was unexpected by persons of ordinary skill in the art. Further, there is no evidence that the carpet installers or dealers were persons of ordinary skill in the art, e.g., there is no evidence of their knowledge of adhesive tape properties suitable for carpet tiles.

c. Commercial Success

Patent Owner asserts that 158 million TacTiles connectors have sold since introduction of the product in 2006. PO Resp. 55–56. Various features are alleged to contribute to this success, including the stiffness, small size, that they engage the tiles at discrete locations within the installation, and that they avoid the need for adhering the tiles to the floor. *Id.* This evidence is unpersuasive.

Even assuming that the TacTiles connectors include all the recited limitations of the claims-at-issue, there is insufficient evidence in the record to warrant a finding of commercial success. As we indicated before, glueless installations were known in the art at the time of the invention of the '473 patent. To the extent the alleged success is based at least partly on this feature, Patent Owner has not shown that such success is due to the merits of the claimed invention beyond what was readily available in the art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) (finding the prior art possessed the function relied upon by the patent applicant to establish unexpected results and, therefore, was not a basis for rebutting a prima facie finding of obviousness); *J.T. Eaton & Co., Inc. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997) (“[T]he asserted commercial success of the product must be due to the merits of the claimed invention beyond what was readily available in the prior art.”). Indeed, Petitioner points us to testimony of Mr. Bradford stating that the reasons for selling the product to carpet tile customers varied, but that the glueless

installation was less expensive overall. *See* Ex. 1047, 148:3–149:16 (identifying also carpet tile return policy, recycling, less waste).

Furthermore, Patent Owner’s Response neither argues nor points to evidence of market share. *See In re Baxter Travenol*, 952 F.2d at 392 (“Information solely on numbers of units sold is insufficient to establish commercial success.”); *see also In re Huang*, 100 F.3d at 140 (declining to find evidence of commercial success because “[a]though [the inventor’s] affidavit certainly indicates that many units have been sold, it provides no indication of whether this represents a substantial quantity in this market.”). The testimony of the sales of TacTiles may constitute commercial success in relation with evidence of market share, of which there is very little. The Declaration of Mr. Bradford attests to there being an estimated increase in market share to at least 13.4% of all commercial carpet tile sold annually in the United States. Ex. 2030 ¶ 114. This evidence is insufficient. There is no indication that the increase is a substantial quantity in the overall market. Further, there is no evidence of the market share before the TacTiles connectors were introduced in the market. The testimony also includes in the 13.4% increase sales of FLORDots connectors, which Patent Owner has not argued to embody the claims-at-issue. In short, Patent Owner provides no evidence that the 158 million of TacTiles connectors sold represent a substantial quantity in the overall market.

d. Copying

Lastly, Patent Owner alleges that multiple copycat products have emerged since the introduction of the TacTiles connectors. PO Resp. 56–57. Copying, as objective evidence of nonobviousness, requires evidence of effort to replicate a specific product. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010);

Iron Grip Barbell Co., Inc. v. USA Sports, Inc., 392 F.3d 1317, 1325 (Fed. Cir. 2004). In the instant proceeding, the testimony proffered by Patent Owner in support of this copying contention is devoid of any evidence from which we could infer that the alleged copies resulted from an effort to replicate the product. *See, e.g.*, Ex. 2030 ¶¶ 117–119 (asserting without factual support that introduction of copies was due to Patent Owner’s success and that all products are sold to prevent gapping or undesired moving); *see also, e.g.*, Ex. 2023 ¶ 9 (stating that an Eco-sticker product “appeared” to copy Patent Owner’s product). The allegations that the products look similar and are used to install carpet tiles without glue in no way show that any of the entities producing those products actually copied Patent Owner’s TacTiles connectors. Furthermore, arguments that the alleged copies infringe foreign counterparts, not at issue in this proceeding, are wholly inapplicable and unpersuasive. *See, e.g.*, Ex. 2023 ¶ 16.

10. Conclusion of Obviousness

After weighing the evidence of obviousness and nonobviousness of record, on balance, we conclude that the strong evidence of obviousness outweighs the insufficient evidence of nonobviousness. For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 6–15, 20–39, and 43–58 would have been obvious as follows:

- a) claims 6–9, 11–13, 43, 49–51, 57, and 58 over Kinoshita and Robinson;
- b) claim 10 over Kinoshita and Pears;
- c) claims 14, 15, and 52–56 over Kinoshita, Robinson, and Narum;
- d) claims 20, 21, 29, 30, and 36–39 over Kinoshita and Pacione;
- e) claim 22 over Kinoshita, Pacione, and Owen;
- f) claims 23 and 24 over Kinoshita, Pacione, and Matthews;

- g) claims 25–28, 44, and 45 over Kinoshita, Pacione, and Robinson;
- h) claims 31–35 over Kinoshita, Pacione, and Narum;
- i) claim 46 over Kinoshita, Robinson, and Owen; and
- j) claims 47 and 48 over Kinoshita, Robinson, and Matthews.

F. MOTION TO AMEND

Patent Owner moves to substitute challenged claims 20 and 22 with proposed substitute claims 59 and 60, respectively, if we determine that claims 20 and 22 are unpatentable. Mot. to Amend 1. Because we determine that claims 20 and 22 are unpatentable, we now consider Patent Owner’s Motion to Amend. For the reasons set forth below, the Motion is denied.

Proposed substitute claims 59 and 60 are reproduced below.

59. An installation of modular carpet tiles connected together with connectors,

wherein each tile comprises a surface area and each connector comprises a surface area, and wherein the surface area of a connector is no more than approximately 5% of the surface area of a tile, and

wherein at least one of the connectors is positioned:

i. to span adjacent edges of at least two adjacent tiles in the installation and extend along only a portion of the adjacent edges; and

ii. so as not to abut other connectors,

each connector comprising:

a. a sheet having two sides, wherein the sheet comprises a material sufficiently stiff for a connector positioned partly in contact with an underside of a tile to project beyond the edge of the tile in roughly the same

plane as the underside of the tile, and wherein the material resists stretching under rolling traffic such that each connector will not permanently stretch to thereby create permanent gaps between the adjacent tiles; and

b. a layer of adhesive located on one side of the sheet, wherein the layer of adhesive is capable of forming a bond between the sheet and the undersides of the tiles and comprises a sufficient shear strength so that, when a connector spans adjacent edges of the adjacent tiles so that the layer of adhesive contacts the undersides of the adjacent tiles, the connector prevents the adjacent tiles from moving laterally relative to the connector or each other and thereby creating gaps between the adjacent tiles after installation without a need to attach the tiles to a floor surface; and wherein the sheet comprises material sufficiently stiff for a connector positioned partly in contact with an underside of a tile to project beyond the edge of the tile in roughly the same plane as the underside of the tile.

60. The installation of claim 20 wherein each tile comprises a surface area and each connector comprises a surface area, wherein the surface area of a connector is no more than approximately 5% of the surface area of a tile, wherein at least one of the connectors is positioned:

- i. to span adjacent edges of at least two adjacent tiles in the installation and extend along only a portion of the adjacent edges; and
- ii. so as not to abut other connectors, and

wherein the layer of adhesive comprises the sufficient shear strength so that, when the connector spans adjacent edges of the adjacent tiles so that the layer of adhesive contacts the undersides of the adjacent tiles, the connector prevents the adjacent tiles from moving laterally relative to the

connector or each other and thereby creating gaps between the adjacent tiles after installation without attaching the tiles to a floor surface.

1. Analysis of Proposed Claim 59

Proposed claim 59 adds to challenged claim 20 four features: (1) connector positioning; (2) size of approximately 5% of the surface area of a tile; (3) shear strength that prevents lateral tile movement; and (4) sheet material that resists stretching. *See* Mot. to Amend 4. Patent Owner contends that these limitations are fully disclosed in the specification and that the prior art of record, alleged to be the closest prior art, does not render obvious the proposed claim. *Id.* at 5–8. We analyze each of these limitations in turn.

a. Connector Positioning

Patent Owner asserts that the application for the '473 patent describes connectors that are not positioned along the entirety of the tile edges. *Id.* at 5. We agree with Patent Owner on this point. Nevertheless, Patent Owner has the burden of showing patentability of this claim. None of the arguments presented address the fact that Kinoshita discloses adhesive tape pieces attached to edges of adjacent and abutting carpet tiles. The connector positioning limitation, being disclosed expressly by Kinoshita, renders no patentable distinction over the prior art of record.

b. Size Limitation

Proposed claim 59 recites the 5% size limitation recited in original claim 22. We have addressed already the lack of persuasiveness of Patent Owner's arguments regarding the patentability of this size limitation in light of the assertion of obviousness over Kinoshita, Pacione, and Owen. Therefore, we do not repeat that analysis here. Our conclusion bears repeating, however, that in light of Kinoshita and Pacione's glueless installations and in light of Kinoshita's express

disclosure of using small adhesive tape pieces to connect carpet tiles, Patent Owner has not persuaded us that a person of ordinary skill in the art would not have arrived at a connector sized to 5% of the surface area of the tile. That size is taught expressly in Owen; and we are not persuaded that application of Owen's size teachings with Kinoshita's adhesive pieces in carpet tile installations was outside of the ordinary skill in the art.

c. Lateral Movement

The "sufficient shear strength" limitation, we determined, was not limited to any particular direction of movement. In proposed claim 59, Patent Owner narrows the relative movement to encompass only lateral movement. The prevention of lateral movement, according to Patent Owner, was recognized as the exclusive result of full glue installations. *See* Mot. to Amend 8–9. We find these arguments unpersuasive. Although there was an appreciation for the durability and wearability of full-glue carpet installations, the evidence of record shows that the full-glue installations were specified when heavy traffic was expected. *See id.* at 9 (citing Exs. 203[2], 2014, 2017, 2030). Arguably, when considering a carpet tile installation for such conditions, the adhesive choice was crucial. Proposed claim 59 does not recite any such application conditions. There is no requirement that the "sufficient shear strength" prevent the mishaps associated with any particular use, much less heavy or wheeled traffic. Further, recommendations by some carpet installers of the full-glue installation as the "best" for preventing lateral shifting (PO Resp. 10) do not mean necessarily that a carpet tile installation with adhesive tape pieces, such as that of Kinoshita, would not have been recognized as an installation option. Indeed, the "Interiors" handbook cited by Patent Owner describes the option of "free lay" carpet tile installations. *See* Ex. 2032, 203 ("In

free lay installations, a strip of adhesive is applied about every 4.5 m (15 ft) and around the room perimeter”). Thus, we are not persuaded that a full-glue installation was the only viable option, and that, therefore, a person of ordinary skill in the art would not turn to the Kinoshita teachings.

As for prevention of lateral movement being a novel feature, we are not persuaded. In our discussion of Kinoshita and the “sufficient shear strength” limitation, we concluded that Kinoshita teaches or suggests both vertical and lateral movement prevention. We are not persuaded, therefore, that a modification of Kinoshita would be necessary to accomplish the recited prevention of lateral movement resulting in “mak[ing] Kinoshita’s tape larger to underlie most of not all of the tiles’ undersurfaces to provide lots of adhesive surface area in accordance with the more-glued-surface-area-is-better sentiment.” Mot. to Amend 11 (citing Ex. 2014 ¶¶ 216–217). The cited testimony of Mr. Endrenyi ignores the express teachings in the art of free lay carpet installation options and that the full-glue installations were specified for certain traffic conditions. Starting with the premise that a person of ordinary skill in the art would start the design of a carpet installation system with a full-glue installation is a red herring. Seeking a departure from full-glue, a reasonable starting point is the known free lay carpet installation, which uses adhesive tape at intervals and at the perimeter. Therefore, we find it reasonable for a person of ordinary skill in the art to turn to Kinoshita, which expressly teaches small adhesive tape pieces at the corners of the carpet tiles. Indeed, Kinoshita would have been especially applicable since it teaches avoiding glue altogether and no attachments to the floor. Patent Owner’s arguments to the contrary are, therefore, not persuasive.

d. Resists Stretching

Patent Owner has the burden of showing that it is entitled to the relief requested. 37 C.F.R. § 42.20(c). We begin with claim construction, as that is an important step in determining patentability. *Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1339 (Fed. Cir. 2003). A motion to amend claims must identify how the proposed substitute claims are to be construed, especially when the proposed substitute claims introduce new claim terms. *See Idle Free Sys., Inc. v. Bergstrom, Inc.*, Case IPR2012-00027, slip op. at 7 (PTAB June 11, 2013) (Paper 26).

In its Motion, Patent Owner introduces the phrase “wherein the material resists stretching under rolling traffic such that each connector will not permanently stretch to thereby create permanent gaps between the adjacent tiles.” Patent Owner does not provide any claim constructions or explanation for how this phrase, or terms such as “resists stretching under rolling traffic” and “permanent gaps,” should be construed. Without a reasonable construction of this alleged new claim feature in proposed claim 59, Patent Owner does not provide adequate information for us to determine whether Patent Owner’s proposed substitute claims are patentable over the prior art generally. Indeed, Petitioner has raised the difficulty of assessing the scope of the term “rolling traffic” without any argument or evidence proffered by Patent Owner in its Motion. Opp. to Mot. to Amend 3–4. Therefore, we are not persuaded that Patent Owner has met its burden to demonstrate patentability of the proposed substitute claims under 37 C.F.R. § 42.20(c).

As for Patent Owner’s burden of demonstrating patentability, we find Patent Owner’s showing deficient. *See Idle Free*, Paper 26 at 7. With regard to obviousness as the basis of potential unpatentability of the proposed substitute

claims, the patent owner should present and discuss facts which are pertinent to the first three underlying factual inquiries of *Graham*: (1) the scope and content of the prior art, (2) differences between the claimed subject matter and the prior art, and (3) the level of ordinary skill in the art, *with special focus on the new claim features* added by the proposed substitute claims. *See Graham*, 383 U.S. at 17–18. The patent owner should identify each new claim feature, and come forward with technical facts and reasoning about that particular feature. Some discussion and analysis should be made about the specific technical disclosure of the closest prior art as to each particular feature, and the level of ordinary skill in the art, in terms of ordinary creativity and the basic skill set of a person of ordinary skill in the art, regarding the feature.

Here, we are unpersuaded that Patent Owner has demonstrated by a preponderance of the evidence that the proposed substitute claims are patentable. Patent Owner does not address adequately what was known previously in the art, and no discussion is presented regarding the level of ordinary skill in the art with regard to the “resist stretching” feature added by its proposed substitute claim. In a very conclusory manner, Patent Owner states that “[n]o reference suggests combining an adhesive with sufficient shear strength with a material that resists stretching.” Mot. to Amend 15 (citing Ex. 2014 ¶ 224). Neither this statement nor the cited Declaration of Mr. Endrenyi sufficiently addresses the requirements of Patent Owner in order to prove patentability of the claim by a preponderance of the evidence. Nothing in Patent Owner’s Motion addresses the knowledge of a person of ordinary skill in the art with regard to sheet materials for adhesive tape for carpet tile installations. There is no discussion of the challenges encountered in the art with regard to tensile strength of adhesive tapes for carpet tile installations. Finally, notwithstanding Patent Owner’s position that Kinoshita is silent regarding

properties of the disclosed adhesive tape pieces, there is no discussion in Patent Owner's Motion of what Kinoshita teaches a person of ordinary skill in the art regarding resistance to stretch in carpet installations.

e. Conclusion Regarding Proposed Substitute Claim 59

We find that Patent Owner has not met its burden of proving by a preponderance of the evidence that proposed substitute claim 59 is patentable. Three out of the four limitations added to proposed substitute claim 59 were recited in one form or another in challenged claims. Similar arguments were provided unsuccessfully in an attempt to show patentability. As for the fourth, "resists stretching" limitation, Patent Owner failed to propose any claim construction and to discuss in detail the level of ordinary skill in the art and what was known regarding the added limitation.

2. Analysis of Proposed Claim 60

With regard to proposed substitute claim 60, Patent Owner includes the following features: (1) connector positioning, and (2) sufficient shear strength (prevent lateral movement). The arguments and evidence regarding these two features are the same as those proposed for the same features added in proposed substitute claim 59. For the reasons stated above with regards to the same limitations, we find that Patent Owner has not met its burden in showing that proposed substitute claim 60 is patentable.

3. Ruling on Motion to Amend

The Motion to Amend further requests cancellation of claims 1–5, 16–19, and 40–42. The request for cancellation is hereby *granted*.

The request for entry of proposed substitute claims 59 and 60, for the reasons stated above, is *denied*.

III. CONCLUSION

Petitioner has demonstrated by a preponderance of the evidence the unpatentability of the following claims over the following grounds:

- a) claims 20, 29, 30, and 36–39 are anticipated by Pacione;
- b) claims 6–9, 11–13, 43, 49–51, 57, and 58 would have been obvious over Kinoshita and Robinson;
- c) claim 10 would have been obvious over Kinoshita and Pears;
- d) claims 14, 15, and 52–56 would have been obvious over Kinoshita, Robinson, and Narum;
- e) claims 20, 21, 29, 30, and 36–39 would have been obvious over Kinoshita and Pacione;
- f) claim 22 would have been obvious over Kinoshita, Pacione, and Owen;
- g) claims 23 and 24 would have been obvious over Kinoshita, Pacione, and Matthews;
- h) claims 25–28, 44, and 45 would have been obvious over Kinoshita, Pacione, and Robinson;
- i) claims 31–35 would have been obvious over Kinoshita, Pacione, and Narum;
- j) claim 46 would have been obvious over Kinoshita, Robinson, and Owen;
and
- k) claims 47 and 48 would have been obvious over Kinoshita, Robinson, and Matthews.

Because we have found claims 6–15, 20–39, and 43–58 unpatentable as stated above, we need not decide whether alternative asserted grounds based on obviousness relying primarily on Pacione also render the challenged claims

unpatentable.

Patent Owner's Motion to Amend is granted-in-part as we grant Patent Owner's request for cancellation of claims 1–5, 16–19, and 40–42. All other requests in the Motion to Amend are *denied*.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Patent Owner's Motion to Amend is granted with respect to the cancellation of claims 1–5, 16–19, and 40–42 of the '473 patent;

FURTHER ORDERED that Patent Owner's Motion to Amend is denied with respect to the entry of proposed substitute claims 59 and 60; and

FURTHER ORDERED that claims 6–15, 20–39, and 43–58 of the '473 patent have been shown to be unpatentable.

This is a final decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 8,381,473 B2

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