

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

I4F LICENSING NV,
Petitioner,

v.

VILOX AB,
Patent Owner.

Case: Unassigned

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 11,421,425**

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the locking means further comprises dual consecutive locking lugs arranged in a lower portion of the tongue for horizontally interlocking engagement in the groove, [1.8] a first locking lug extending downwardly from a lower tip portion of the tongue and a second locking lug extending downwardly from a root portion of the tongue, [1.9] the first locking recess and the first locking lug are provided with matching curved horizontal locking surfaces and the second locking recess and the second locking lug are provided with matching inclined horizontal locking surfaces. 51

2. *Dependent Claim 4* 56

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3. *Dependent Claim 14* 57

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PETITIONER’S EXHIBIT LIST

Exhibit	Brief Description
EX. 1001	U.S. Patent No. 11,421,425 (“the ’425 Patent”)
EX. 1002	Declaration of Mr. Eddy Boucké (“Boucké Decl.”)
EX. 1003	Prosecution History for U.S. Patent No. 11,421,425
EX. 1004	U.S. Patent No. 7,441,384 to Miller et al. (“Miller”)
EX. 1005	U.S. Patent No. 6,216,409 to Roy et al. (“Roy”)
EX. 1006	U.S. Patent No. 6,006,486 to Moriau et al. (“Moriau”)
EX. 1007	U.S. Patent Publication No. 2002/0020127 to Thiers et al. (“Thiers”).
EX. 1008	European Patent No. 1338721 B1 to Moriau et al. (“EP721”)
EX. 1009	French Patent Publication No. 2819532 to Strub (“Strub”)
EX. 1010	U.S. Patent Publication No. 2006/0260253 to Brice (“Brice”)
EX. 1011	U.S. Patent No. 6,505,452 to Hannig et al. (“Hannig”)
EX. 1012	Canadian Patent No. 991373 to Hebgen (“Hebgen”)
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EX. 1014	WIPO Publication No. 02/055810 to Pervan (“WO 02/055810”)
EX. 1015	U.S. Patent No. 7,398,625 to Pervan (“Pervan”)
EX. 1016	U.S. Patent No. 6,711,869 to Tychsen (“Tychsen”)
EX. 1017	U.S. Patent No. 6,766,622 to Thiers (“the ’622 patent”)
EX. 1018	U.S. Patent No. 7,093,399 to Thiers et al. (“the ’399 patent”)
EX. 1019	U.S. Patent No. 8,756,899 to Nilsson et al. (“Nilsson”)
EX. 1020	U.S. Patent Publication No. 2003/0033777 to Thiers et al. (“the ’777 publication”).
EX. 1021	U.S. Patent Publication No. 2004/0031225 to Fowler (“Fowler”)
EX. 1022	U.S. Patent Publication No. 2016/0097204 to Meersseman et al. (“Meersseman”)

Exhibit	Brief Description
EX. 1023	U.S. Patent Publication No. 2017/0016235 to Hannig et al. (“the ‘235 publication”)
EX. 1024	U.S. Patent Publication No. 2020/0232226 to De Rick (“De Rick”)
EX. 1025	<i>Curriculum Vitae</i> of Mr. Eddy Boucké (“Boucké CV”)

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311, 314(a), and 37 C.F.R. § 42.100, in view of the prior art and arguments herein, Petitioner respectfully requests that the Board review and cancel as unpatentable under 35 U.S.C. § 102(a) and/or § 103(a) claims 1-15 (the “Challenged Claims”) of U.S. Patent No. 11,421,425 (“the ’425 Patent,” Ex. 1001).

II. MANDATORY NOTICES – 37 C.F.R. § 42.8

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1):

The real party-in-interest is Petitioner, i4F Licensing NV.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

Petitioner is not aware of any related matters.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Lead Counsel	Back-Up Counsel
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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Petitioner consents to service by e-mail to jmcilvaine@webblaw.com, litigation@webblaw.com, abrooks@webblaw.com, and bcoyne@webblaw.com.

III. PAYMENT OF FEES – 37 C.F.R. § 42.103

The required fee is being paid herewith. Petitioner also authorizes the United States Patent and Trademark Office to charge Deposit Account No. 23-0650 for any underpayment of fees in this proceeding.

IV. GROUNDS FOR STANDING UNDER 37 C.F.R. § 42.104(a)

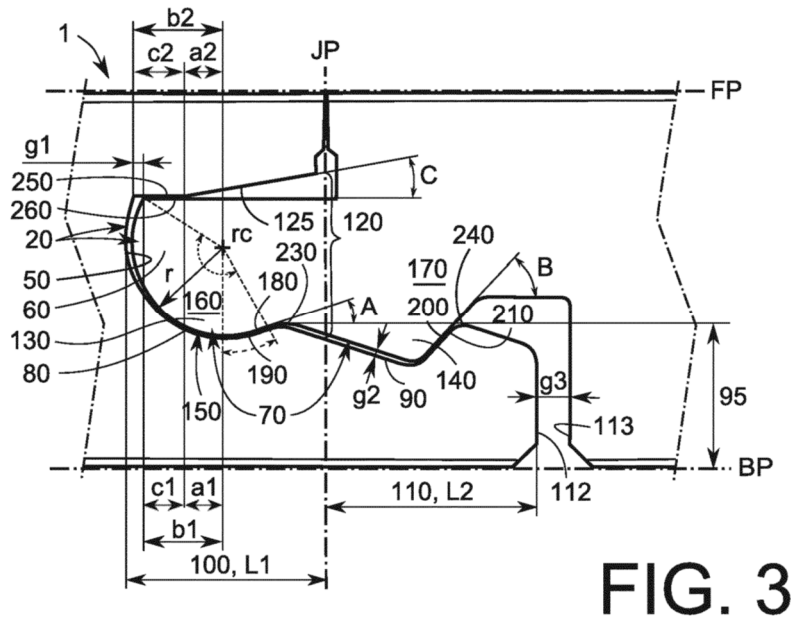
Petitioner certifies that the '425 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review challenging the patent claims on the grounds in this Petition.

V. THE '425 PATENT

A. Overview

The '425 Patent discloses a “joining system for floor panels” having a tongue and groove on opposites of the panel, two locking recesses formed on a lower portion of the groove and two locking lugs formed in a lower portion of the tongue for

engagement with the recesses. Ex. 1001, Abstract. This is shown, for example, in FIG. 3 of the '425 Patent reproduced below:



Ex. 1001, Fig. 3.

B. Prosecution History of the '425 Patent

The '425 Patent was filed as Patent Application No. 17/052,836 (the "'836 Application") on November 4, 2020 and issued on August 23, 2022. Ex. 1001, (21), (45), (86). The '836 Application was the U.S. National Phase of International Application No. PCT/EP2019/061431, filed on May 3, 2019, which claims priority to Swedish Application No. 1830152-3, filed on May 4, 2018. *See* Ex. 1001, (22), (30), (86). International Application No. PCT/EP2019/061431 was published on November 7, 2019 as International Publication No. WO 2019/211460 A1. Ex. 1001, (87).

During prosecution, the Examiner located a number of references that were not cited by the Applicant after conducting a search on December 2, 2021, including U.S. Patent No. 7,441,384 to Miller et al. (“Miller”) and U.S. Patent No. 6,216,409 to Roy et al. (“Roy”). Ex. 1003, p. 118. Although citing Miller and Roy in his search results, the Examiner did not further discuss or reference Miller or Roy.

On December 7, 2021, the Examiner issued a non-final Office Action rejecting all claims 1-15 under 35 U.S.C. §112(b) as being indefinite and 35 U.S.C. § 102(a)(1) as being anticipated by U.S. No. 2002/0020127 to Thiers et al. (“Thiers”). Ex. 1003, pp. 112-16. In particular, the Examiner applied the embodiment of Thiers of FIGS. 20-23. *Id.* On February 7, 2022, the Applicant amended claims 1 through 15 in an attempt to overcome the rejections under 35 U.S.C. § 112(b) and submitted argumentation that the rejection under 35 U.S.C. § 102(a)(1) was allegedly in error because it was premised on a misinterpretation of the applied embodiment of Thiers. Ex. 1003, pp. 99-103. Specifically, Applicant argued that “[s]ignificantly absent from Thiers structure are Applicant’s claimed dual consecutive locking recess and dual consecutive locking lugs.” Ex. 1003, p. 100.

Petitioner notes that the embodiment of Thiers applied by the Examiner during prosecution (Figs. 20-23 of Thiers) is clearly distinct from the panel locking structure of Miller (discussed below). In particular, the panel locking structures of

the embodiment of Thiers applied by the Examiner define a single locking recess to receive a single locking lug for establishing horizontal locking between adjacent panels. In contrast, the panel locking structure of Miller includes dual consecutive locking recess and dual consecutive locking lugs, as is discussed in greater detail below. While Thiers discloses a locking profile at FIG. 4 that is in some respects similar to Miller, that embodiment of Thiers was not addressed during prosecution of the '425 Patent, and no embodiment of Thiers discloses dual locking recesses as disclosed in Miller. For these reasons, Petitioner submits the disclosure of Miller is not cumulative to the prior art applied by the Examiner against the '425 Patent.

On February 15, 2022, Applicant filed a supplemental amendment withdrawing all of the claims filed with the February 7, 2022 and submitting a set of replacement claims. Ex. 1003, p. 85. In response, on April 5, 2022, the Examiner issued an *Ex parte Quayle* action requiring an abstract but allowing claims 1-15 and stating the reasons for allowance as “no prior art discloses combination structures for a joining system, which including dual consecutive locking lugs arranged in a lower portion of the tongue for horizontally interlocking engagement in the groove, a first locking lug extending downwardly from a lower tip portion of the tongue and a second locking lug extending downwardly from a root portion of the tongue, the first locking recess and the first locking lug are provided with matching curved horizontal locking surfaces and the second locking recess and the second locking lug

are provided with matching inclined horizontal locking surfaces as set forth in the claims.” Ex. 1003, pp. 77-78. On June 10, 2022, a Notice of Allowance issued. Ex. 1003, p. 7.

VI. LEVEL OF ORDINARY SKILL IN THE ART

As of May 4, 2018, the education level and work experience of a person of ordinary skill in the art (POSITA) relevant to the ’425 Patent was at least an undergraduate degree in the mechanical, materials, or engineering arts or equivalent experience, and a minimum of 2 years of practical experience in the design, analysis or manufacturing of flooring technologies. Ex. 1002, ¶16. In this Petition, reference to “POSITA” refers to a person with these qualifications at the relevant time period.

VII. CLAIM CONSTRUCTION

The Board applies the same claim construction standard used to construe a patent claim in district court. 83 FR 51340 at 59. In accordance with 37 C.F.R. § 42.104(b)(3), Petitioner submits that all of the claim terms should be given their plain and ordinary meaning.

Petitioner does not contend that this construction necessarily reflects the complete construction for any other purpose, such as infringement issues raised in related litigation. Because the prior art cited in this Petition discloses the ’425 Patent’s preferred embodiments within the indisputable scope of the claims, the Board need not construe the outer bounds of the claims as part of these proceedings.

83 FR 51340 at 51 (“the PTAB will continue to construe claims in the context of patentability ... not infringement.”), 53 (“Moreover, it also may not be necessary to determine the exact outer boundary of claim scope because only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy (e.g., whether the claim reads on a prior art reference)”).

VIII. STATEMENT OF THE PRECISE RELIEF REQUESTED FOR EACH CLAIM CHALLENGED

A. Challenged Claims

This Petition challenges claims 1-15 of the '425 Patent (“the Challenged Claims”).

B. Statutory Grounds for Challenges

Grounds	Claim(s)	Basis
Ground 1	1, 2, 5-12, and 15	35 U.S.C. § 102(a): Anticipation by U.S. Patent No. 7,441,384 Miller et al. (“Miller”)
Ground 2	1-15	35 U.S.C. § 103: Obviousness over Miller
Ground 3	1-15	35 U.S.C. § 103: Obviousness over Miller in view of U.S. Patent No. 6,216,409 to Roy et al. (“Roy”)

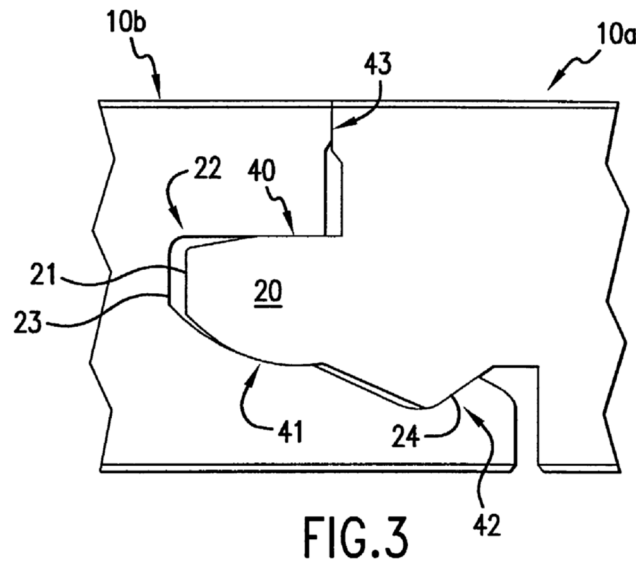
IX. OVERVIEW OF THE PRIOR ART

A. Miller

U.S. Patent No. 7,441,384 to Miller et al. (“Miller”) was filed on August 14, 2002, published on February 19, 2004, and issued on October 28, 2008 and therefore qualifies as prior art to the '425 Patent under at least 35 U.S.C. § 102(d). Ex. 1004,

p. 1, (22), (45), (65). Miller is cited on the face of the '425 Patent, but was not applied or discussed during prosecution of the '425 Patent. Ex. 1001, p. 2, (56).

Miller discloses a locking system for floor covering panels having complementary coupling or locking members. *See, e.g.*, Ex. 1004, Abstract; 2:60-5:57; FIGS. 1-4. FIG. 3 of Miller, reproduced below, illustrates exemplary coupling or locking members having double consecutive locking recesses and matching locking lugs on the groove and tongue respectively:



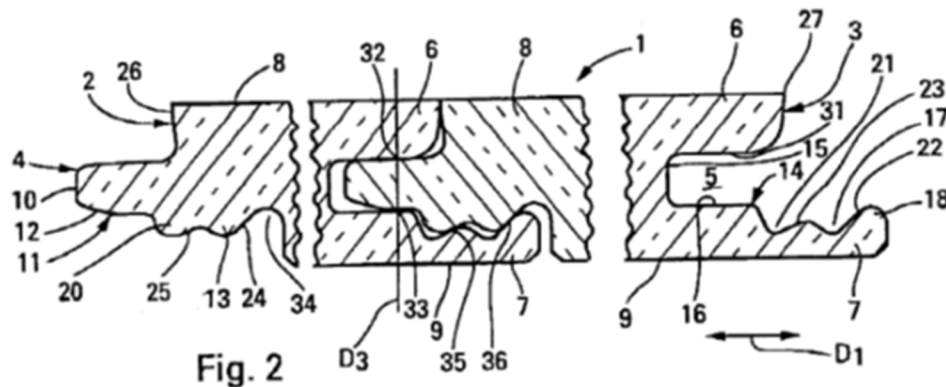
Ex. 1004, Fig. 3.

B. Roy

U.S. Patent No. 6,216,409 to Roy et al. ("Roy") was filed on January 25, 1999 and issued on April 17, 2001 and therefore qualifies as prior art to the '425 Patent under at least 35 U.S.C. § 102(b). Ex. 1005, p. 1, (22), (45). Roy is cited on the face

of the '425 Patent, but was not applied or discussed during prosecution. Ex. 1001, p. 2, (56).

Roy is directed to a panel for floors that includes a double locking recess/locking lug configuration as shown for example in the raised portions 13, 20 and the recesses 17, 23 of Fig. 2 reproduced below:



Ex. 1005, Fig. 2; 3:23-31, 3:37-45.

X. THE CHALLENGED CLAIMS ARE UNPATENTABLE BASED ON THE DISCLOSURES OF MILLER AND ROY

A. Ground 1: Claims 1, 2, 5-12, and 15 Are Anticipated by Miller

Miller teaches floor elements having the claimed structural features of claims 1, 2, 5-12 and 15. Miller discloses each and every element of the challenged claims, as discussed below under each heading corresponding to a specific claim element.

1. Independent Claim 1

a. [1.1] A joining system for floor panels,

Miller is directed to “a new floor covering panel and floor covering system.” Ex. 1004, Abstract. As illustrated in Fig. 2 of Miller, defined within the first side edge 13 is a first coupling member 20, which includes a protrusion 21 extending therefrom. The second side edge 14 includes a second complementary coupling member 22 defined therein that includes a recess 23 sized and shaped to receive the protrusion 21 of a second one of the floor covering panels therein. *Id.*, 2:66-3:5; *see also* Ex. 1002, p. 35, Chart 1, element 1.1.

b. [1.2] said floor panels comprising coupling parts on at least two opposite sides for joining floor panel together,

As illustrated in Fig. 2 of Miller, a first coupling member 20 is defined within the first side edge 13 and includes a protrusion 21 extending therefrom. The second side edge 14 includes a second complementary coupling member 22 defined therein that includes a recess 23 sized and shaped to receive the protrusion 21 of a second one of the floor covering panels therein. Ex. 1004, 2:66-3:5; *see also* Ex. 1002, p. 35, Chart 1, element 1.2.

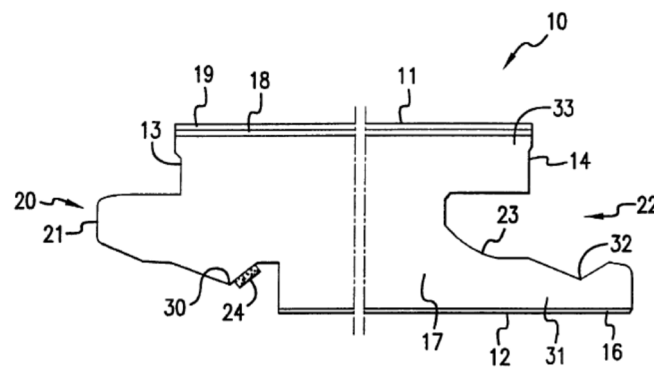


Fig. 2 of Miller

- c. **[1.3] said coupling parts including a groove and a tongue, where the groove is shaped for insertion of the tongue of an adjoining floor panel, said tongue of the adjoining floor panel being shaped for locking engagement with the groove in a direction perpendicular to said sides and parallel to a horizontal floor plane defined by the joined panels,**

Miller discloses “the floor covering panel may be a tongue and groove wooden flooring material” Ex. 1004, 3:20-23. Further, “[d]efined within the first side edge 13 is a first coupling member 20, which includes a protrusion 21 extending therefrom. The second side edge 14 includes a second complementary coupling member 22 defined therein that includes a recess 23 sized and shaped to receive the protrusion 21 of a second one of the floor covering panels therein.” *Id.*, 2:66-3:5. “This locking structure defined by the rib 30 of panel 10*a* and the detent 32 of panel 10*b* prevents substantial separation of the two panels 10*a* and 10*b* in a direction perpendicular to the side edges 13, 14 of the panels 10*a*, 10*b* and parallel to the respective first surfaces 11.” *Id.*, 5:30-34. These features are further highlighted in annotated Fig. 2 of Miller provided below.

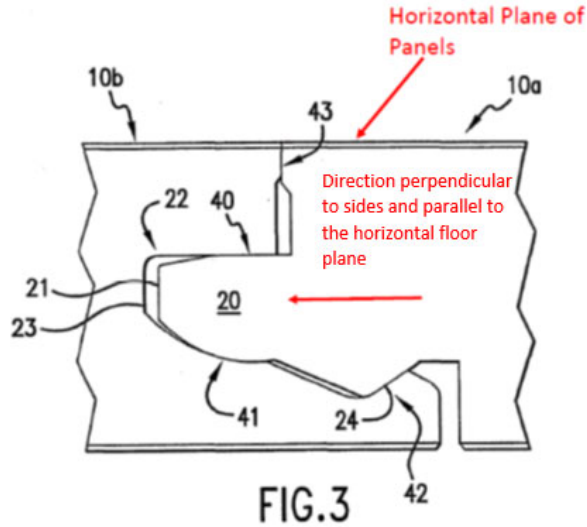


Fig. 3 of Miller

See also, Ex. 1002, pp. 36-37, Chart 1, element 1.3.

- d. [1.4] said coupling parts exerting a tension force towards each other in a mutually engaged position, the tension force being achieved by elastic compression of the material of the coupling parts,**

Miller discloses “[t]his [floor paneling] configuration ensures that the contact force between the adjacent panels 10a, 10b at the contact zone 42 urges the panels together and promotes a tight joint.” Ex. 1004, 5:27-30; *see also* Ex. 1002, pp. 37-39, Chart 1, element 1.4.

The ’425 Patent also recites in the Background section that “[a] joining system for floor panels of the described type is known from EP 1 338 721 B1 . . . The coupling parts exert a tension force towards each other in a mutually engaged position, the tension force being delivered by elastic compression of the material of the coupling parts.” Ex. 1001, 1:27-37. Thus, the ’425 Patent describes this feature,

element 1.4, as admitted prior art with specific reference to EP 1 338 721. *Id.*, 1:25-40.

EP 1 338 721 is an equivalent of U.S. Patent No. 6,006,486 to Moriau et al. (“Moriau”). *Compare* Ex. 1008 at p. 1, (30) (noting priority applications BE 9600527 and BE 9700344) *with* Ex. 1006 at p. 1, (30) (same). Moriau is incorporated by reference in Miller in its entirety. Ex. 1004, 4:54-59. Moriau, and thus Miller, discloses a tongue and groove coupling system that creates a horizontal locking force and tensioning force by elastic compression of the material of the coupling parts. Ex. 1006, 2:30-37, 3:4-7, 9:63-10:67 (describing the tensioning force between coupling parts caused by elastic compression of the material with reference to FIGS. 22-25). Therefore, for this additional reason Miller discloses exerting a tension force towards each other in a mutually engaged position, the tension force being delivered by elastic compression of the material of the coupling parts.

While Miller discloses the use of an adhesive composition 24 with the floor panels 10*a*, 10*b*, its use is optional. *See, e.g.*, Ex. 1004, 3:5-8; 5:58-6:7; 6:8-23; 6:24-40; *see also* Ex. 1002, ¶38. Further, the adhesive composition 24 is merely provided to maintain the locking joint between the floor panels 10*a*, 10*b* established by the coupling parts 20, 22 over time or to increase locking strength – not to create a horizontal locking or tension force. *See* Ex. 1004, 5:54-57; 1:40-59; Ex. 1002, ¶39.

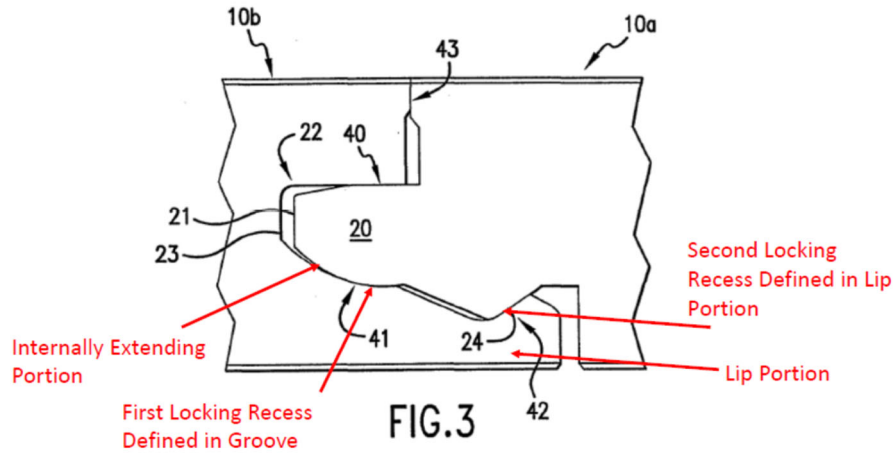
Further, claim 1 is a comprising claim, which does not exclude a locking profile using an adhesive from its scope. *See Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997); MPEP 2111.03. Moreover, even if the adhesive were required, the addition of adhesive to one or more of Miller's locking surfaces, such as the curved horizontal locking surfaces pointed to below in Sections X.A.1.f.-X.A.1.i., underscores that those surface are, indeed, "locking" surfaces. *See Ex. 1002, ¶51.*

As noted above, Miller also incorporates Moriau by reference in its entirety as an example of a non-limiting example of a locking system contemplated by Miller's disclosure and Moriau does not disclose that an adhesive is necessary to achieve the described tensioning aspects its locking mechanism.

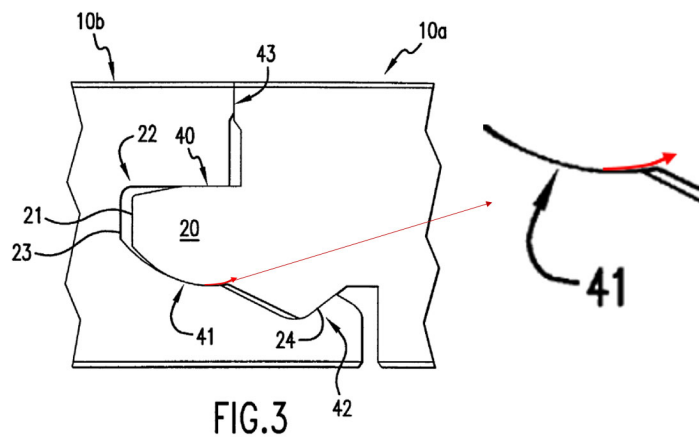
- e. **[1.5] locking means for locking the tongue of the adjoining floor panel within the groove, wherein the locking means comprises dual consecutive locking recesses arranged in a lower portion of the groove,**

Miller discloses "[t]he protrusion 21 of panel 10*a* contacts the upper lip 33 and the lower lip 31 of panel 10*b* at zones 40 and 41, respectively. Contact zones 40 and 41 help locate the panels into substantially the same horizontal plane. The rib 30 (Fig. 2) of panel 10*a* engages the detent 32 of panel 10*b* at contact zone 42. In this embodiment, the contact zone 42 is substantially planar; however, any contact zone may be formed in any shape depending on the profile desired." Ex. 1004, 5:15-23.

The claimed features are further highlighted in the two annotated Fig. 3 of Miller provided below.



Annotated FIG. 3 of Miller



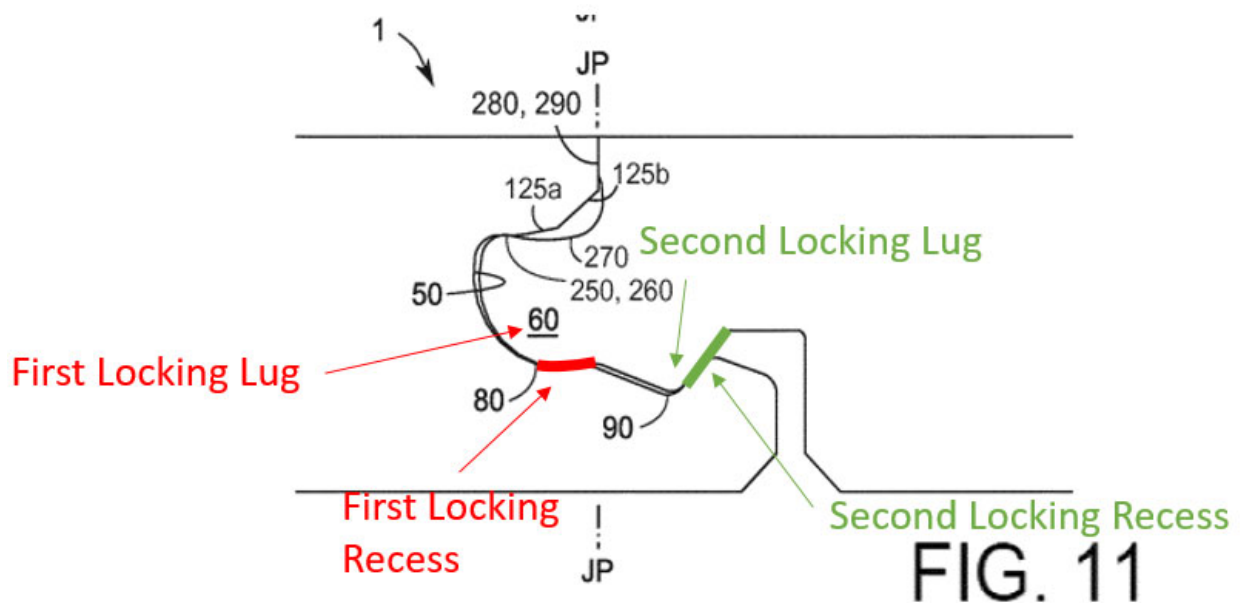
Annotated FIG. 3 of Miller

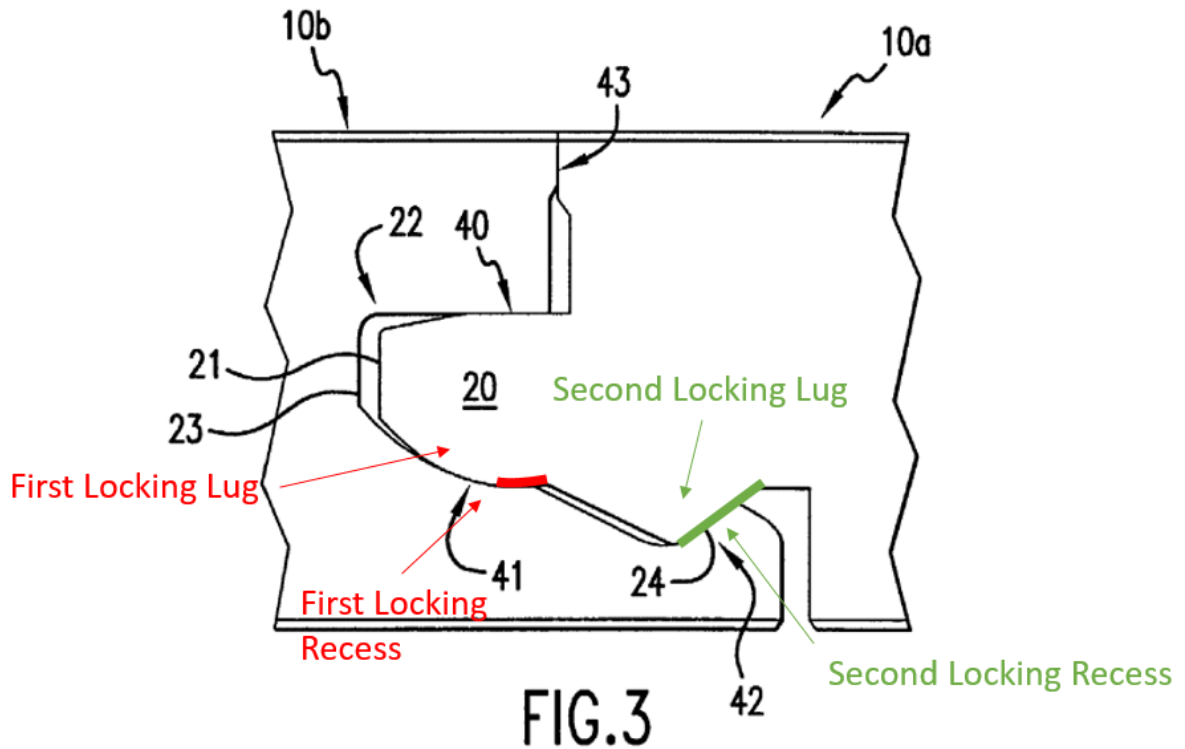
As demonstrated in the above annotated and blown-up versions of FIG. 3, Miller discloses a first locking recess and a matching first locking lug.

The upward curvature, shown above in red, to the right of reference arrow 41 will provide a locking force in the horizontal direction due to engagement of the

tongue's curvature with that of the curvature of the recess represented by red arrow to the right of arrow 41. *See* Ex. 1002, ¶46. Any disengagement will require at least some horizontal force to disengage the first locking lug of the tongue from the recess. *Id.*; *see also, infra*, Section X.A.1.i. (discussing with reference to element 1.9 the result of the red-highlighted upward curvature of FIG. 3 above).

This understanding is consistent with the embodiments illustrated in the '425 Patent. *Compare* Ex. 1001, FIG. 11 (illustrating dimensions of a first locking recess and a first locking lug similar to those of FIG. 3 of Miller) *with* Ex. 1004, FIG 3:





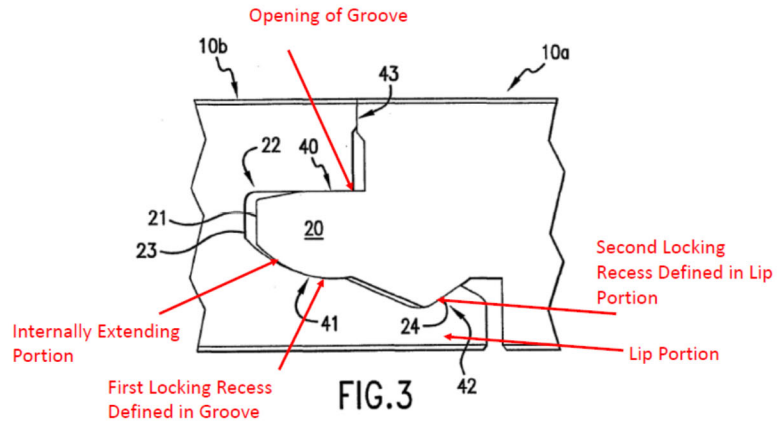
Annotated FIG. 11 of the '425 Patent (Top) and FIG. 3 of Miller (Bottom)

The embodiment of FIG. 11 of the '425 Patent shows a curvature in the locking recess 80 (with matching curvature on the first locking lug) that is virtually identical to the curvature of the first locking recess/curve locking surfaces identified for Miller above. The '425 Patent even describes FIG. 11 as including a groove 60 (and therefore, also, a locking surface 80) that is “shallower” than that of FIG. 10. Ex. 1001, 8:1-28. The groove of FIG. 11 is also shallower than those of FIGS. 1-9 of the '425 Patent. *See* Ex. 1001, FIGS. 3-9, 11; Ex. 1002, ¶48. Surface 80 of FIG. 11 of the '425 Patent is no less a locking surface than locking surface 80 of any other embodiment of the '425 Patent, which uses reference numeral “80” to consistently

refer to locking surfaces. *See* Ex. 1001, 4:43 (“In the drawings, like numbers refer to like elements.”); 7:24-31 (“The embodiments shown in FIGS. 10 and 11 are compatible with the other embodiments of this disclosure, and most features and functions are shared with the other embodiments.”); Ex. 1002, ¶48, Chart 1, pp. 39-42, element 1.5.

- f. **[1.6] a first locking recess located in an internally extending portion within the groove and a second locking recess located in a lip portion protruding from an entrance opening of the groove,**

With reference to the following annotated Fig. 3 of Miller reproduced below, Miller discloses two separate locking recesses. A first locking recess is provided within the groove 23 of the floor panel 10*b*. A second locking recess is provided in the lip portion of the same floor panel 10*b*. Based on the upward angle of the surfaces that define the first and second locking recesses, these locking recesses create a horizontal locking arrangement between the floor panels 10*a*, 10*b*.

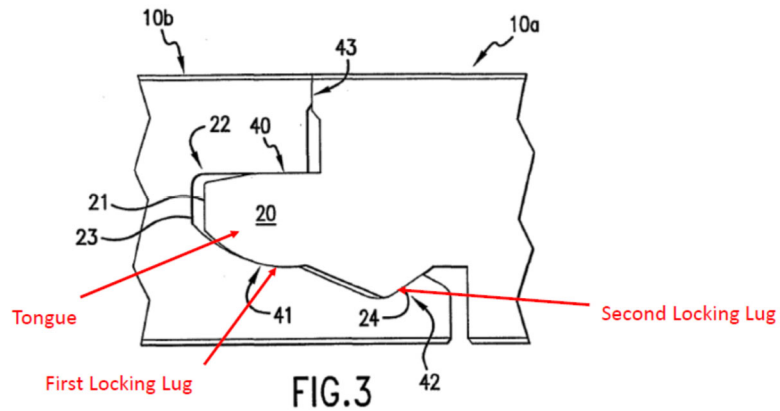


Annotated Fig. 3 of Miller

See also, supra, Section X.A.1.e (regarding locking function of first locking recess of Miller); *infra*, Section X.A.1.i (same); Ex. 1002, Chart 1, p. 43, element 1.6.

- g. [1.7] the locking means further comprises dual consecutive locking lugs arranged in a lower portion of the tongue for horizontally interlocking engagement in the groove,**

With reference to the following annotated Fig. 3 of Miller reproduced below, Miller discloses two consecutive locking lugs arranged on a lower portion of the tongue 20. A first locking lug is provided on a portion of the tongue 20 positioned in the groove 23 when the floor panels 10a, 10b are coupled. A second locking lug is provided on a portion of the tongue 20 that is positioned outside of the groove 23 when the floor panels 10a, 10b are coupled. In the coupled state, the locking lugs horizontally engage with the locking recesses to create a horizontal locking arrangement between the floor panels 10a, 10b.

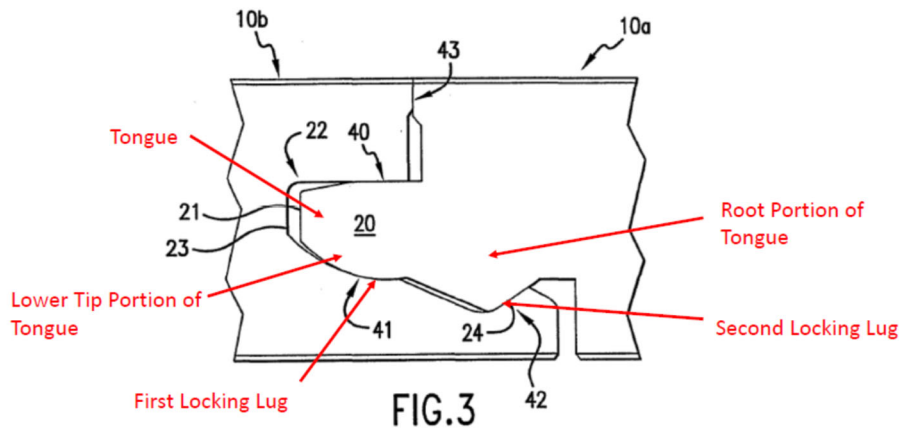


Annotated Fig. 3 of Miller

See also, supra, Section X.A.1.e (regarding locking engagement of the first locking recess and first locking lug of Miller); *infra*, Section X.A.1.i (same); Ex. 1002, Chart 1, pp. 43-44, element 1.7.

- h. **[1.8] a first locking lug extending downwardly from a lower tip portion of the tongue and a second locking lug extending downwardly from a root portion of the tongue,**

With reference to the following annotated Fig. 3 of Miller reproduced below, Miller discloses a first locking lug extending downwardly from a lower tip portion of the tongue 20 positioned in the groove 23 when the floor panels 10a, 10b are coupled. The second locking lug is provided on a root portion of the tongue 20 that is positioned outside of the groove 23 when the floor panels 10a, 10b are coupled.

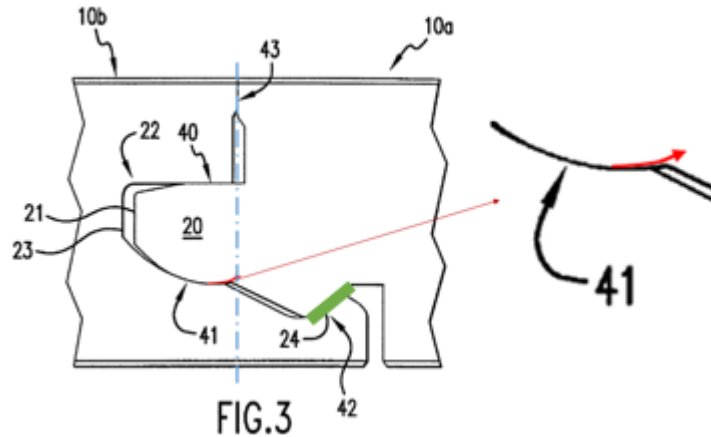


Annotated Fig. 3 of Miller

See also, supra, Section X.A.1.e (discussing a “first locking lug”); Ex. 1002, Chart 1, p. 44, element 1.8.

- i. **[1.9] the first locking recess and the first locking lug are provided with matching curved horizontal locking surfaces and the second locking recess and the second locking lug are provided with matching inclined horizontal locking surfaces.**

The red and green surfaces highlighted in the annotated Fig. 3 of Miller provided below are matching curved horizontal locking surfaces and inclined matching locking surfaces, respectfully.



Annotated Fig. 3 of Miller

The compression and tension force generated by the locking mechanism (*see* Ex. 1004, 5:27-30, Ex. 1006, 9:63-10:67, *supra* Section X.A.1.d.) causes a horizontal pressure to be exerted between both the matching curved surfaces and matching inclined surfaces in a direction parallel to the board surfaces going from panel 10a toward panel 10b. Ex. 1002, ¶44. Further, the upward curvature of the first locking recess and the inclination of the second locking recess, create obstructions to the tongue moving horizontally relative to the groove, thereby causing a horizontal locking between the two panels. Ex. 1002, ¶¶44-46, Chart 1, pp. 44-47, element 1.9.

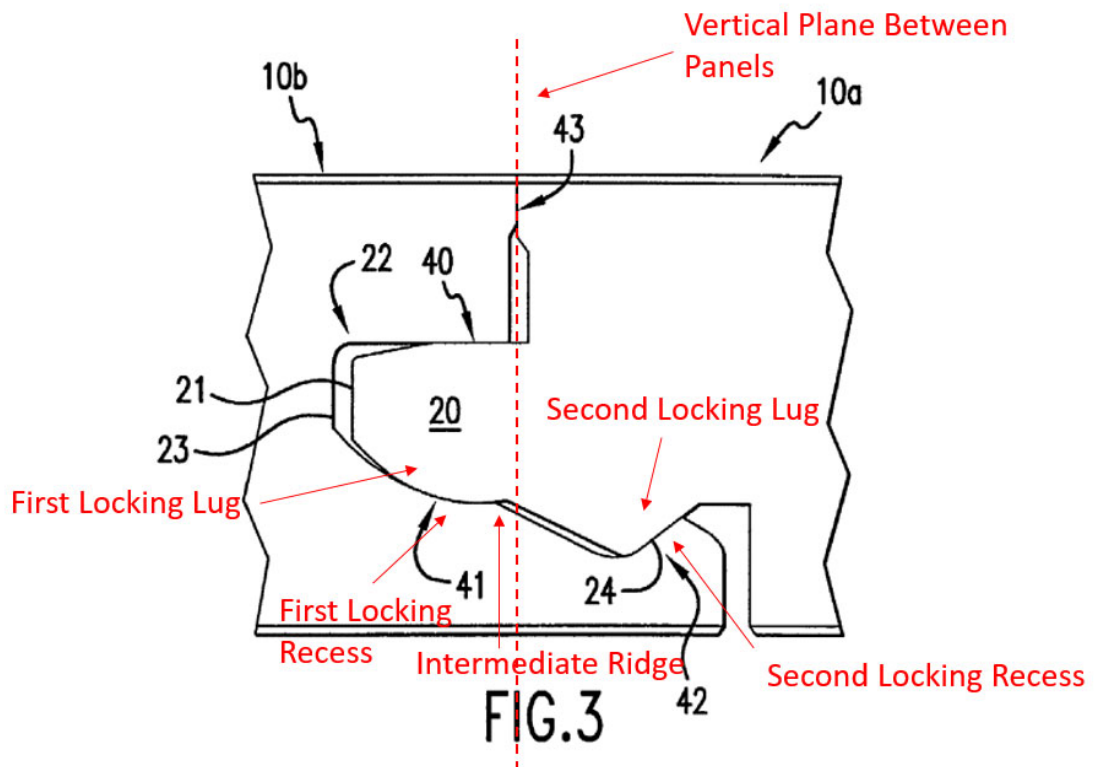
Furthermore, the highlighted surfaces in the annotated drawing of Miller, above, is consistent with and virtually identical to the locking surfaces of the FIG. 11 embodiment of the '425 Patent as illustrated in Fig. 11 of the '425 Patent.

See, supra, Section X.A.1.e (discussing, with respect to element 1.5, that FIG. 11 demonstrates first locking recess and first locking lug dimensions similar to those disclosed in Miller, FIG 3); Ex. 1002, ¶47-48, Chart 1, pp. 44-47, element. 1.9.

2. Dependent Claim 2

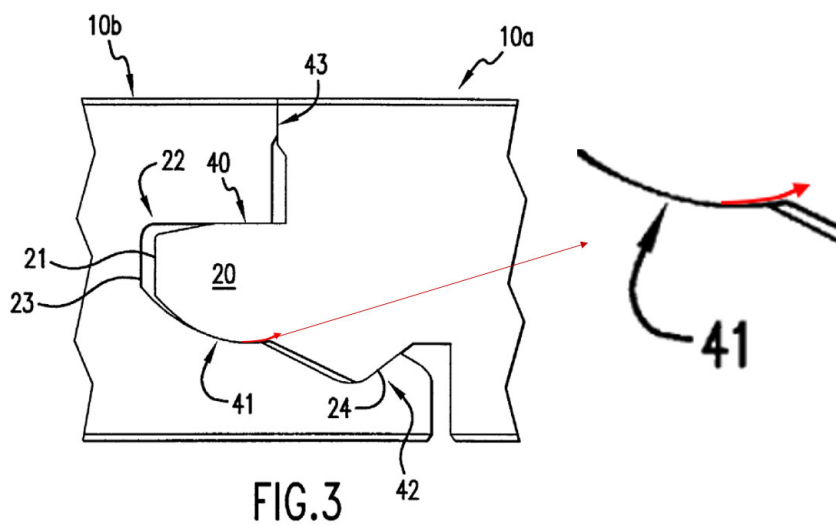
- a. **wherein an intermediate transitional ridge between the first locking lug and the second locking lug is located inside of the entrance opening of the groove, said entrance opening being located in a main vertical joint plane between two joined floor panels.**

As highlighted in the annotated Fig. 3 of Miller provided below, an intermediate transitional ridge is located between the first locking lug and the second locking lug. The intermediate transitional ridge is located inside of the entrance opening of the groove 23.



Annotated FIG. 3 of Miller

The following annotated and blown up portion of FIG. 3 further demonstrates the claimed intermediate ridge:



This is consistent with the explanation of this feature in reference to FIG. 3 in the '425 Patent. *See* Ex. 1001, FIG. 3, 5:49-54 (“As is further shown in FIG. 3, an intermediate transitional ridge 230 is located between the first locking lug 130 and the second locking lug 140 inside of the entrance opening 120 of the groove 50. As illustrated in the figure, the entrance opening 120 is more particularly located in a main vertical joint plane JP between two joined floor panels 1.”)

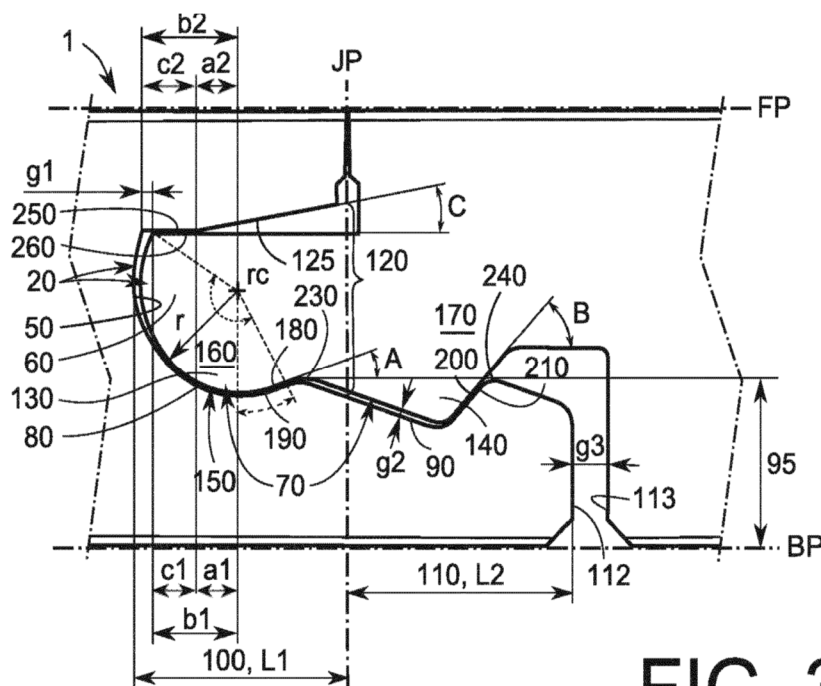


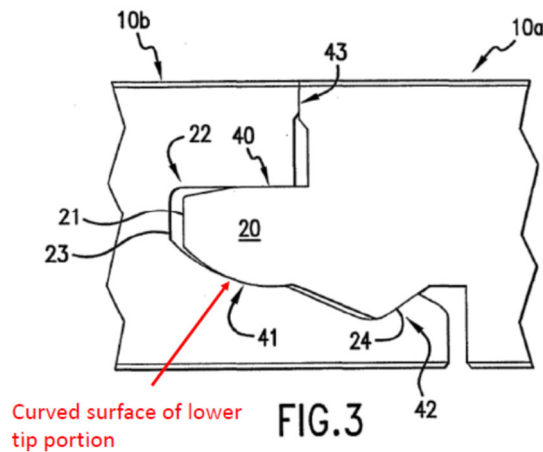
FIG. 3

See also Ex. 1002, Chart 1, pp. 48-50, element 2.

3. Dependent Claim 5

a. **wherein the lower tip portion of the tongue is curved.**

As highlighted in the annotated FIG. 3 of Miller provided below, the lower tip portion of the tongue 20 of the first floor panel 10a is curved.



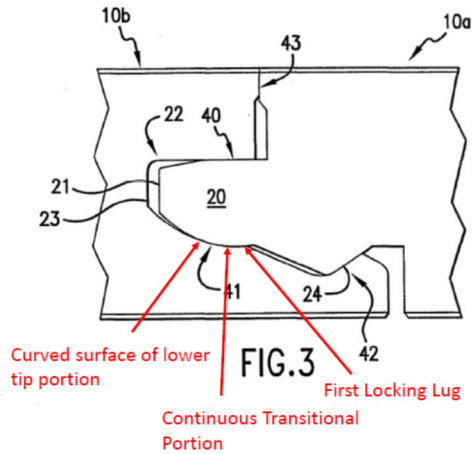
Annotated FIG. 3 of Miller

See also Ex. 1002, Chart 1, p. 57, element 5.

4. Dependent Claim 6

- a. wherein the curvature of the curved lower tip portion of the tongue merges continuously with a corresponding curvature of the horizontal locking surface of the first locking lug.**

As highlighted in the annotated FIG. 3 of Miller provided below, the curvature of the curved lower tip portion of the tongue 20 of the first floor panel 10a merges continuously with a corresponding curvature of the horizontal locking surface of the first locking lug.



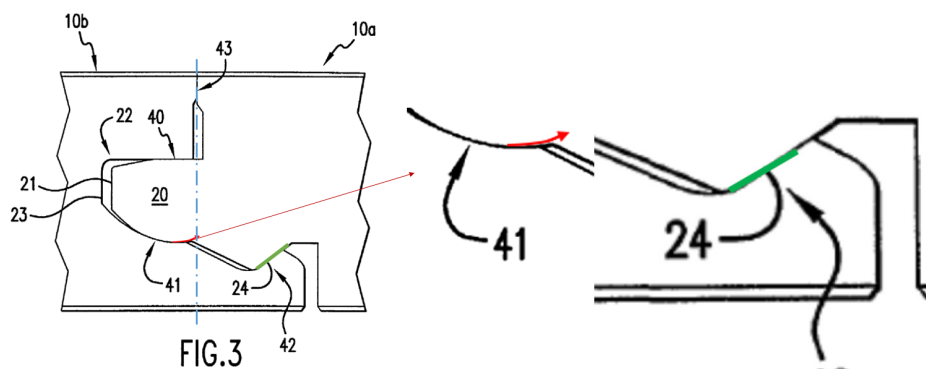
Annotated FIG. 3 of Miller

See also Ex. 1002, Chart 1, p. 58, element 6.

5. Dependent Claim 7

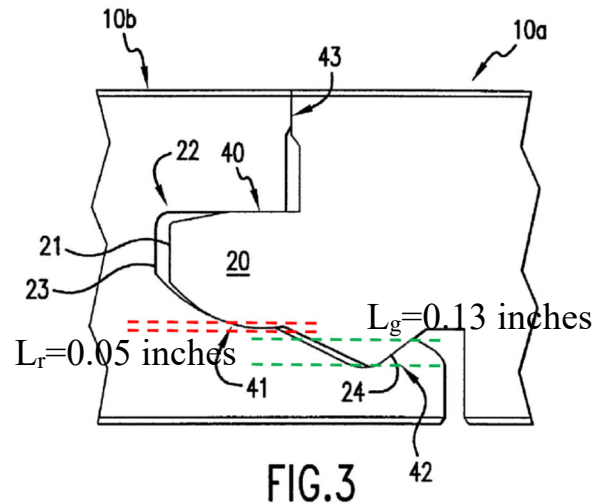
- a. wherein the first locking recess is shallower than the second locking recess.

As highlighted in the two annotated FIG. 3 of Miller provided below, the angle of the red highlighted surface of the first locking recess is shallower than the angle of the green highlighted surface of the second locking recess.



Annotated FIG. 3 of Miller

Measurements of the respective depths of Miller's first and second locking recesses also demonstrate that the first recess is shallower than the second:



Annotated FIG. 3 of Miller

See Ex 1002, Chart 1, pp. 58-59, element 7.

6. Dependent Claim 8

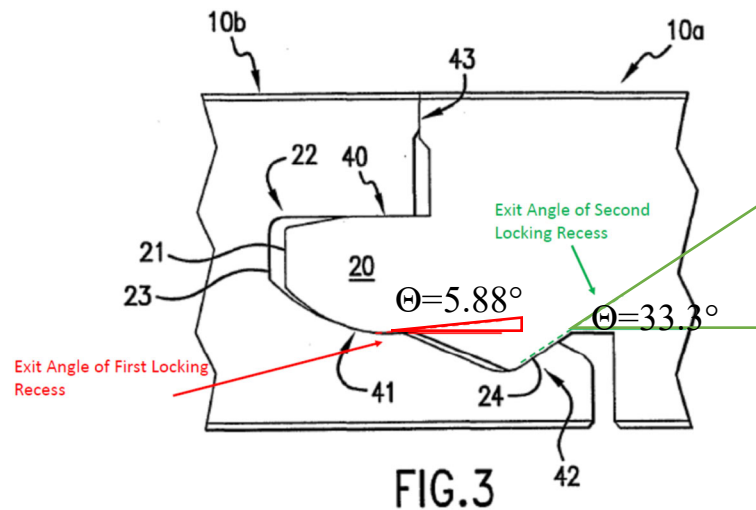
- a. wherein the first locking recess extends downwardly to a depth and the second locking recess extends downwardly to a depth, the depth of the first locking recess is less than half of the depth of the second locking recess.

As demonstrated in the annotated FIG. 3 of Section X.A.5, above, the depth of the first (red) locking recess (L_r) is less than the depth of the second (green) locking recess (L_g). See Ex. 1002, Chart 1, pp. 59-60, element 8.

7. Dependent Claim 9

- a. wherein an exit tangent inclination angle of the curved horizontal locking surface of the first locking recess is less than the inclined locking angle of the second locking recess.

As annotated in FIG. 3 of Miller below, an exit tangent inclination angle of the curved horizontal locking surface of the first locking recess is less than the inclined locking angle of the second locking recess. In the image below the exit tangent inclination angle of the first locking recess is 5.88° , whereas the exit angle of the second locking recess is 33.3° .



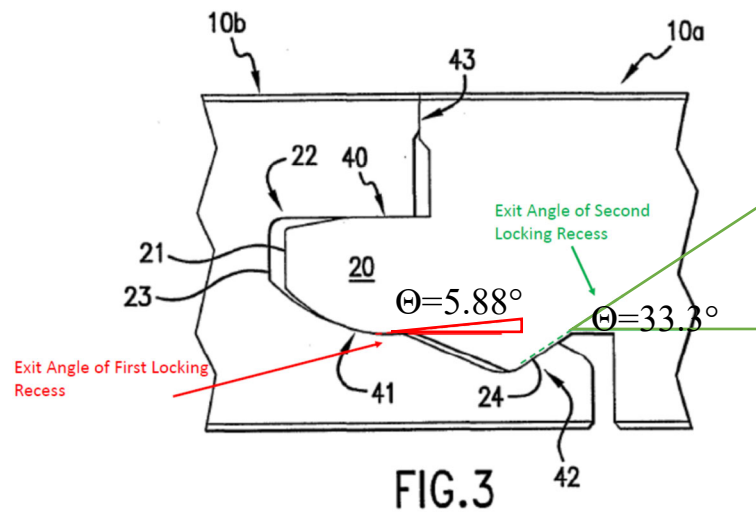
Annotated FIG. 3 of Miller

See Ex. 1002, Chart 1, p. 61, element 9.

8. Dependent Claim 10

- a. wherein said exit tangent inclination angle of the curved horizontal locking surface of the first locking recess is equal to or less than half the inclined locking angle of the second locking recess.

As demonstrated above in Section X.A.7, the curved horizontal locking surface exit tangent inclination angle is 5.88° , which is less than half of the second recess's inclined locking angle, 33.3° . See Ex. 1002, Chart 1, p. 62, element 10.



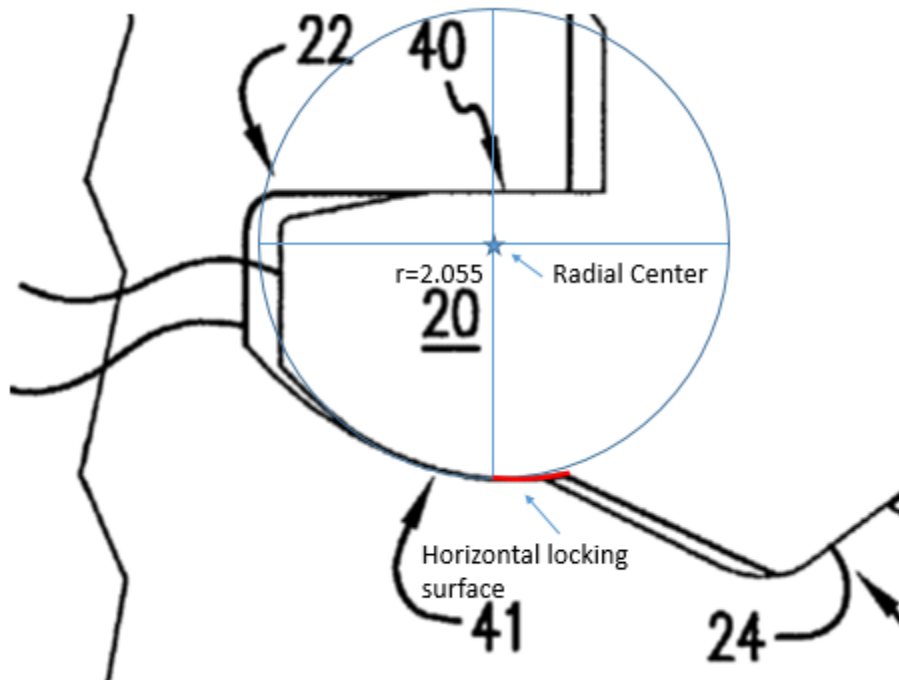
Annotated FIG. 3 of Miller

9. Dependent Claim 11

- a. wherein the curved horizontal locking surface extends from a point located essentially directly below a radial center of the curved first locking recess in a direction towards the second locking recess.

As annotated in FIG. 3 of Miller provided below, the curved horizontal locking surface extends from a point located essentially directly below a radial center

(highlighted with blue star) of the curved first locking recess in a direction towards the second locking recess.



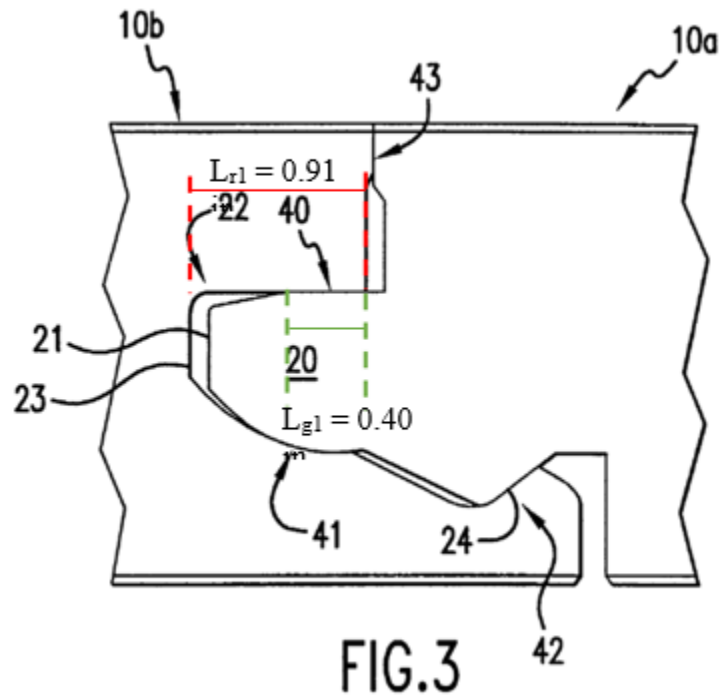
Annotated FIG. 3 of Miller

As shown above, the locking surface (highlighted in red) extends from a position directly below the radial center, which was measured by drawing a circle with arc matching the horizontal locking surface and identifying the intersection point of the horizontal and vertical diameters. See Ex. 1002, Chart 1, p. 63, element 11.

10. Dependent Claim 12

- a. wherein the of tongue includes a vertical locking surface having a length and the groove includes a vertical locking surface having a length, the vertical locking surface of the tongue being less than the length of the vertical locking surface of the groove.

As highlighted in the annotated FIG. 3 of Miller provided below, the tongue 20 of the first floor panel 10a includes the green highlighted vertical locking surface, which is less than the red highlighted vertical locking surface of the groove 23 of the second floor panel 10b. The length of the vertical locking surface of the tongue is represented by $L_{g1}=0.40$ inches whereas, the length of the vertical locking surface of the groove is represented by $L_{r1}= 0.91$ inches. These measurements were taken according to the description of the vertical lock surface measurements as 6:26-31 of the '425 Patent. *See* Ex. 1002, Chart 1, pp. 63-68, element 12; Ex. 1001, FIG. 3.



While L_{r1} and L_{g1} are the measurements as described in the '425 Patent, even taking the entire top surface of the tongue (L_{g2}) to be the length of the vertical locking

surface of the tongue, which is the broadest possible interpretation, it is still less than the length of the vertical locking surface of the groove L_{r2} .

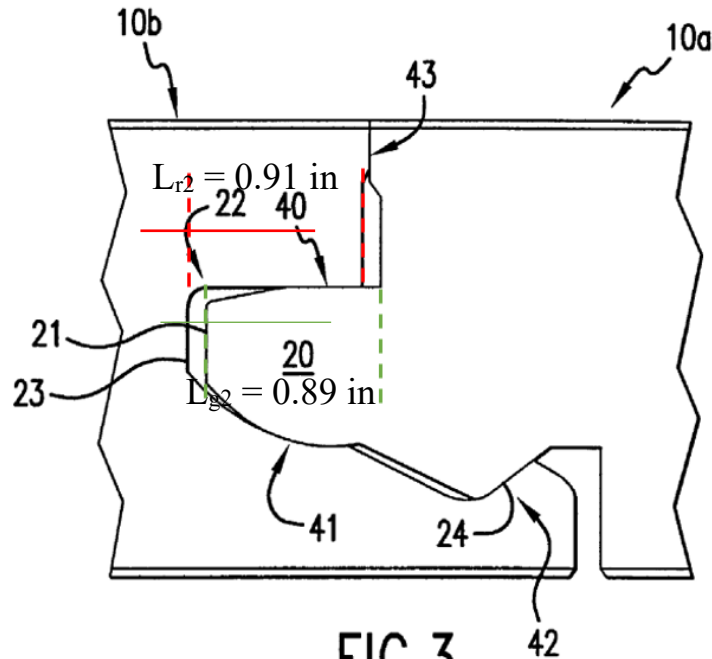


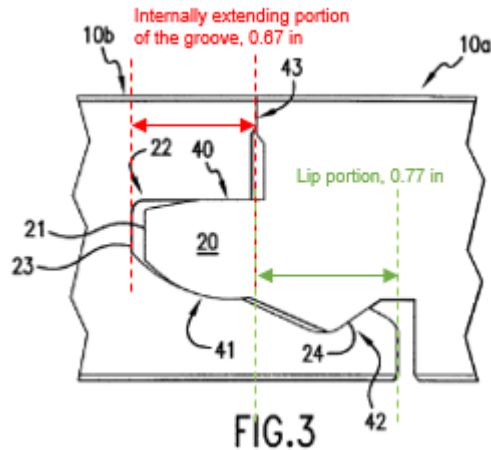
FIG.3

Annotated FIG. 3 of Miller

11. Dependent Claim 15

- a. wherein the length of the internally extending portion within the groove is less than the length of the lip portion protruding from an entrance opening of the groove.

As annotated in FIG. 3 of Miller below, the red highlighted dimension of the internally extending portion of the groove 23 of the second floor panel 10b is less than the green highlighted dimension of the lip portion protruding from the entrance opening of the groove 23 of the second floor panel 10b.



Annotated FIG. 3 of Miller

See Ex. 1002, Chart 1, pp. 76-77, element 15.

B. Ground 2: Claims 1-15 Are Obvious Over Miller

Miller alone renders obvious each and every element of the challenged claims, as discussed below under each heading corresponding to a specific claim element. As discussed above, Miller anticipates each and every element of claims 1-2, 5-12 and 15 of the '425 Patent. To the extent the Board disagrees or the patentee argues otherwise, those claims and additional claims 2-4 and 13-14 would have been obvious over Miller, alone, as discussed below. Those claims and claim elements not addressed below in this Section X.B, are disclosed in Miller for the reasons noted above in Sections X.A.

1. Independent Claim 1

As noted above, Miller teaches each and every element of claim 1. To the extent the Board or the patentee believe that elements [1.4]-[1.9] of the '425 Patent

are not anticipated by Miller, those elements would have been obvious variants of Miller's locking profile to a POSITA over Miller alone.

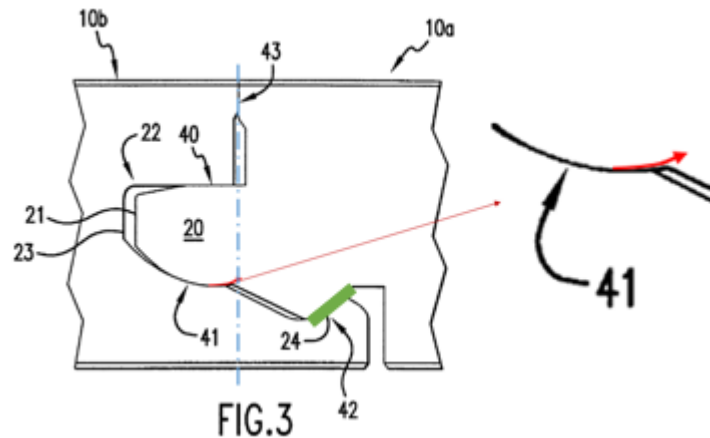
- a. **[1.4] said coupling parts exerting a tension force towards each other in a mutually engaged position, the tension force being achieved by elastic compression of the material of the coupling parts,**

To the extent the Board or the patentee believes Miller does not disclose tension force required by the claims, it would have been obvious to create the locking profiles of Miller without the disclosed adhesive.

Miller incorporates Moriau by reference in its entirety. *See* MPEP § 217 (incorporation by reference under 37 CFR 1.57(b)). Moriau, and thus Miller, discloses an embodiment of a locking profile with the claimed tensioning/locking/compression forces. *See* Ex. 1004, 9:63-10:67; *supra* Section X.A.1.d.

Moriau also suggests that its tensioning/locking/compression force features can be combined with other locking mechanisms. *See* Ex. 1006, 10:17-37; 12:40-44; 13:39-50. Thus, a POSITA would have recognized a suggestion to combine this feature with Miller and a reasonable expectation of success in doing so at the time of the invention of the '425 Patent given Moriau's tensioning features are disclosed as being combinable with other locking mechanisms, including the widely varying profiles of Moriau's other embodiments. *See* Ex. 1002, ¶52.

A POSITA would have been motivated to modify Miller to include Moriau's tensioning force to increase the horizontal locking capabilities of the surfaces highlighted in Miller below, and, thus, the overall locking profile:



Annotated Fig. 3 of Miller

Miller recognizes that locking strength of tension/compression-based locking profiles was a concern in the art well before the earliest effective filing date of the '425 Patent. Ex. 1004, 1:40-59. Additionally, the locking profiles of Miller, FIG. 3 and Moriau, FIG. 23 are strikingly similar. A POSITA would have recognized this similarity, underscoring the reasonable expectation of success in combining Moriau's tensioning features with Miller. See Ex. 1002 at ¶54.

- b. **[1.5] locking means for locking the tongue of the adjoining floor panel within the groove, wherein the locking means comprises dual consecutive locking recesses arranged in a lower portion of the groove, [1.6] a first locking recess located in an internally extending portion within the groove and a second locking recess located in a lip portion protruding from an entrance opening of the groove, [1.7] the**

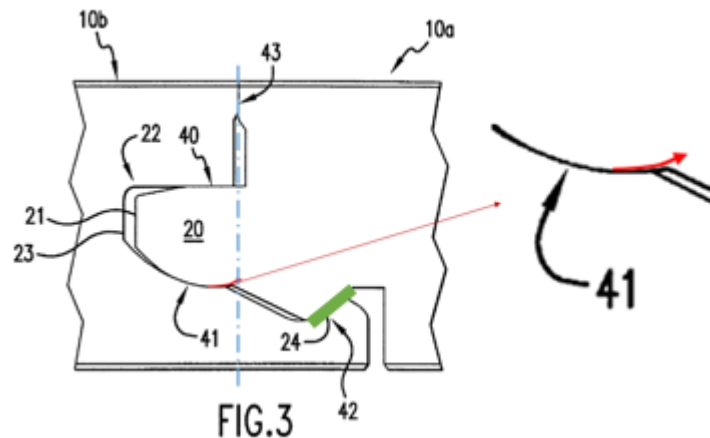
locking means further comprises dual consecutive locking lugs arranged in a lower portion of the tongue for horizontally interlocking engagement in the groove, [1.8] a first locking lug extending downwardly from a lower tip portion of the tongue and a second locking lug extending downwardly from a root portion of the tongue, [1.9] the first locking recess and the first locking lug are provided with matching curved horizontal locking surfaces and the second locking recess and the second locking lug are provided with matching inclined horizontal locking surfaces.

To the extent the Board or the patentee believes that Miller fails to disclose elements [1.5]-[1.9] of the '425 Patent, these features would have been obvious modifications of Miller's locking profile.

Matching curved locking surfaces on the bottom of a tongue and groove profile, such that the tongue includes a locking lug and the groove includes a locking recess, were well known in the art well prior to the invention or priority dates of the '425 Patent. Ex. 1002, ¶¶25-26, 56; Ex. 1006 (FIGS. 2-4, 9 and 10 and associated description); Ex. 1004 (US 7,441,384); Ex. 1006 (US 6,006,486); Ex. 1005 (US 6,216,409); Ex. 1009 (FR2819532); Ex. 1010 (US 2006/0260253); Ex. 1011 (US 6,505,452); Ex. 1012 (CA991373); Ex. 1013 (US 6,591,568); Ex. 1014 (WO 02/055810) Ex. 1005 (Roy). A POSITA would have been aware that using a double locking recess and lug configuration increases the horizontal locking ability and, thus, horizontal locking strength of the locking profile. Ex. 1002, ¶58; Ex. 1005; Ex. 1009.

In the manufacturing of flooring panels, a tongue and groove profile is typically machined out of a piece of core material in a continuous and/or automated manner using tools that remove material from the core material. Ex. 1002, ¶57. An example of a machining (or milling) process is shown in Moriau demonstrating the POSITA's knowledge of such processes. Ex. 1006, FIGS. 12-21; 9:16-57.

Given the above, a POSITA would have recognized that increasing the horizontal locking strength of Miller's first locking recess would simply require machining the bottom of the groove so that the upward curvature of the red highlighted surface below was more drastic or less shallow, and, also machining the tongue to include a matching curvature on its bottom portion. *See* Ex.1002, ¶56.



The dimensions of Miller would only have to be adjusted slightly to make the upward curvature to the right of reference number 41 in FIG. 3, above, slightly more prevalent. Ex. 1002, ¶59. In practice, the locking profiles of flooring panels and their various features, such as locking surfaces, tongues and grooves, are extremely

small. Thus, adjusting the upward curvature of the first locking surface of Miller and the corresponding locking surface on bottom portion of the tongue or “locking lug” to be more prevalent would require very little in terms of machining the locking profile. *Id.* A very small amount of material would need to be machined from Miller’s first locking recess (identified in Sections X.A.1.e-X.A.1.f) and a very small amount of additional material would need to be left on Miller’s first locking lug (identified in Sections X.A.1.g-X.A.1.h), during the milling process. *Id.* These are changes that would have been on the order of fractions of a millimeter, and likely less than a tenth of a millimeter, which would require very little adjustment in the manufacturing process. *Id.* Given that, at the time of the invention of the ’425 Patent, the manufacturing process for these types of panels was well known, that matching curved locking surfaces located at the bottom portions of tongues and grooves, respectively, were well known and easily manufactured, that consecutive double locking recess/locking lug/locking surfaces at the bottom portions of tongues and grooves were well known and known to increase strength of a locking profile, and the required modification of Miller is minimal, a POSITA would have found it obvious to modify the contact surfaces between the tongue and groove to be less shallow and include a more prevalent upward curvature and would had a reasonable expectation of success and doing so. Ex. 1002, ¶60. Accordingly, claim 1 is obvious over Miller.

2. Dependent Claim 3

- a. wherein an intermediate transitional ridge between the first locking lug and the second locking lug is aligned with the entrance opening of the groove, said entrance opening being located in a main vertical joint plane between two joined panels.

This feature would have been a matter of obvious design choice, and therefore, would have been obvious to a POSITA at the time of the claimed invention was made. The '425 Patent includes a single example wherein the intermediate transitional ridge between the first locking lug and the second locking lug is “aligned with the entrance opening of the groove.” No importance or criticality is attributed to the feature that the intermediate transitional ridge is aligned with the entrance opening of the groove. The entirety of the description concerning this embodiment is found at column 7, lines 9-19 and FIG. 8:

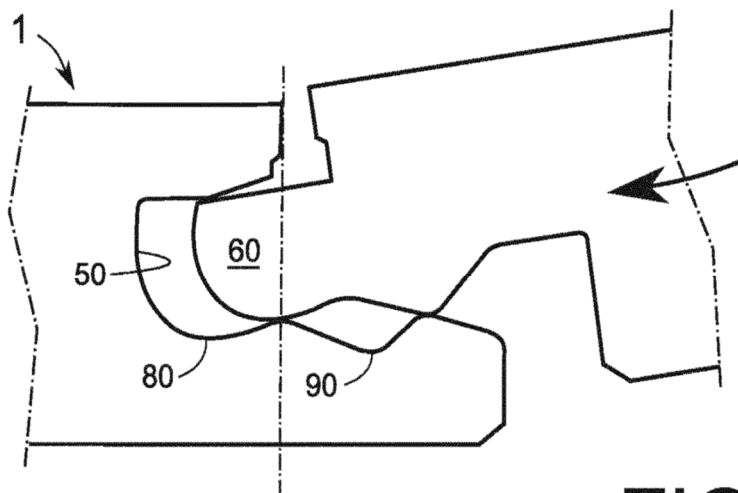


FIG. 8

Merely, shifting the location of this intermediate ridge in the horizontal direction from just inside the entrance opening to aligned with the entrance opening, and, thus, the joint plane, will have no appreciable effect on the locking ability or strength of the construction, provided the tongue and groove are machined in a complementary manner, which is necessary to achieve locking of adjacent floor panels due at least in part to the fact that in practice this change would be an incredibly small change in position of the respective elements. Ex 1002, Chart 1, pp. 50-53, element 3. This conclusion is consistent with the '425 Patent ascribing no criticality, importance or benefit to this feature. Ex. 1001 at 7:9-19, FIG. 8.

As such, putting the ridge in line with the entrance opening or inside of it is, simply a matter of design preference.

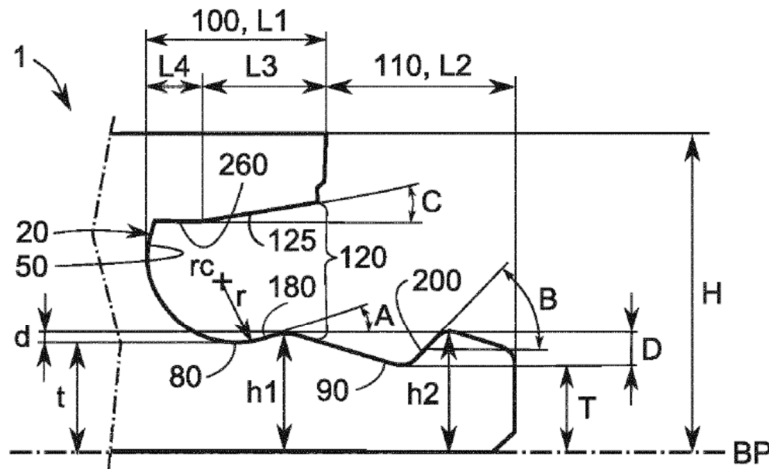
A POSITA would have recognized a reasonable expectation of success in modifying Miller to move the intermediate transitional ridge slightly from just inside the entrance opening of the groove to being aligned with it. In practice, today and at the time of the invention of '425 Patent, a POSITA would simply have to have made sure the corresponding locking profiles on a first and second floorboard were shaped in a way to be complementary to each other, which would have very much been within the level of skill of a POSITA at the time of the invention of the '425 Patent. Ex. 1002, Chart 1, pp. 50-53, element 3; Exs. 1004-1014 (demonstrating complimentary locking mechanisms); Ex. 1006 (explaining a typical machining

process for locking profiles; Ex. 1005 (same and demonstrating complementary dual consecutive locking lugs and recesses, wherein the “intermediate transitional ridge” height is equal to or less than “inlet ridge” height of the second locking recess). Accordingly, claim 3 is obvious over Miller.

3. Dependent Claim 4

- a. **The joining system for floor panels according to claim 3, the intermediate transitional ridge having a height measured from a bottom plane of the floor panel and a corresponding inlet ridge of the second locking recess having a height, the height of the intermediate transitional ridge being equal to or less than the height of an inlet ridge of the second locking recess.**

This feature would have been a matter of obvious design choice, and therefore, would have been obvious to a POSITA at the time of the claimed invention as made. The '425 Patent includes a single example wherein the intermediate transitional ridge has a height that is equal to or less than the height of the inlet ridge of the second locking recess. The entirety of the description concerning this embodiment is found at column 6, lines 32-48 with reference to FIG. 4:



This disclosure and the '425 Patent in general does not attribute any importance or criticality to the feature that the intermediate transitional ridge is aligned with the entrance opening of the groove.

If any effect exists, it is negligible. Ex. 1002, Chart 1, pp. 53-56, element 4. Adjusting the heights in accordance with this claim would not have any significant effect on the system's locking characteristics or performance. A POSITA would simply have to have made sure the corresponding locking lugs were shaped in a way to be complementary to the resulting locking recesses, which would have been within the level of skill of a POSITA since this is a basic requirement of a locking profile. *Id.*; Exs. 1004-1014 (demonstrating complimentary locking mechanisms); Ex. 1006 (explaining a typical machining process for locking profiles; Ex. 1005 (showing same and demonstrating complementary dual consecutive locking lugs and

locking recesses, including wherein the “intermediate transitional ridge” has a height equal to or less than that of “inlet ridge” of the second locking recess). Accordingly, a POSITA would have recognized a reasonable expectation of success in doing so.

Additionally, these locking profiles are exceedingly small. Changing the position of certain elements, even for more dramatic changes, results in a change of position that is often, and at most, just a few tenths of a millimeter. Thus, a change of height of either the intermediate transitional ridge or inlet ridge of the second locking recess of Miller such that the intermediate transitional ridge of Miller would have a height equal to that of the second recess inlet ridge would have been merely a few hundredths of a millimeter. Manufacturing tolerances are typically set to be a tenth of a millimeter or less. Ex. 1002, Chart 1, pp. 53-56, element 4; Ex. 1015, 12:13-18 (noting “modern” manufacturing tolerances of ± 0.01 mm and ± 0.1 mm). Thus, changing the heights of the ridges as described in Claim 4, would have been within the manufacturing tolerances of the manufacturing equipment. Any changes to the locking ability or function of the system would have been insignificant and unnoticeable at the time of the invention of the '425 Patent. Ex. 1002, ¶59, Chart 1, pp. 53-56, element 4. For these reasons, claim 4 would have been obvious over Miller.

4. Dependent Claim 13

- a. **wherein a minimum thickness between the first locking recess and a bottom plane of the floor panel exceeds a third of the total height of the floor panel.**

This feature is a matter of obvious design choice, and therefore, would have been obvious to a POSITA at the time of the claimed invention as made. The '425 Patent explains:

The minimum thickness t between the first locking recess 80 and a bottom plane BP of the of the floor panel 1 exceeds a third of the total height H of the floor panel 1.

Ex. 1001, 6:45-48. This is the entirety of the '425 Patent's discussion of the minimum thickness between the first locking recess and a bottom plane of the floor panel exceeding a third of the total height of the floor panel. As such, the '425 Patent does not attribute any importance or criticality to this feature. To the extent that the patentee argues that the language in the '425 Patent describing that "[a] thicker and more robust lower portion of the groove] is important for floor panels made of inherently brittle and less dense materials" demonstrates the criticality of the claim 13 features, the benefits of thickness were well known in the art at the time of the invention. Both Miller and Moriau (which is incorporated by reference in Miller) acknowledge material thickness means improved strength or stability. Ex. 1004, 3:44-47 ("Additionally, the backing layer 16 may improve the structural integrity of the floor panel 10 by increasing overall thickness and reducing the warp and wear tendencies of the uncoated core material."); Ex. 1006, 8:28-37 ("In order to allow

for a smooth assembly, to guarantee the necessary stability and firmness and in order to limit the quantity of material to be cut away, the difference E between the distally outer edge of the upper lip 22-42 and the distally outer edge of the lower lip 23-43, measured in the plane of the floor panel and perpendicular to the longitudinal direction of the groove 10, should preferably be kept smaller than one time the total thickness F of the floor panel 1. For stability's sake, normally this total thickness F shall never be less than 5 mm.”); *see also* Ex. 1002, Chart 1, pp. 68-71, element 13 (explaining that the figures of the '425 Patent do not demonstrate this feature).

Moreover, the minimum thickness between the first locking recess and a bottom plane of the floor panel exceeding a third of the total height of the floor panel is merely a design choice. The effects caused by adjusting the ratio of height of locking recess to total height are negligible if any. *Id.* However, even if there was an effect on the functionality a POSITA would have been skilled enough to adjust the ratio in such a way as to achieve effective locking of the panels and/or make the locking profile stronger. *Id.*

For the above reasons, claim 13 would have been obvious over Miller.

5. Dependent Claim 14

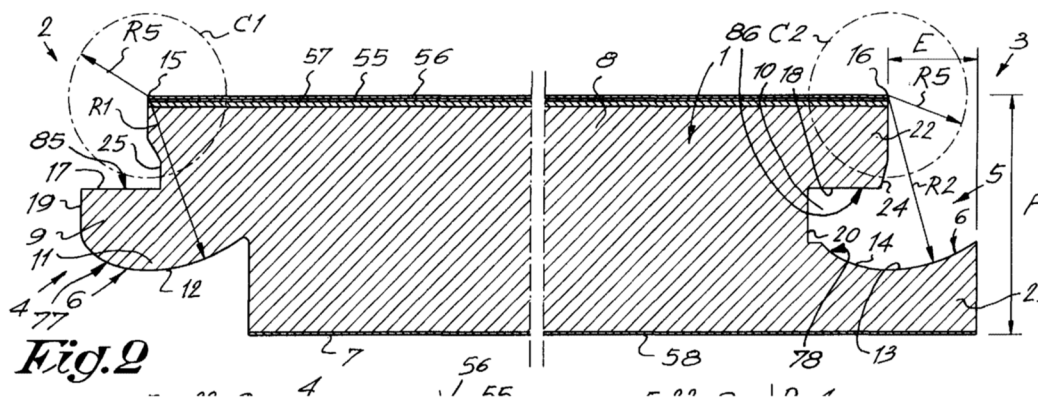
a. **Dependent Claim 14**

This feature would have been an obvious modification of the primary embodiment (FIGS. 2-3) of Miller in view of the embodiments of FIGS. 2-4 of

Moriau (Ex. 1006), which is incorporated by reference into Miller and, thus, part of Miller's disclosure.

Miller (through Moriau's incorporation by reference) and the '425 Patent both disclose a chamfer at the entrance opening of the groove to make introduction of the tongue into the groove and connection of adjacent floor panels easier.

Moriau notes that “a *chamfer 24* and lip 22 and a recess 25 can be provided, as represented in FIGS. 2 to 4, as a result of which the subsequent floor panels 1 can easily be pushed and guided into each other, such that no possible ridges in the subflooring or such render good insertion difficult.” Ex. 1006, 6:29-35 (emphasis added); *id.*, FIGS. 2-4.



As shown above in FIG. 2 of Moriau, a chamfer 24 is located at the entrance opening of the groove.

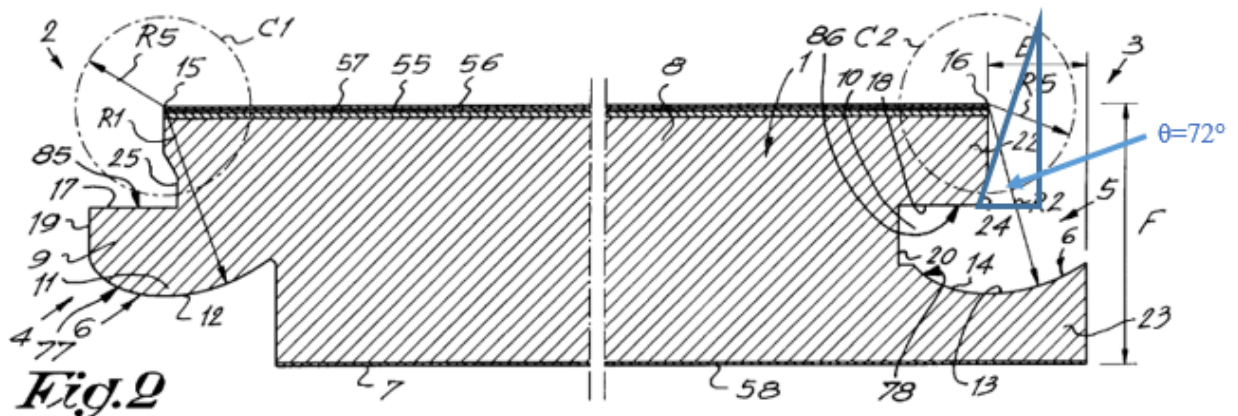
The '425 Patent discloses that “[i]n order to ensure an easy access for the tongue during the joining procedure, the introduction angle C of the groove 50 is equal to or greater than 10 degrees. Said *introduction angle C* is defined as the

3.” Ex. 1001, 5:61-65 (emphasis added); *id.* at FIG. 3.



As shown in the below annotated FIG. 2 of Moriau, the angle of the chamfer and thus the introduction angle of the groove is 72°, which is of course greater than 10°. It would have been obvious to a POSITA to include this introduction angle in the FIG. 3 embodiment of Miller given Moriau is a part of the disclosure of Miller, and Moriau notes that the chamfer, which creates the introduction angle (*see* Ex.

1001, 5:61-65) makes engagement of adjacent floor panels (and thus of the tongue and groove) easier. Ex. 1002, Chart 1, pp. 71-76, element 14. For at least these reasons, a POSITA would have recognized a suggestion and been motivated to modify FIGS. 2-3 of Miller to have an introduction angle of greater than 10°.



Annotated Fig. 2 of Moriau

The POSITA also would have recognized a reasonable expectation of success given that such introduction angles were already known in the art. Moreover, both Moriau and Miller disclose that their disclosures can be combined with other locking profiles. See Ex. 1004, 5:45-57 (“It should also be noted that the embodiments shown in FIGS. 2 and 3 are for illustrative purposes only, and that the present invention is equally applicable to other coupling profiles known in the industry or that may be developed in the future. In other embodiments, the quantity, size and location of the contact zones may vary with the profile as desired, but the different profiles still fall within the scope of the present invention. For example, a tongue

and groove profile without a locking structure would benefit from, and fall within the scope of the present invention. As a further example, a tongue and groove profile in which substantially full contact is maintained along the entire mating edges of the panels is also contemplated as being within the scope of the invention.”); Ex. 1006, 10:17-37; *id.* at 12:40-44; *id.* at 13:39-50; Ex. 1002, Chart 1, pp. 71-76, element 14.

For the above reasons, the features of claim 14 would have been an obvious modification of Miller, FIGS. 2-3.

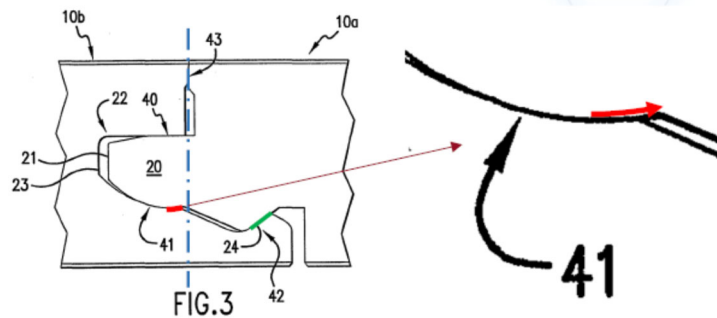
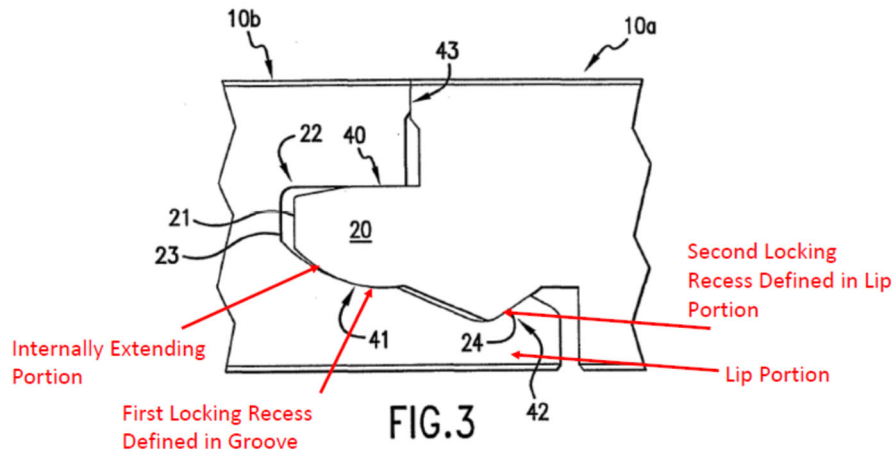
C. Ground 3: Claims 1, 2, 4-12, 14, and 15 Are Obvious Over Miller in View of Roy

As discussed above, Miller, alone teaches and/or renders obvious each and every element of the challenged claims. To the extent the Board or the patentee believe that elements [1.5]-[1.6] and [1.9] of the '425 Patent are not disclosed by Miller, those elements would have been obvious variants of Miller's locking profile over Miller in view of Roy. Likewise, to the extent the Board or the patentee disagrees that Miller alone renders claims 4 and 14 obvious, those claims also would have been obvious over Miller in view of Roy. Those claims and claim elements not addressed below in this Section X.C, are disclosed in or rendered obvious by Miller for the reasons noted above in Sections X.A and X.B.

1. Independent Claim 1

- a. **[1.5] locking means for locking the tongue of the adjoining floor panel within the groove, wherein the locking means comprises dual consecutive locking recesses arranged in a lower portion of the groove, [1.6] a first locking recess located in an internally extending portion within the groove and a second locking recess located in a lip portion protruding from an entrance opening of the groove, [1.7] the locking means further comprises dual consecutive locking lugs arranged in a lower portion of the tongue for horizontally interlocking engagement in the groove, [1.8] a first locking lug extending downwardly from a lower tip portion of the tongue and a second locking lug extending downwardly from a root portion of the tongue, [1.9] the first locking recess and the first locking lug are provided with matching curved horizontal locking surfaces and the second locking recess and the second locking lug are provided with matching inclined horizontal locking surfaces.**

Miller discloses a first locking recess and first locking lug with matching curving locking surfaces as indicated above in Sections X.A.1.e-X.A.1.i. Miller discloses “[t]he protrusion 21 of panel 10*a* contacts the upper lip 33 and the lower lip 31 of panel 10*b* at zones 40 and 41, respectively. Contact zones 40 and 41 help locate the panels into substantially the same horizontal plane. The rib 30 (Fig. 2) of panel 10*a* engages the detent 32 of panel 10*b* at contact zone 42. In this embodiment, the contact zone 42 is substantially planar; however, any contact zone may be formed in any shape depending on the profile desired.” Ex. 1004, 5:15-23. The claimed features are further highlighted in the two annotated Fig. 3 of Miller provided below.



To the extent the Board disagrees, however, these features are also disclosed in Roy. Roy discloses that “[i]n cross section the tongue 4 has, starting from its free end 10 and on its bottom face 11, a substantially circular first section 12 followed by a downwardly projecting raised portion 13. The bottom lip 7 has on its top face 14, starting from the back 15 of the groove 5, a first section 16 on which the first section 12 of the tongue 4 rolls and slides followed by a recess 17 complementary to the raised portion 13 of the tongue 4 followed by a bead 18 delimiting the recess 17.” Ex. 1005, 3:23-31. Roy further notes that “the tongue 4 has on its bottom face 11 and the bottom lip 7 of the groove 5 has on its top face 14, respectively, a second

raised portion 20 projecting downward in the direction D_2 and a complementary second recess 21 shaped so that the second raised portion 20 of the tongue 4 of a panel 1 interengages with the second recess 21 of the groove 5 of an adjacent panel when one panel 1 is turned relative to the other, so as to form a second means of clipping the tongue 4 into the groove 5.” Ex. 1005, 3:37-46.

Roy further notes that “the second recess 21 on the top face 14 of the bottom lip 7 is between the section 16, which is parallel to the main faces 8, 9 of the panel 1, and the first recess 17.” Ex. 1005, 3:53-55.

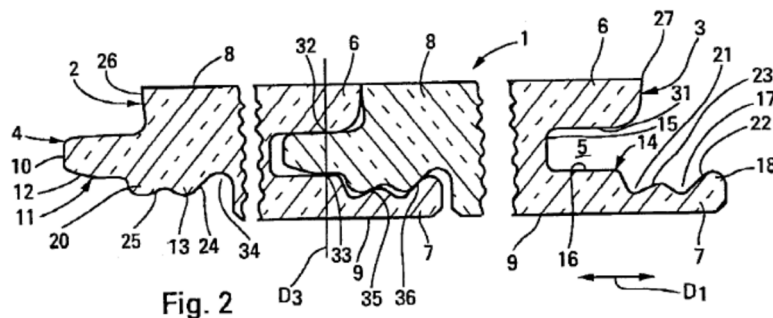
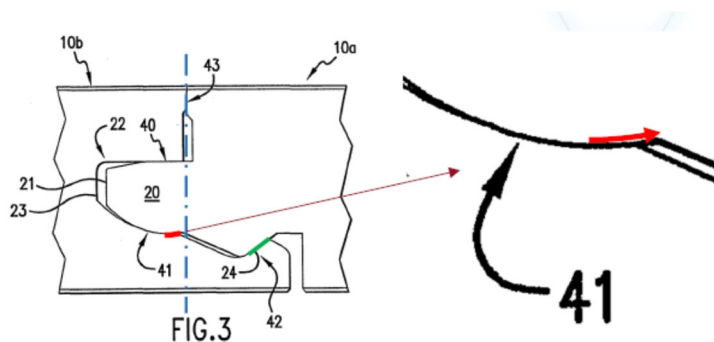


Fig. 2 of Roy

Accordingly, Roy discloses the use of dual consecutive locking recess and lug pairs.

Miller and Roy both recognize increasing locking strength was a concern at the time of Miller’s publication (October 2008), well before the earliest effective filing date of the ’425 Patent. Roy, like Miller, is a “tongue and groove”-style rotational or angular locking mechanism. *See* Ex. 1004 at 5:4-12; Ex. 1005 at 2:59-67; Ex. 1002, Chart 2, pp. 84-87, element 1.5. Roy discloses that its double locking

recess/locking lug configuration increases horizontal locking strength. Ex. 1005, 1:66-2:24. Thus, a POSITA would have been motivated to modify Miller to increase the horizontal locking ability of the surfaces highlighted above in red, below, to create a more pronounced curvature and less shallow recess (with matching lug on the bottom of the tongue) to increase the horizontal locking ability:



Ex. 1002, Chart 2, pp. 89-91, element 1.9.

It would have been obvious to one of skill in the art at the time of invention to make this modification of Miller because a POSITA would have recognized the similarity in Roy and Miller, that horizontal locking strength was a concern at the time, that Roy's dual locking recess/lug configuration was known to increase horizontal locking strength, that matching curved locking surfaces on the bottom of a tongue and groove were ubiquitous at the relevant time, and that adjusting locking mechanisms is not complex. Ex. 1002, ¶¶58-59, 63-62. A POSITA would have recognized a reasonable expectation of success in modifying Miller's first locking recess to be more shallow with a more prevalent curvature and modifying Miller's tongue to match since the POSITA would have recognized the modifications need

be only very slight. *Id.* at ¶59. The dimensions of Miller's tongue and groove would only have to be adjusted by mere fractions of millimeter because, in practice, the locking systems at issue are exceedingly small. *Id.* Making the upward curvature of the first locking recess and locking surface of Miller more prevalent would require very little additional material to be removed. *Id.* Likewise, making a complementary tongue and locking lug to match the groove and locking recess modification would require very little additional material to be present on Miller's tongue and first locking lug. *Id.*

Lastly, Miller also provides additional motivation to combine its teachings with other references:

It should also be noted that the embodiments shown in FIGS. 2 and 3 are for illustrative purposes only, and that the present invention is equally applicable to other coupling profiles known in the industry or that may be developed in the future. In other embodiments, the quantity, size and location of the contact zones may vary with the profile as desired, but the different profiles still fall within the scope of the present invention. For example, a tongue and groove profile without a locking structure would benefit from, and fall within the scope of the present invention. As a further example, a tongue and groove profile in which substantially full contact is maintained along the entire mating edges of the panels is also contemplated as being within the scope of the invention.

Ex. 1004, 5:45-57.

For at least the above reasons, it would have been obvious, in view of Roy, to modify Miller's first locking recess to be less shallow and have a more prevalent

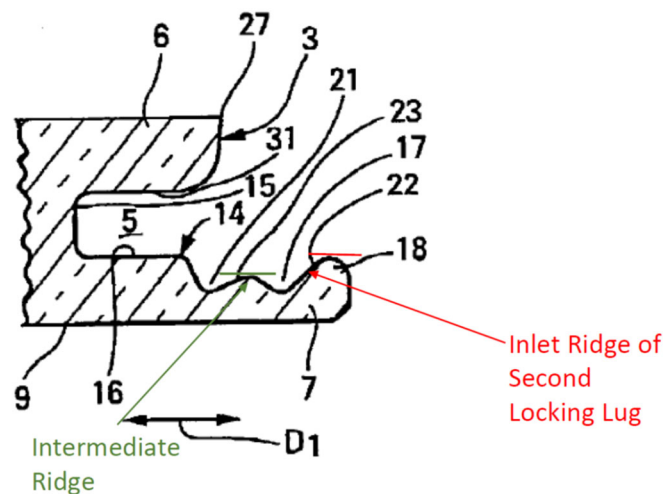
upward curvature and to modify Miller's first locking lug to match that curvature.

Accordingly, claim 1 is obvious over Miller, in view of Roy.

2. Dependent Claim 4

- a. **the intermediate transitional ridge having a height measured from a bottom plane of the floor panel and a corresponding inlet ridge of the second locking recess having a height, the height of the intermediate transitional ridge being equal to or less than the height of an inlet ridge of the second locking recess.**

To the extent the Board determines that claim 4 is not obvious over Miller alone, claim 4 also would have been obvious over Miller in view of Roy. As annotated in FIG. 2 of Roy below, the height of the intermediate ridge, shown in green, is less than the height of inlet ridge of the second locking lug, highlighted in red.



Annotated Portion of FIG. 2 of Roy

As noted above in Section X.C.1.a, both Miller and Roy recognize the importance of increasing locking strength, Roy's double locking recess/locking lug arrangement is disclosed as increasing horizontal locking strength, and Roy and Miller are both "tongue and groove" style locking mechanisms that can be engaged using a rotational or angular movement of one floor panel with respect to another. *See* Ex. 1004, 5:4-12; Ex. 1005, 2:59-67; Ex. 1002, ¶¶54, 58, Chart 2, pp. 99-103, element 4. A POSITA would have recognized this similarity and a reasonable expectation of success in combining the teachings of Roy and Miller for the reasons expressed above in Section X.C.1.a and for the further reasons that both Roy and Miller (through its incorporation by reference of Moriau) disclose how their respective locking mechanisms are machined or milled, and their machining processes are themselves very similar. *See* Ex. 1002, ¶57, Chart 2, pp. 99-103, element 4; Ex. 1006, 9:16-57, FIGS. 12-21; Ex. 1005, 3:53-4:2 (disclosing another milling process).

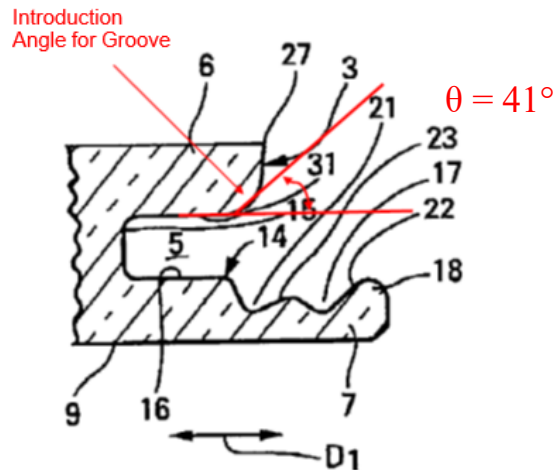
Accordingly, claim 4 is obvious over Miller in view of Roy.

3. Dependent Claim 14

- a. **wherein the groove includes an introduction angle, the introduction angle of the groove being equal to or greater than 10 degrees.**

To the extent the Board determines that claim 14 is not obvious over Miller alone, claim 14 also would have been obvious over Miller in view of Roy. The

introduction angle for groove 5 highlighted in the annotated Fig. 2 of Roy provided below is equal to or greater than 10°. In the below figure the angle is 41°. Ex. 1002, Chart 2, pp. 121-26, element 14.



Annotated Portion of FIG. 2 of Roy

While the introduction angle of Roy is aided by the use of a fillet rather than a chamfer, this fillet is functionally equivalent to the chamfer of the '425 Patent since it is used for the same purpose of positioning the adjacent panel for rotational locking movement. Ex. 1002, Chart 2, pp. 121-26, element 14. Further the chamfer is not a claimed element of claim 14 only the introduction angle is recited. The 41° introduction angle of Roy is clearly greater than the 10° claimed.

Fig. 3 of Roy shows the panel introduced and the tongue staying in contact with the fillet throughout insertion and clearly shows the tongue-side panel (and thus the tongue) being rotated down toward the groove from angles greater than ten even to the naked eye. For example, the line indicated at reference number 1 in Fig. 3 of

Roy, which represents the top surface of a floor panel, is clearly at an angle greater than 10° :

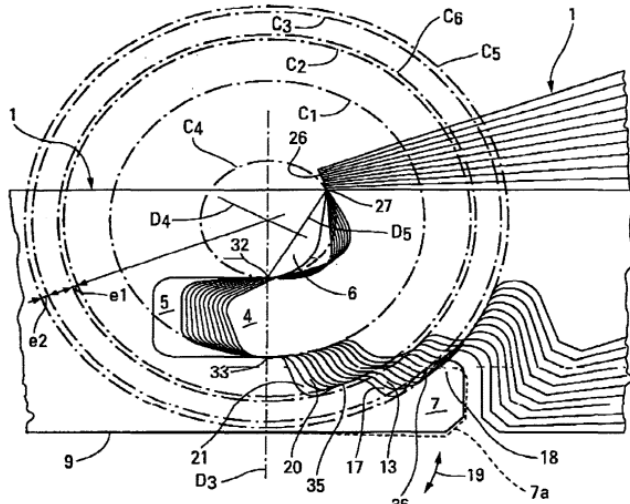


Fig. 3

Ex. 1002, Chart 2, pp. 121-26, element 14.

For these reasons, and for the reasons for combining Miller and Roy expressed above in Sections X.C.1.- X.C.2, it would have been obvious to a POSITA at the time of invention of the '425 Patent to combine the embodiments of Miller with the introduction angle taught by Roy to achieve the features of claim 14.

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XI. CONCLUSION

For the foregoing reasons, Petitioners respectfully request institution of an *inter partes* review, and cancellation of claims 1-15 of the '425 Patent.

Respectfully submitted,

THE WEBB LAW FIRM

Dated: February 21, 2024

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, Petitioner hereby certifies, in accordance with and in reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this Petition is 10,765 (including 10,483 words in the body of the text and 282 words in figure annotations). Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify, that on February 21, 2024, pursuant to 37 C.F.R. sections 42.6 and 42.105, I served a complete copy of the Petition for *Inter Partes* Review of U.S. Patent No. 11,421,425 and Exhibits 1001 through 1025, via FedEx Express, upon the patent prosecution counsel of record for the Patent Owner:

Seth Natter
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Respectfully submitted,

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