

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PRIMESOURCE BUILDING PRODUCTS, INC.
Petitioner

v.

NATIONAL NAIL, CORP.
Patent Owner

Case No. IPR2024-01100
U.S. Patent No. 10,378,218

DECLARATION OF DR. RICHARD W. KLOPP, Ph.D., P.E., F.A.S.M.E.

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LIST OF EXHIBITS

Exhibit #	Description
EX. 1001	U.S. Patent No. 10,378,218 (the “218 Patent”)
EX. 1002	File History of U.S. Patent No. 10,378,218
EX. 1003	Declaration of Dr. Richard W. Klopp, Ph.D., P.E., F.A.S.M.E. (“Dr. Klopp”)
EX. 1004	Unexamined Patent Application Publication No. JP-2016-61061 with attached certified English-language translation (“ <i>Kitaura</i> ”)
EX. 1005	Curriculum Vitae of Dr. Klopp
EX. 1006	United States Patent Application Publication No. US2015/0354204 (“ <i>Kinnunen</i> ”)
EX. 1007	Claim Listing
EX. 1008	Docket Report for <i>National Nail Corp. v. PrimeSource Building Products Inc.</i> , 3-23-cv-02746 (NDTX) (Dec. 12, 2023)
EX. 1009	Interim Guidance from PTAB
EX. 1010	Infringement Contentions served by Patent Owner in <i>National Nail Corp. v. PrimeSource Building Products Inc.</i> , 3-23-cv-02746 (NDTX) (Dec. 12, 2023)
EX. 1011	Unexamined Patent Application Publication No. JP-2011-236601 with attached certified English-language translation (“ <i>Kitaura '601</i> ”)
EX. 1012	Case List for Dr. Klopp
EX. 1013	Scheduling Order for <i>National Nail Corp. v. PrimeSource Building Products Inc.</i> , 3-23-cv-02746 (NDTX) (Dec. 12, 2023)
EX. 1014	Excerpt of Archived Webpage for Trex Hidden Deck Fasteners available at: https://web.archive.org/web/20160303100406/http://www.trex.com/products/accessory-hardware (“Trex Website Background Reference”) (last accessed 7/2/2024).

I, Richard W. Klopp, declare as follows:

I. ENGAGEMENT

1. I have been retained by counsel for Petitioner (PrimeSource Building Products, Inc.) as an expert witness in an *inter partes* review (“IPR”) before the U.S. Patent Trial and Appeal Board (“PTAB”). I have been asked to provide my opinions on whether a person of ordinary skill in the art (“POSITA”) would have found that Claim 17 (the “Challenged Claim”) of U.S. Patent No. 10,378,218 (“the ’218 patent,”) (EX. 1001) was anticipated by prior art or¹ obvious in view of prior art and/or background knowledge of a POSITA at the time of the patent’s earliest claimed priority date. In performing this analysis, I have assumed that the priority date is the date of the earliest provisional application in the chain leading to the ’218 patent: August 15, 2017. I take no position at this time whether that is the correct priority date and understand that later dates could apply. My opinions are set forth below.

2. My employer, Exponent, is being compensated by Patent Owner at the rate of \$695 per hour, which is Exponent’s standard hourly consulting rate for my time spent on this matter. This compensation is not contingent on my performance,

¹ In this Declaration, “or” means logical OR, and not exclusive or (XOR).

my opinions, the outcome of this matter, or any other issues involved in or related to this matter. Neither Exponent nor I have a conflict of interest with respect to the Petitioner or Patent Owner.

3. I am over 18 years of age, I have personal knowledge of the facts stated in this declaration, and I could testify competently to them if asked to do so.

II. QUALIFICATIONS

4. A copy of my curriculum vitae is submitted as EX. 1005. This curriculum vitae lists publications I have authored over the past ten years. A list of all other cases in which I have testified as an expert during the last four years at trial or by deposition is attached as EX. 1012.

5. Exponent is the world's largest engineering and scientific consulting firm dedicated to solving technology problems of all kinds. Exponent provides both proactive services aimed at preventing problems, as well as reactive services for investigating and understanding problems that have occurred. With more than 900 employees, including more than 500 with Ph.Ds., having expertise in dozens of engineering and scientific disciplines, located in more than 30 offices around the world, Exponent is able to assemble project teams with the appropriate expertise for any given problem. Exponent has investigated nearly every high-profile failure or disaster of the past several decades, including the World Trade Center collapse in

New York City, the Miller Park crane collapse in Milwaukee, Wisconsin, Boston's Big Dig, and Seattle's SR99 Tunnel.

6. I am a Principal Engineer based in Exponent's Menlo Park, California, office. I am a trained mechanical engineer holding professional engineer licenses in the states of California, Texas, Washington, Michigan, and Nevada. I received my undergraduate Bachelor of Science degree in mechanical engineering from Lehigh University; two Master of Science degrees, in engineering and applied mathematics, from Brown University; and a Ph.D. in engineering, also from Brown University. I currently mentor the local high school robotics team, teaching them aspects of mechanical engineering design, metal fabrication, and machine shop practice. I am also a Fellow of the American Society of Mechanical Engineers and have been practicing in the field of mechanical engineering for more than 40 years. I have specific expertise and regularly provide consulting services in mechanical engineering and mechanics, including product design, machine design, solid mechanics, failure analysis, fracture mechanics, and experimental mechanics.

7. I have been immersed my whole life in the area of mechanical engineering design, and I am also a skilled machinist and precision tool enthusiast. My failure analysis work has often involved connections used in the construction trades, screws, and deformable elements, all of which are relevant to the deck

fastener technology at issue. I have extensive personal experience with woodworking extending back decades, including fastening and joining of furniture I built from scratch while I was in graduate school, house framing with my father in my pre-teen years, and outdoor decking, stairs, and railing repairs at a ski cabin my wife owned from 1996 to approximately 2001. My experience with threaded fasteners extends from simple wood screws to highly engineered precision bolts for aerospace applications. I have personally machined many metal and plastic fastening components for test apparatus as part of my work, as well as my hobbies.

8. Much of my current work relates directly to commercial disputes. The remainder is split between reactive failure analyses and proactive (non-litigation) engineering work supporting, specifically, product design, product improvement, and the prevention of failures. I have provided written analysis and oral testimony in a wide variety of intellectual property matters, including patent infringement and invalidity analyses, trade secret misappropriation, design patent and trade dress functionality, and technology licensing disputes. Venues have included state and U.S. District courts, the U.S. International Trade Commission, the U.S. Patent Trial and Appeal Board, Canadian courts, and seats of international arbitration.

III. INFORMATION CONSIDERED

9. My opinions are based on my years of education, research, personal experience, and professional experience, as well as my investigation and study of

relevant materials. I have reviewed the '218 patent, including the claims of the patent in view of the specification and file history. I have also reviewed a draft of the IPR petition, the documents cited in the petition, the materials cited in this Declaration, and other relevant background materials.

IV. LEGAL PRINCIPLES

10. I understand that the petitioner alleges that certain claims are unpatentable because they were “anticipated” under 35 U.S.C. §102 or “obvious” under 35 U.S.C. §103.

11. I am informed and understand that a patent claim is invalid if the claimed invention is not new. I am also informed and understand that for the claim to be invalid because it is not new, all of the requirements of the claim must have been described in a single previous publication or patent that predates the claimed invention. I am further informed and understand that, in patent law, these previous publications or patents are called “prior art references.” If a patent claim is not new, it is said to be “anticipated” by a prior art reference.

12. I understand that a reference is “prior art” if it was patented, described in a printed publication, in public use, on sale, or available to the public before the effective filing date of the claimed invention. I also understand a reference is prior art if it was described in a patent or application for patent in which the patent or

application names another inventor and was effectively filed before the effective filing date of the claimed invention.

13. I further understand that a patent claim is invalid if the claimed invention would have been obvious to a person of ordinary skill at the time the invention was made. I understand that “obvious” (in this context) means that even if all the requirements of a claim cannot be found in a single prior art reference, a person of ordinary skill who knew about certain prior art would have come up with the claimed invention.

14. I understand that an obviousness analysis takes into account: (1) the level of skill possessed by a person of ordinary skill at the time the claimed invention was made; (2) the scope and content of the prior art; (3) what difference, if any, existed between the claimed invention and the prior art; and (4) secondary considerations of non-obviousness, to the extent such considerations exist.

15. I understand that, in determining the level of ordinary skill, the following factors may be considered: (a) the levels of education and experience of persons working in the field; (b) the types of problems encountered in the field; and (c) the sophistication of the technology.

16. I understand that, for a reference to be considered prior art, it must be reasonably related to the claimed invention. I further understand that a reference is

reasonably related if it is in the same field as the claimed invention or is from another field to which a person of ordinary skill in the field would look to solve a known problem.

17. To assess the differences between prior art and the claimed subject matter, I understand that the claimed invention should be considered as a whole.

18. I have been advised that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. In evaluating whether such a claim would have been obvious, I understand that I may consider whether there is a motivation that would have prompted a person of ordinary skill in the art to combine the elements or concepts from the prior art in the same way as in the claimed invention.

19. I understand the rationales which may support a conclusion of obvious include:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;
- Use of known technique to improve similar devices (methods, or products) in the same way;

- Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

20. I understand that, for an obviousness argument based on a combination of prior art references, a person of ordinary skill in the art must be shown to have a motivation to combine or modify a reference with a reasonable expectation of success. The showing of a motivation to combine helps avoid hindsight bias.

21. I understand that I must be careful not to determine obviousness using the benefit of hindsight; many true inventions might seem obvious after the fact. I understand that when conducting an obviousness analysis, I should put myself in the position of a person of ordinary skill in the field at the time the claimed invention

was made. Using this perspective, I should not consider what is known today or what is learned from the teaching of the challenged patent.

22. I understand that secondary considerations of non-obviousness include, but are not limited to:

- commercial success of a product due to the merits of the claimed invention;
- a long felt need for the solution provided by the claimed invention;
- unsuccessful attempts by others to find the solution provided by the claimed invention;
- copying of the claimed invention by others;
- unexpected and superior results from the claimed invention
- acceptance by others of the claimed invention as shown by praise from others in the field or from the licensing of the claimed invention;
- other evidence tending to show non-obviousness; and
- independent invention of the claimed invention by others before or at about the same time as the named inventor thought of it.

23. I am also informed and understand that secondary considerations of non-obviousness must have a pertinent connection (“nexus”) to the asserted patent claims, and the patentee bears the burden of showing that such a nexus exists.

Whereas I do not address secondary considerations of non-obviousness in this declaration, I reserve the right to do so at a future date to the extent Patent Owner argues that such secondary considerations exist.

V. THE RELEVANT TIMEFRAME FOR ANALYSIS

24. For the purposes of this declaration, I will assume that the priority date of the '218 patent is August 15, 2017, being the filing date of the earliest provisional application in the chain of applications leading to the '218 patent.²

VI. PERSON OF ORDINARY SKILL IN THE ART

25. The technology at issue involves the mechanical arts and relatively simple fastening devices for wood and plastic composite deck and floor construction. For the purposes of this declaration and given the low complexity, I assume that a POSITA has at least an Associate's Degree in Mechanical Engineering or a related field with at least two years of experience in the design or analysis of fastening and joining methods applicable to wood and composite materials in construction. Additional education can compensate for less experience and vice versa.

26. I have conducted my analysis from the perspective of this person of ordinary skill in the art, as of August 15, 2017. Based on my advanced degrees in

² EX. 1001, Face.

engineering combined with my decades of hands-on experience with wood and composite construction and fasteners, I was a person of more than ordinary skill in the art as of August 15, 2017.

VII. CLAIM CONSTRUCTION

27. I understand that, in this proceeding, the claims are construed according to their ordinary and customary meaning, in light of the specification and prosecution history, as understood by a person of ordinary skill in the art at the time of the invention. I adopt this construction in my analysis herein. However, I understand that it is ultimately up to the PTAB to construe the claims. Should any PTAB construction differ from those adopted herein, I reserve the right to amend this declaration accordingly.

VIII. FIELD OF INVENTION

28. The field of invention of the '218 patent is that of fastening units to attach deck boards to underlying support structures.

IX. SUBJECT MATTER OF THE '218 PATENT

29. The '218 Patent is titled "Hidden Fastener Unit and Related Method of Use."³ The '218 Patent "relates to a fastener unit configured to fasten work pieces, such as boards, to support structures, such as joists, and more particularly to a

³ EX. 1001, Face.

fastener unit that engages a groove in the side of a board to secure the board to a support structure.”⁴ The ’218 Patent states that “nails or screws” used to fasten boards to joists “can frequently become discolored over time[] or can work themselves loose from the board and project upward from the board surface.”⁵ The ’218 Patent explains that “[n]ot only are these results aesthetically displeasing, they can present safety hazards.”⁶

30. The ’218 Patent concedes that hidden fastener systems already existed before the priority date of the ’218 Patent:

*Some manufacturers have developed hidden fastener systems that fit loosely within grooves of adjacent boards. These hidden fasteners typically include a biscuit-shaped upper plate having two horizontal flanges that fit into the grooves defined by the sides of adjacent deck boards, a single center hole through which a fastener extends to secure to the underlying joist, and a base that extends downward from the upper plate to an underlying joist.*⁷

⁴ *Id.*, 1:6-10.

⁵ *Id.*, 1:19-21.

⁶ *Id.*, 1:21-22.

⁷ *Id.*, 1:23-30.

31. FIG.1 is representative of the disclosure of the '218 Patent and is reproduced below.

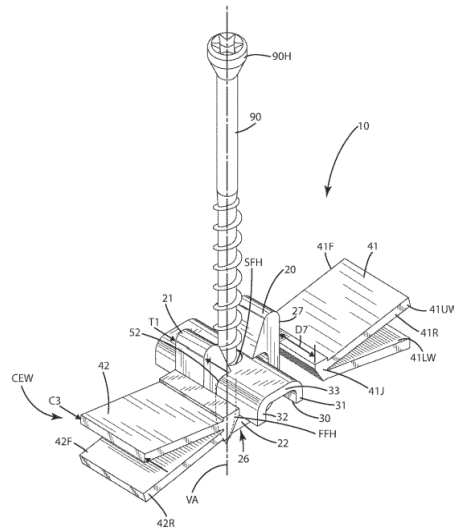


Fig. 1

Figure 1. Showing the '218 Patent at FIG. 1.

32. The Challenged Claim is reproduced below.

17. A fastener unit adapted to secure at least one board to a support, the fastener unit comprising:

a spacer block defining a first fastener hole, the spacer block having a thickness extending from a front surface to a rear surface, the thickness corresponding to a gap between a first board and a second adjacent board, the spacer block including a vertical axis;

a grip element extending from the spacer block, the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove, the grip element configured to receive a fastener through at least a portion of the grip element;

wherein the spacer block includes a first resilient compression element extending from the spacer block, the first resilient compression element being vertically compressible toward a first plane that is transverse to the vertical axis, the first resilient compression element configured to compress and fit in, and forcibly expand within the first groove of the first board, thereby securing the spacer block in a position adjacent the first groove defined by the first board, with the spacer block being disposed in the gap between the first board and the second adjacent board.⁸

⁸ *Id.*, Claim 17.

33. As shown above, the '218 Patent recites a “fastener unit” having various structural elements.⁹ I understand that a full claim listing is included as EX. 1007 and this Declaration adopts the labeling scheme reflected therein.

X. SUMMARY OF PRIOR ART CONSIDERED

34. The state of the art of concealed deck board fastening systems is reflected in the prior art I analyzed in detail and discussed below with respect to subsections A and B.

35. I analyzed two prior art patents in my investigation: Japanese patent JP2016061061A to Kitaura (“*Kitaura*”) (EX. 1004), U.S. patent application 2015/0354204 to Kinnunen et al. (“*Kinnunen*”) (EX. 1006).

⁹ See *id.*; see also *id.*, 1:56-63 (“A fastener unit and related method to secure a board to a support is provided. The fastener unit includes a spacer block, a grip element extending from the spacer block and configured to fit in and engage a groove of the board, and at least one element extending from the spacer block, configured to secure the spacer block adjacent the groove to establish a gap between the board and another board.”).

A. *Kitaura*

36. *Kitaura* is an Unexamined Patent Application Publication published by the Japanese Patent Office titled “Deck Board Mounting Bracket and deck Board Mounting Structure.”¹⁰ *Kitaura* “relates to a deck board mounting bracket and a deck board mounting structure for mounting deck boards forming a deck floor in a veranda, a balcony, a rooftop, a park, a boardwalk, or the like to a deck board supporting member such as a lumber girder or floor joist.”¹¹ *Kitaura*’s FIG. 15 is representative of its disclosure and is reproduced below:

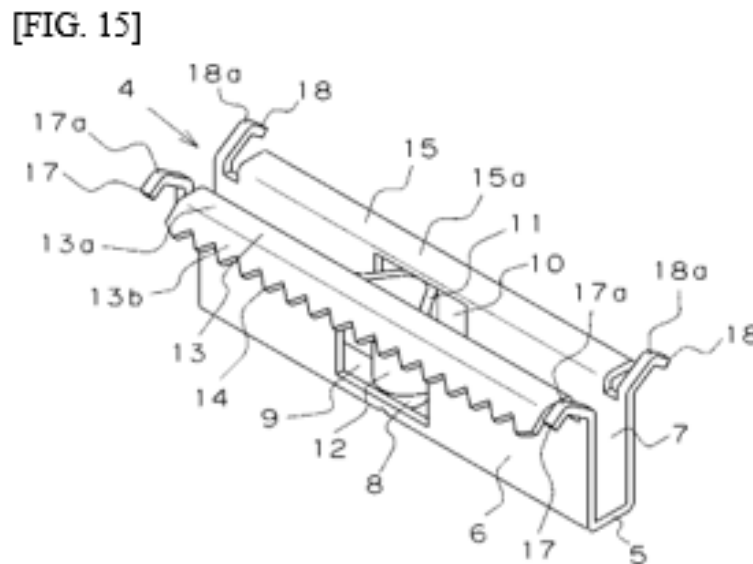


Figure 2. Showing Kitaura at FIG. 15.

¹⁰ EX. 1004, Face.

¹¹ *Id.*, [0001].

37. *Kitaura* describes several problems with existing mounting brackets which it attempts to address, including:

- “there being little capacity to absorb temperature-change-induced expansion and contraction of the deck boards in the widthwise direction,”¹²
- “water and debris readily accumulating between the first half and the second half, creating a risk of corrosion depending on the material of the mounting bracket,”¹³ and
- “the upper parts of the mounting brackets being readily visible to individuals above the deck boards, potentially marring appearance.”¹⁴

38. *Kitaura* describes that its mounting bracket includes a bottom part which corresponds with the space between a “leading deck board” and “a following deck board.”¹⁵ Using the terminology of the ’218 Patent, the bottom part of *Kitaura* is a “spacer block.”

¹² *Id.*, [0007].

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *See id.*, [0028], [0036], and FIG. 12.

39. *Kitaura* also describes that its mounting bracket includes elements used in conjunction to secure the mounting bracket to the boards while allowing for expansion and/or contraction in widthwise and lengthwise directions.¹⁶ Using the terminology of the '218 Patent, these elements are a “grip element.”

40. Finally, *Kitaura* describes that its mounting bracket includes “temporary fastening protrusions, which keep[] the mounting bracket from falling over and becoming dislodged from the groove in the deck board, or deviating from its prescribed position in the groove in the deck board groove contrary to the intent of a worker while the deck boards are being mounted.”¹⁷ Using the terminology of the '218 Patent, at least one temporary fastening protrusion is a “resilient compression element.”

B. *Kinnunen*

41. *Kinnunen* is a United States Patent Application Publication titled “A Fastening Member for Fastening Elongated Terrace Elements and an Arrangement Comprising the Same.”¹⁸ *Kinnunen* “relates to a fastening member for elements such

¹⁶ *See id.*, [0041]-[0044].

¹⁷ EX. 1004, [0022].

¹⁸ EX. 1006, Face.

[as] boards” and “an arrangement wherein the elements are fastened using such fastening members.”¹⁹ *Kinnunen*’s FIG. 4a is representative of its disclosure and is reproduced below:

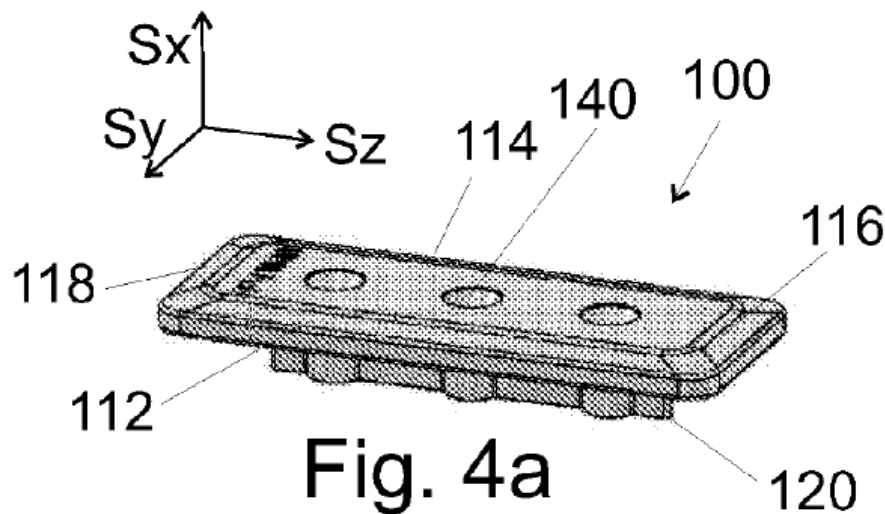


Figure 3. Showing Kinnunen’s FIG. 4a.

42. *Kinnunen* describes a problem with existing fastening members where “screws[] while penetrating through the elements both deteriorate the visual appearance and also provide a leakage for fluids, e.g. water, and moisture to

¹⁹ *Id.*, [0001].

penetrate into the element.”²⁰ *Kinnunen* further notes that “[t]his may reduce the service life of the decking board.”²¹

43. *Kinnunen* describes that its fastening member includes a “foot part 120” “[f]or a controlled separation between two elements.”²² Using the terminology of the ’218 Patent, foot part 120 is a “spacer block.”

44. *Kinnunen* also describes that its fastening member includes “extension 112” connected to “extension 114” to secure the mounting bracket to the elements.²³ Using the terminology of the ’218 Patent, “extension 112” connected to “extension 114”

²⁰ *Id.*, [0002].

²¹ *Id.*

²² *Id.*, [0114].

²³ *Id.*, [0094]-[0096] (“Referring to FIGS. 1b to 1d, a fastening member 100 comprises ***a first extension 112*** having a thickness T_e in a first direction S_x and extending in a second direction S_y , wherein the second direction S_y is perpendicular to the first direction S_x , ***a second extension 114 connected to the first extension 112*** and extending in a direction $-S_y$ that is reverse to the second direction S_y ,...”); *see also id.*, [0207] (“Preferably at least the extensions 112 (optionally 114, 116, 118) . . . fix the elements to a support.”).

is a “grip element.” More specifically, a POSITA would have understood *Kinnunen* describes a unified grip element because first and second extensions 112 and 114 are connected.

XI. GROUNDS

45. I have analyzed two grounds for the invalidity of the ’218 patent in view of the prior art. One ground is based on anticipation by *Kitaura* and one ground is based on obviousness over *Kitaura* considering *Kinnunen* or obviousness over *Kitaura* in view of the knowledge of a POSITA at the relevant time.

A. Ground 1 - Anticipation by *Kitaura*²⁴

46. In my opinion, *Kitaura* discloses each and every element of claim 17 of the ’218 patent. I understand this means *Kitaura* anticipates the claim, rendering it unpatentable under 35 USC §102.

²⁴ I note that *Kitaura* includes two examples when describing its disclosure. See EX. 1004, [0025], [0051]. *Kitaura* states that in its second example, “the shapes and installation positions of the first and second temporary fastening protrusions 17, 18 have been modified” (EX. 1004, [0051]) but clarifies that “the other features are the same as in example 1,” and that “...the same effects as in example 1 can be obtained” (see EX. 1004, [0053] and [0058]). Accordingly, for “the shapes and installation

1. Claim 17[p]: “A fastener unit adapted to secure at least one board to a support, the fastener unit comprising:”

47. To the extent the preamble is limiting, *Kिताura* discloses the preamble. For example, *Kिताura* discloses “[a] deck board mounting bracket and a deck board mounting structure.”²⁵ *Kिताura* further describes that “[t]he ***deck board 1 is mounted on a deck board supporting member 3*** shown in FIGS. 10–14, such as a lumber girder or floor joist composed of wood, engineered wood, a metal such as steel, or the like, ***using a deck board mounting bracket 4...***”^{26, 27} A POSITA would have understood that the recited “fastener unit” is the disclosed “deck board mounting bracket 4,” that the recited “at least one board” is the disclosed “deck board 1,” and that the recited “support” is the disclosed “deck board supporting member 3.” The

positions” of the temporary fastening protrusions (*i.e.*, the “recited resilient compression element”) I cite to the description and FIGs. associated with *Kिताura*’s example 2, and for all other features, the I cite to all description and FIGs. of *Kिताura* interchangeably.

²⁵ EX. 1004, [0005]

²⁶ EX. 1004, [0026].

²⁷ All emphasis is added unless otherwise noted.

spatial relationship of these elements is shown in the annotated FIGs. 12 and 13 from *Kitaura* below.

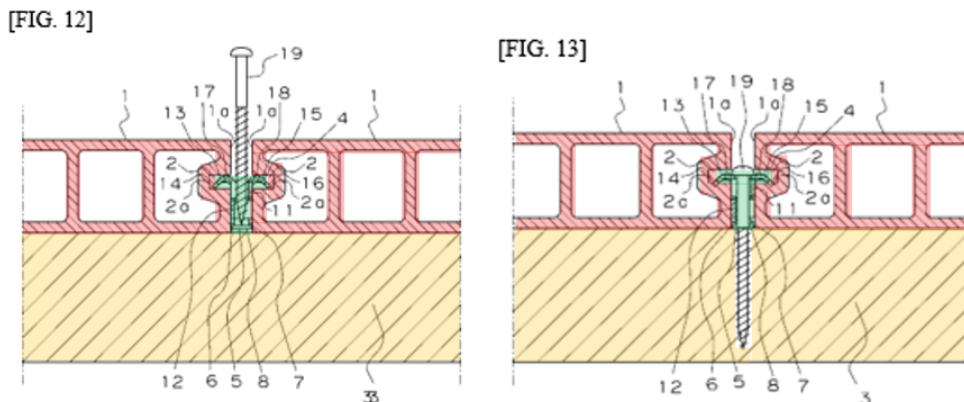
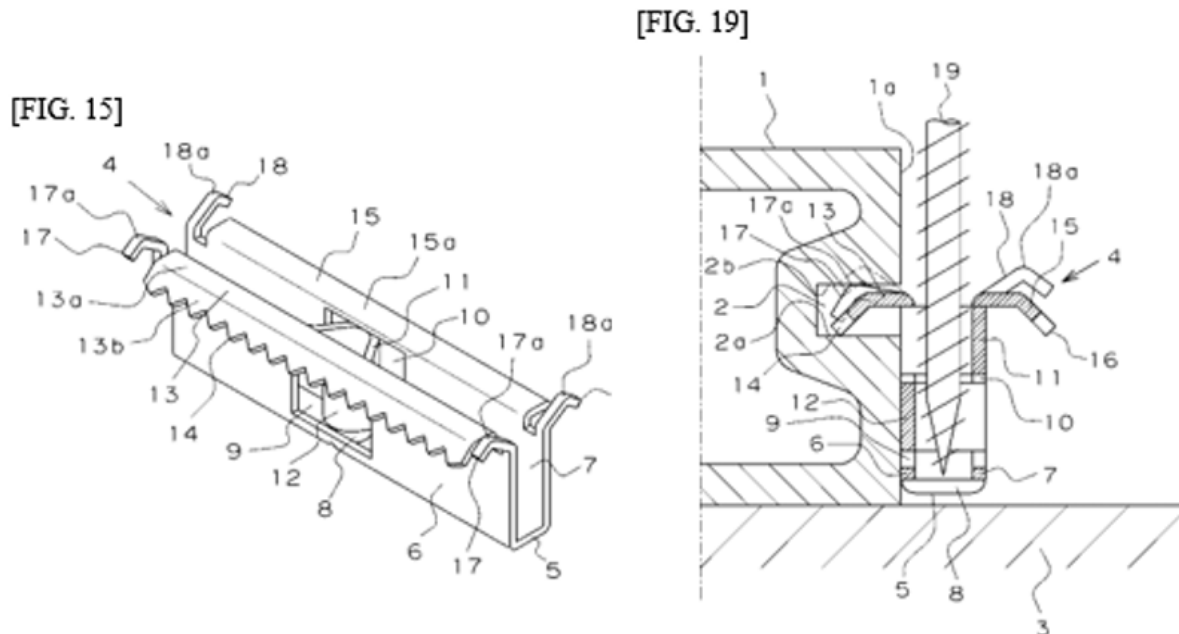


*Figure 4. Kitaura’s FIGs. 12 and 13 annotated to show deck boards 1 in red, deck board supporting member 3 in orange, and deck board mounting bracket 4 in green).*²⁸

48. As shown above, mounting bracket 4 in green (*i.e.*, the recited “fastener unit”) secures deck boards 1 in red (*i.e.*, the recited “board”) to supporting member

²⁸ As shown in the annotated FIGs. 12 and 13, deck board 1 may be multiple deck boards 1. *See e.g.*, EX. 1004, [0038] (“Next, when the screw 19 is rotated in the tightening direction, the screw 19 progressively descends, passes through the screw insertion hole 8 in the bottom part 5 of the deck board mounting bracket 4, and enters the deck board supporting member 3, thereby allowing ***the leading and following deck boards 1*** to be tightened via the deck board mounting bracket 4.”).

3 in orange (*i.e.*, the recited “support”) as the fastener is inserted.²⁹ *Kitaura* FIGs. 15 and 19 further disclose this limitation:



²⁹ See EX. 1004, [0038] (“... the screw 19 progressively descends, passes through the screw insertion hole 8 in the bottom part 5 of the deck board mounting bracket 4, and enters the deck board supporting member 3, ***thereby allowing the leading and following deck boards 1 to be tightened via the deck board mounting bracket 4.***”); see also EX. 1004, [0001] (“The present invention relates to a deck board mounting bracket and a deck board mounting structure for mounting deck boards forming a deck floor in a veranda, a balcony, a rooftop, a park, a boardwalk, or the like to a deck board supporting member such as a lumber girder or floor joist.”).

Figure 5. With respect to Claim 17[p], “[a] deck board mounting bracket and a deck board mounting structure” disclosed in Kitaura Figs. 15 and 19 and described in Kitaura generally.

49. For at least these reasons, a POSITA would have understood that Kitaura discloses the ’218 Patent Claim 17 preamble.

2. **Claim 17[a]: “a spacer block defining a first fastener hole,”**

50. Kitaura discloses “a spacer block defining a first fastener hole.”

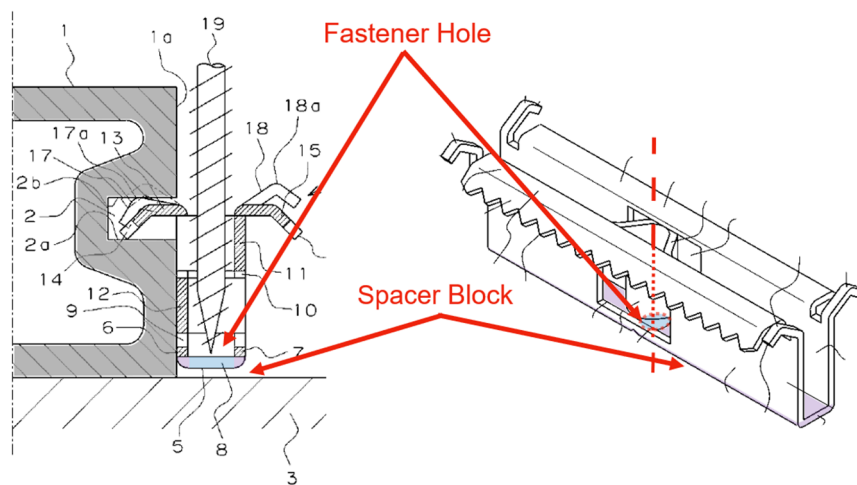


Figure 6. Spacer block (“bottom part 5”) defining a first fastener hole (“screw insertion hole 8”) disclosed in Kitaura Figs. 15 and 19 and described in Kitaura [0028].

51. For example, Kitaura describes “[a] **bottom part 5** ha[ving] an elongated, flat, and rectangular shape that extends in a plane that is horizontal when

the deck board mounting bracket 4 is placed horizontally.”³⁰ *Kitaura* further describes that “[a] *screw insertion hole 8 is provided in the bottom part 5.*”³¹

52. A POSITA would have understood that the recited “spacer block” is the disclosed “bottom part 5” and that the recited “first fastener hole” is the disclosed “screw insertion hole 8.” The spatial relationship of these elements is shown in the annotated FIGs. 6 and 15 from *Kitaura* below.

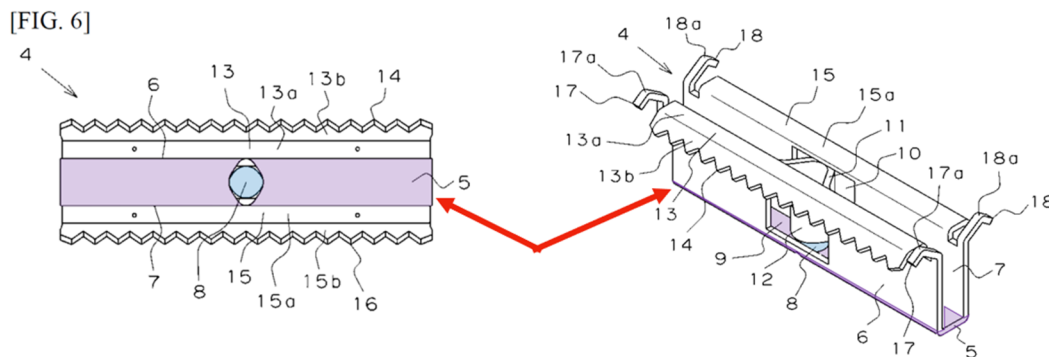


Figure 7. Kitaura's FIGs. 6 and 15 annotated to show bottom part 5 in purple and screw insertion hole 8 in blue.

53. As shown above, bottom part 5 (*i.e.*, the recited “spacer block”) defines a screw insertion hole 8 (*i.e.*, the recited “first fastener hole”).

³⁰ EX. 1004, [0028].

³¹ *Id.*; see also *id.*, [0014].

54. A POSITA would have understood that bottom part 5 is the recited “spacer block” at least because its thickness corresponds to the gap between deck boards 1. For example, *Kitaura* describes that:

A bottom part 5 has an elongated, flat, and rectangular shape that extends in a plane that is horizontal when the deck board mounting bracket 4 is placed horizontally. A first rising face 6 and a second rising face 7 that are flat and *bent in the orthogonal direction upward from the bottom part 5 are provided at both ends of the bottom part 5 in the widthwise direction*. As a result, the first rising face 6 and the second rising face 7 oppose each other in a parallel state.³²

55. In other words, a POSITA would have understood that deck boards 1 are spaced apart by a distance defined by the ends of bottom part 5 in the widthwise direction. This spatial relationship is illustrated in the annotated FIG. 14 from *Kitaura* below.

³² EX. 1004, [0028].

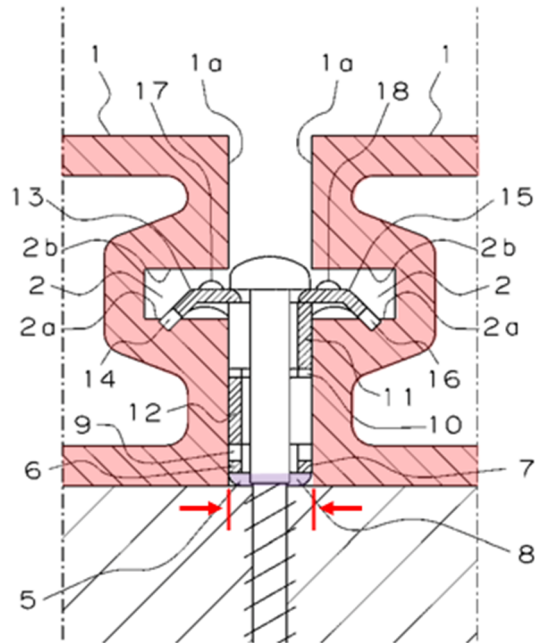


Figure 8. Kitaura's FIG 14 excerpted and annotated to show bottom part 5 in purple and deck boards 1 in red.

56. Alternatively, a POSITA would have understood that portions of first rising face 6 and second rising face 7 may be considered part of the recited "spacer block." Specifically, a POSITA would have understood that the bottom of first open part 9 and second open part 10 provide a natural delineation for which portions of rising faces 6 and 7 belong to the recited "spacer block" as shown below.

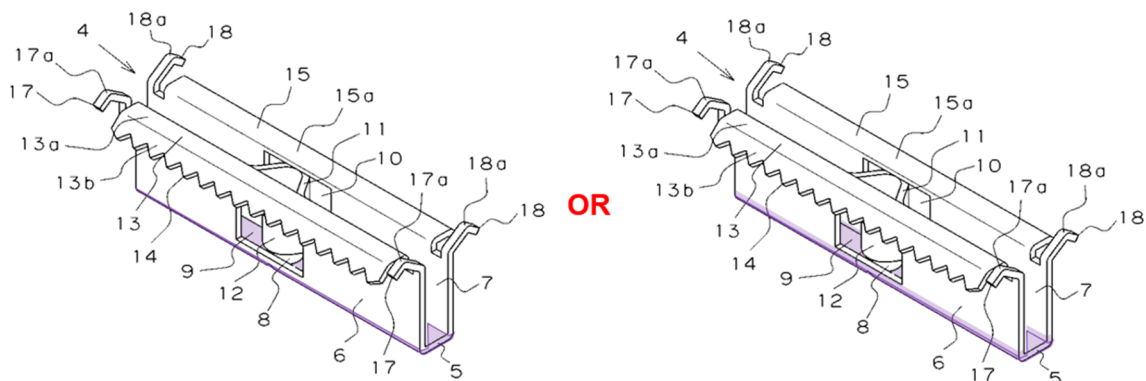


Figure 9. Kitaura's FIGs. 15 annotated to show the recited "spacer block" as bottom part 5 only (left) and the alternative where the recited "spacer block" also includes portions of first rising face 6 and second rising face 7 up to the bottom of first open part 9 and second open part 10.

[FIG. 19]

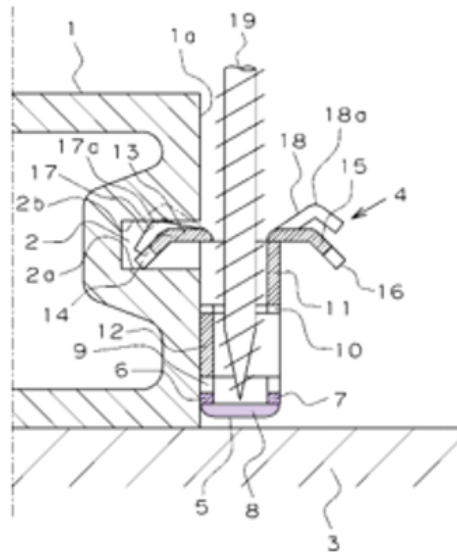


Figure 10. Kitaura's FIG. 19 annotated to show a profile view of the mounting bracket with the portions making up the alternative embodiment of recited "spacer block" in purple.

57. Besides the natural delineation of first open part 9 and second open part 10, a POSITA would have understood that the portions of first rising face 6 and second rising face 7 acting as a "grip element" (explained *infra*. Section XI.A.5-7) would deform more in portions away from bottom part 5 and that the portions closest to bottom part 5 would be unlikely to deform at all. Thus, a POSITA would have understood that the lowest portion of first rising face 6 and second rising face 7 act as part of the recited "spacer block."

58. A POSITA would have understood that screw insertion hole 8 is the recited “first fastener hole” at least because it is a hole designed for the fastener to pass through.³³

59. A POSITA would have understood that bottom part 5 (*i.e.*, the recited “spacer block”) defines screw insertion hole 8 (*i.e.*, the recited “first fastener hole”) as claimed at least because screw insertion hole 8 is a hole punched out of bottom part 5 and bottom part 5 surrounds screw insertion hole 8.³⁴

³³ See EX. 1004, [0035] (“... a screw 19 is inserted part way into *an insertion path for the screw 19 constituted by the screw insertion hole 8* ...”); [0038] (“Next, when *the screw 19* is rotated in the tightening direction, the screw 19 progressively descends, *passes through the screw insertion hole 8 in the bottom part 5* of the deck board mounting bracket 4, and enters the deck board supporting member 3, ...”).

³⁴ See EX. 1004, [0028] (“A screw insertion hole 8 is provided in the bottom part 5. In the present example, the screw insertion hole 8 is formed by first punching a hole in the sheet of metal, . . .”).

[FIG. 6]

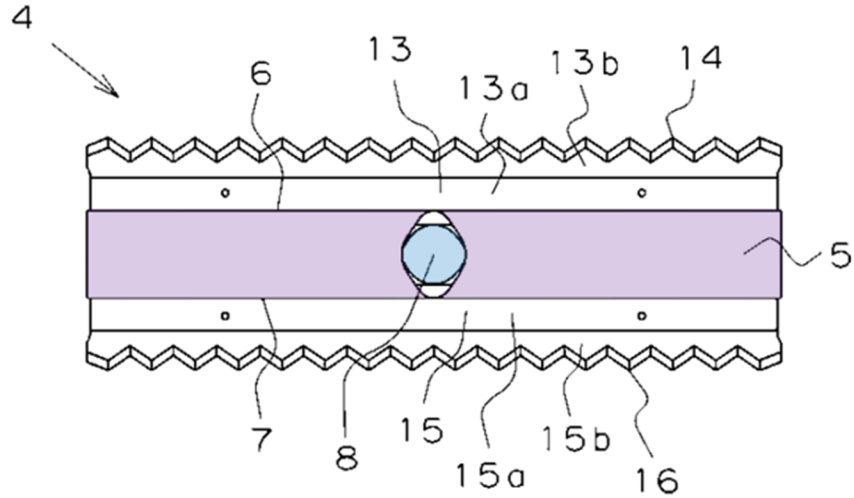


Figure 11. Kitaura's FIG. 6 showing a bottom view of mounting bracket 4 annotated to show bottom part 5 in purple and screw insertion hole 8 in blue.

60. Additional highlighted figures showing Kitaura's disclosure are included below:

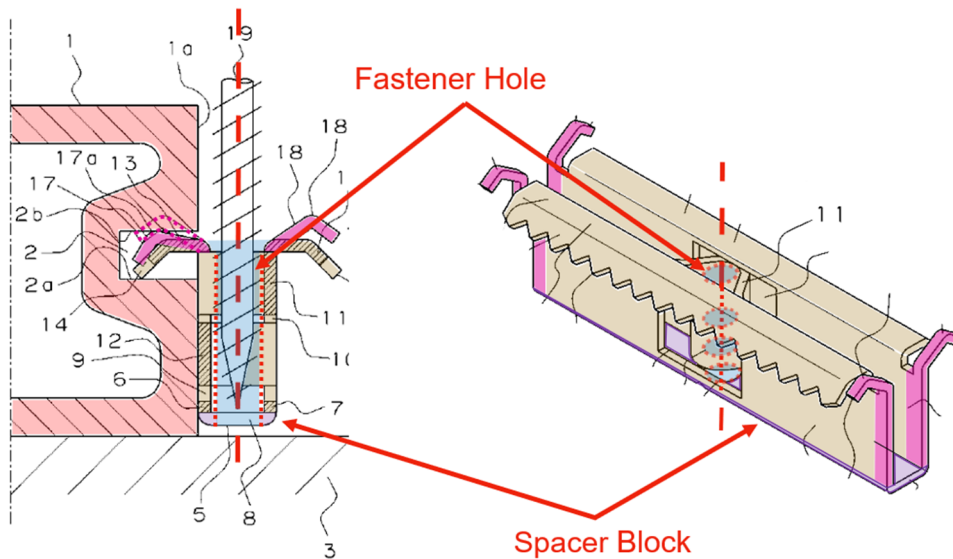


Figure 12. Device disclosed in Kitaura Figs. 19 and 15 with added coloring to distinguishing between various portions of the device. The spacer block is in purple, the grip element (discussed below) in brown, and the resilient elements (discussed below) are in pink.

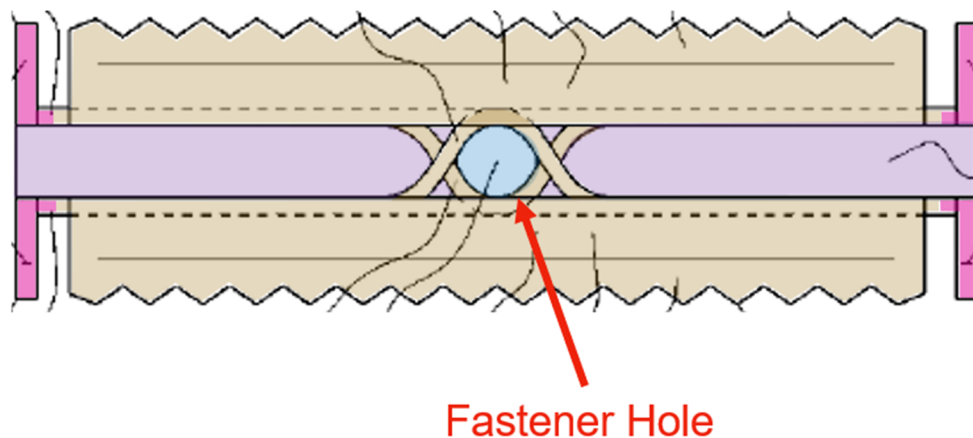


Figure 13. Top view of the device disclosed in Kitaura Fig. 18 showing the fastener hole. The fastener hole extends through both the grip element and the spacer block as discussed further below. The color key is the same as in Figure 12 above.

61. Thus, *Kitaura* discloses “a spacer block defining a first fastener hole,” as claimed.

3. Claim 17[b]: “the spacer block having a thickness extending from a front surface to a rear surface, the thickness corresponding to a gap between a first board and a second adjacent board,”

62. *Kitaura* discloses “the spacer block having a thickness extending from a front surface to a rear surface, the thickness corresponding to a gap between a first board and a second adjacent board.”

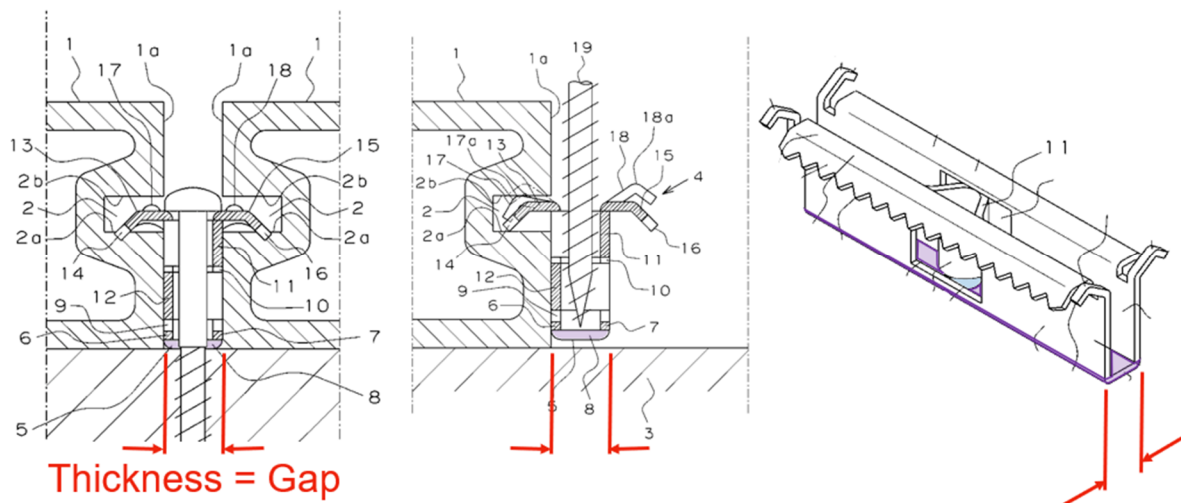


Figure 14. Kitaura's Figs. 14, 15, and 19 annotated to show that the thickness of Kitaura's bottom spacer portion 5 corresponds to the gap between adjacent boards.

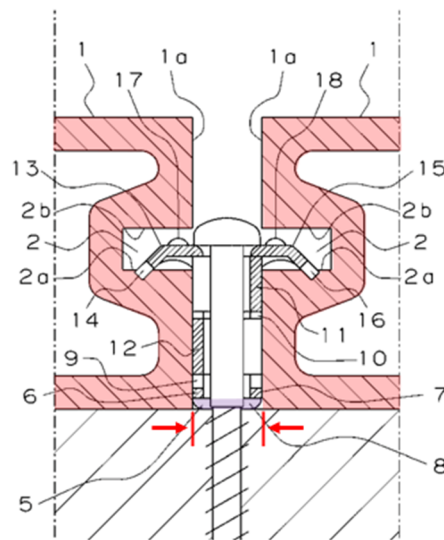
63. As discussed above, a POSITA would have understood the bottom part 5 disclosed in *Kitaura* as the recited “spacer block.”³⁵ *Kitaura* describes that “[a] first rising face 6 and a second rising face 7 that are flat and bent in the orthogonal direction upward from the bottom part 5 are provided ***at both ends of the bottom part 5 in the widthwise direction.***”³⁶ Here, a POSITA would have understood that

³⁵ Or, as explained above, a POSITA would understand portions of first rising face 6 and second rising face 7 may combine with bottom part 5 to form the recited “spacer block”).

³⁶ EX. 1004, [0028].

the recited “front surface” is the disclosed first end of “bottom part 5” and the recited “rear surface” is the disclosed second end of “bottom part 5.”³⁷

64. A POSITA would have understood the recited “thickness extending from a front surface to a rear surface,” is the disclosed distance between “the ends of the bottom part 5 in the widthwise direction.” The spatial relationship of these elements is shown in the annotated FIG. 14 from *Kitaura* below.



³⁷ A POSITA would have understood that in the embodiment where the lowest portions of first rising face 6 and second rising face 7 make up part of the recited “spacer block,” the front surface may alternatively be the outer surface of first rising face 6 and the rear surface may alternatively be the outer surface of second rising face 7. The recited thickness is the same. *Id.*

Figure 15. Kitaura's FIG. 14 excerpted and annotated to show bottom part 5 in purple and deck boards 1 in red.

65. As discussed above, deck boards 1 will be spaced apart at a distance defined by *the ends of bottom part 5 in the widthwise direction* (i.e., the recited “thickness corresponding to [the] gap”).

66. Thus, *Kitaura* discloses “the spacer block having a thickness extending from a front surface to a rear surface, the thickness corresponding to a gap between a first board and a second adjacent board,” as claimed.

4. Claim 17[c]: “the spacer block including a vertical axis;”

67. *Kitaura* discloses “the spacer block including a vertical axis.”

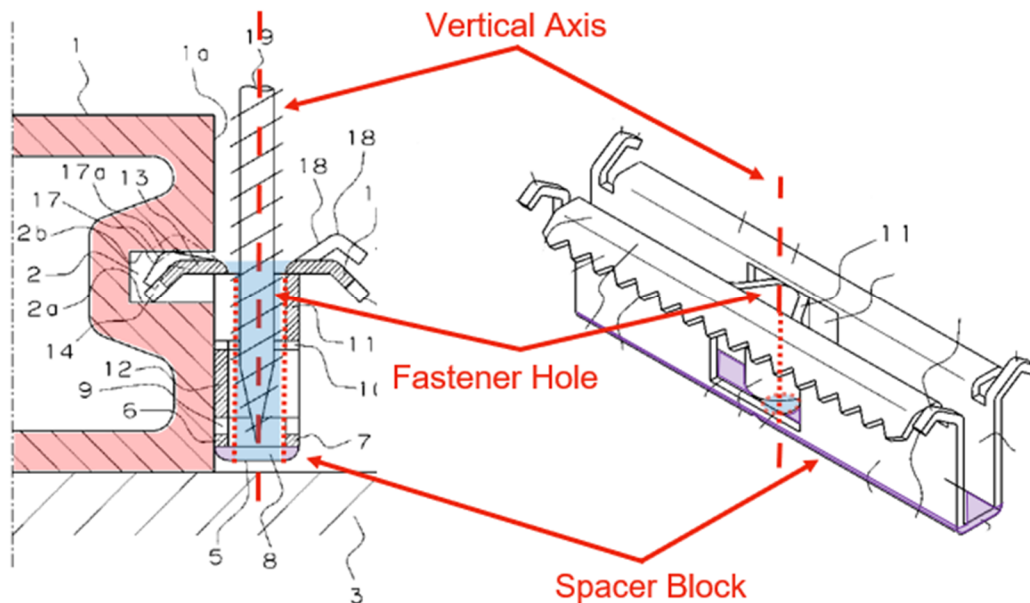


Figure 16. Kitaura Figs. 15 and 19 disclose that bottom portion 5 (spacer block) has a hole 8 in the center for a screw. The central axis of the hole is vertical. Hence Kitaura discloses the spacer block including a vertical axis.

68. For example, *Kitaura* describes that “[a] screw insertion hole 8 is provided in the bottom part 5” and that “bottom part 5 has [a] . . . shape that extends in a plane that is horizontal when the deck board mounting bracket 4 is placed horizontally.”³⁸ Thus, a POSITA would have understood that the axis running through screw insertion hole 8, is the recited vertical axis. The spatial relationship of these elements is shown in the annotated FIGs. 12 and 13 from *Kitaura* below.

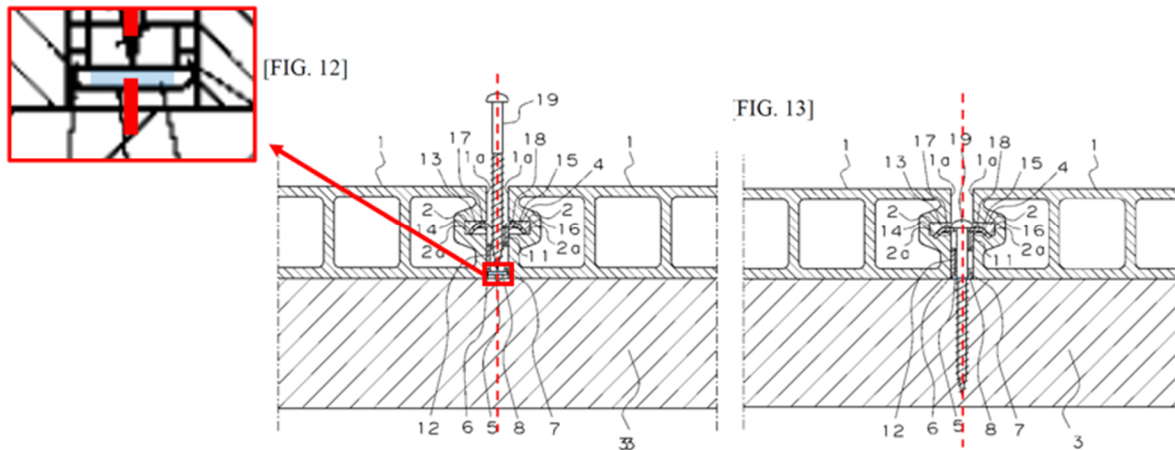


Figure 17. Kitaura's FIGs. 12 and 13 annotated to show screw insertion hole 8 in blue and the vertical axis as a dashed red line.

69. The verticality of the axis is reinforced by the disclosure in *Kitaura* that the axial direction of the arc shape feature 11 formed from the side wall 6 is vertical.³⁹ The central axis of the arc shape feature is aligned with the central axis of

³⁸ EX. 1004, [0028].

³⁹ See *Kitaura*, [0029].

the hole 8 in bottom portion 5 (spacer block) and the arc shape feature is vertically above the bottom portion. Moreover, *Kitaura* states, “The screw insertion hole 8, the first screw-supporting part 11, and the second screw-supporting part 12 are arranged coaxially,” which confirms the vertical direction of the axis.

70. Thus, *Kitaura* discloses “the spacer block including a vertical axis” as claimed.

5. Claim 17[d]: “a grip element extending from the spacer block,”

71. *Kitaura* discloses “a grip element extending from the spacer block.” For the reasons discussed below, the portions of *Kitaura*’s mounting bracket 4 highlighted in brown are the recited “grip element”:

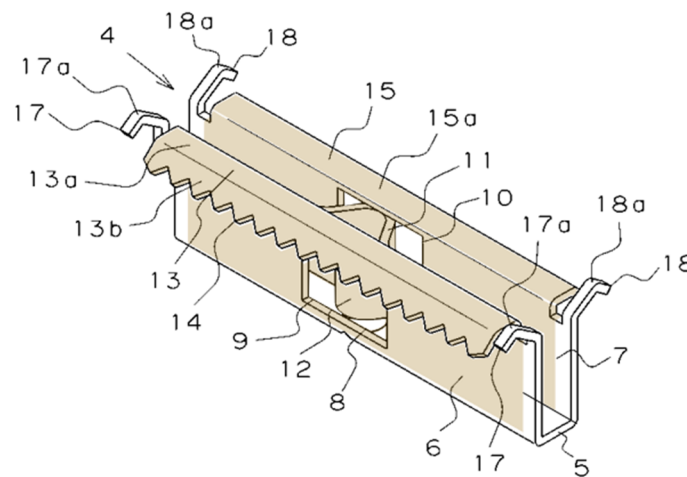


Figure 18. Kitaura’s FIG. 15 annotated to show the elements making up the recited “grip element” in brown.

[FIG. 8]

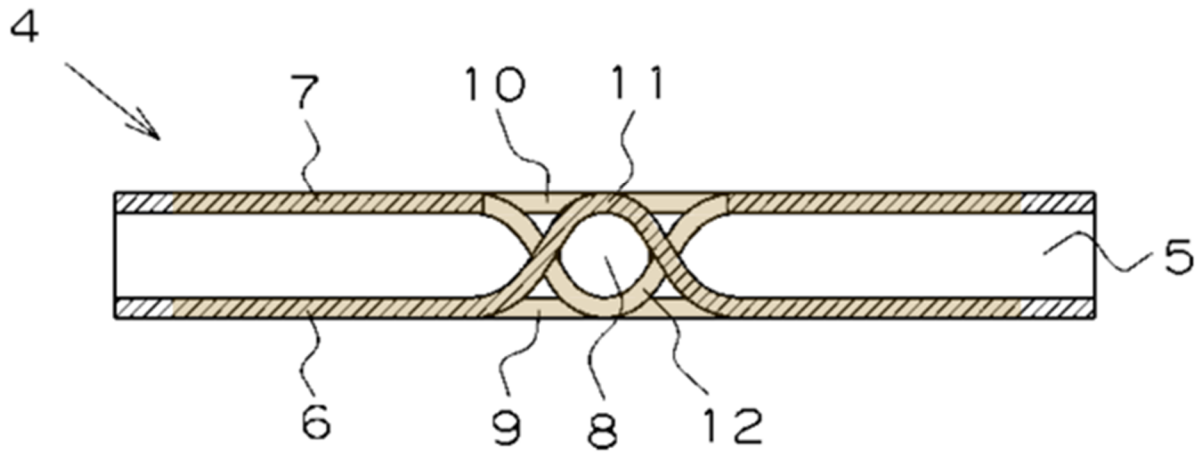


Figure 19. Kitaura's FIG. 8 annotated to show the elements making up recited "grip element" in brown.

72. For example, Kitaura first describes:

*A **first fastening part 13** that bends from the upper end of the **first rising face 6** in the lateral direction away from the **second rising face 7** is formed on said upper end. Downward-projecting triangular tooth-shaped **first fastening part biting protrusions 14** are provided on the distal end of the **first fastening part 13**. More specifically, the **first fastening part 13** comprises a first horizontal part 13a having a flat main part that is bent in the orthogonal direction from the **first rising face 6** and a **first slanted part 13b** that is bent diagonally downward from the **first horizontal part 13a**, and the **first fastening part biting protrusions 14** are provided on the distal end of the **first***

*slanted part 13b and project diagonally downward.*⁴⁰

73. A POSITA would have understood that all of first fastening part 13, biting protrusions 14, and portions of rising face 6 form part of the recited “grip element” for the reasons discussed below.

74. Next, *Kitaura* describes:

*Similarly, a second fastening part 15 that bends from the upper end of the second rising face 7 in the lateral direction away from the first rising face 6 is formed on said upper end. Downward-projecting triangular tooth-shaped second fastening part biting protrusions 16 are provided on the distal end of the second fastening part 15. More specifically, the second fastening part 15 comprises a second horizontal part 15a having a flat main part that is bent in the orthogonal direction from the second rising face 7 and a second slanted part 15b that is bent diagonally downward from the second horizontal part 15a, and the second fastening part biting protrusions 16 are provided on the distal end of the second slanted part 15b and project diagonally downward.*⁴¹

⁴⁰ EX. 1004, [0031].

⁴¹ EX. 1004, [0031].

75. A POSITA would have understood that all of second fastening part 15, biting protrusions 16, and portions of rising face 7 form part of the recited “grip element” for the reasons discussed below.

76. Finally, *Kitaura* describes:

*A rectangular first open part 9 is formed in the center of the lower side of the **first rising face 6**. A rectangular second open part 10 is formed in the center of the upper side of the **second rising face 7**. A **first screw-supporting part 11** projecting into the second open part 10 is formed in the center of the first rising face 6 on the upper side by leaving both ends of the first rising face 6 in the lateral direction uncut, and curvingly projecting the same toward the second rising face 7 so as to form a general arc shape, the axial direction thereof being in the vertical direction. A **second screw-supporting part 12** projecting into the first open part 9 is formed in the center of the upper side of the second rising face 7 by leaving both ends of the second rising face 7 in the lateral direction uncut and curvingly projecting the same toward the first rising face 6 so as to form a general arc shape the axial direction thereof being in the vertical direction. The screw insertion hole 8, the **first screw-supporting part 11**, and the **second***

screw-supporting part 12 are arranged coaxially.⁴²

77. A POSITA would have understood that all of first screw-supporting part 11 and second screw supporting part 12 form part of the recited “grip element” for the reasons discussed below. The spatial relationship of these components is shown below in the annotated FIG. 15 from *Kitaura*.

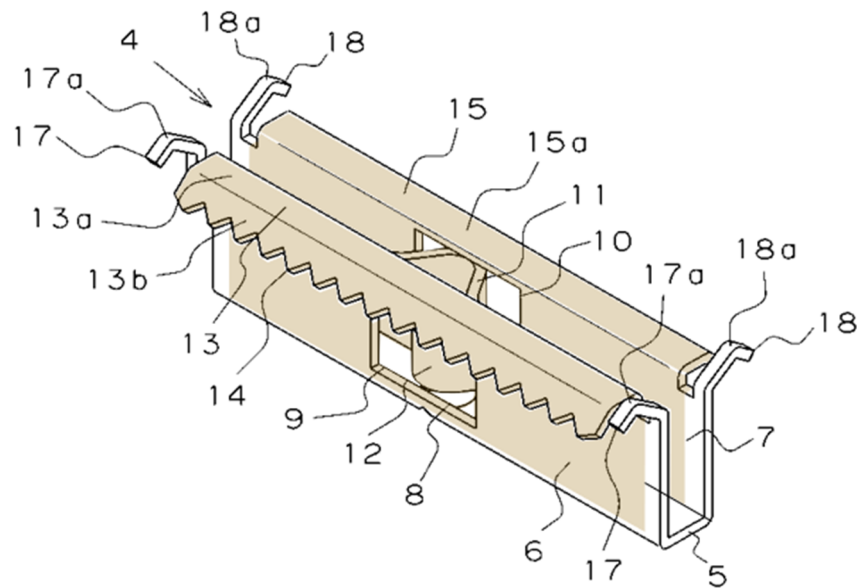


Figure 20. Kitaura’s FIG. 15 annotated to show the elements forming the recited “grip element” in brown.

78. A POSITA would have understood that the above-described elements (*i.e.*, those described above and highlighted in brown in the annotated figure above) form the recited “grip element” at least because they work together to secure the mounting bracket 4 to the boards 1 in a way consistent with *Kitaura*’s described

⁴² EX. 1004, [0029].

design goals. For example, *Kitaura* describes “one object of the present invention is to provide a deck board mounting bracket and a deck board mounting structure that are capable of increasing the amount of temperature-change-induced expansion and contraction of deck boards in the widthwise direction of the deck boards that can be absorbed.”⁴³ *Kitaura* was concerned with improving on JP 2011-236601 (*Kitaura* ’601) (EX. 1011) which is referred to in *Kitaura* as “Patent Document 2.”⁴⁴ *Kitaura* recognized a problem in *Kitaura* ’601 where “the folded-back part that forms the boundary between the first half and the second half progressively narrows in width towards the top, and the first opposing face of the first half and the second opposing face of the second half are provided in proximity to each other, resulting in problems such as (a) there being little capacity to absorb temperature-change-induced expansion and contraction of the deck boards in the widthwise direction”⁴⁵ *Kitaura* addressed this identified problem of *Kitaura* ’601 by increasing the distance between the “first half” and the “second half” described above.

⁴³ EX. 1004, [0009].

⁴⁴ EX. 1004, [0006].

⁴⁵ EX. 1004, [0007].

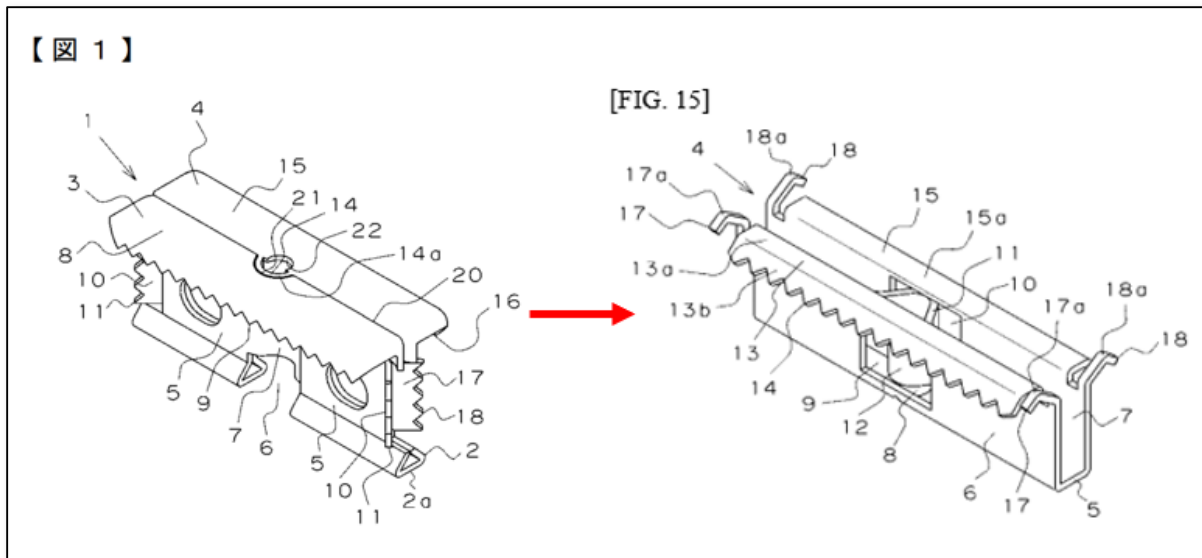


Figure 21. Showing Kitaura '601's FIG. 1 (left) and Kitaura's FIG. 15 (right)).

79. As shown above, besides increasing the distance between the “first half” and the “second half,” *Kitaura* also adds first screw-supporting part 11 and second screw supporting part 12 to its design, as compared to *Kitaura* '601.

80. *Kitaura* describes how the above-described components act in concert to meet *Kitaura*'s design goal of securing boards 1 to deck board supporting member 3 while allowing for expansion and/or contraction of the boards 1. For example, *Kitaura* describes that “[i]n this deck board mounting bracket 4 and deck board mounting structure, when the screw 19 is tightened, the **first fastening part biting protrusions 14** and the **second fastening part biting protrusions 16 bite into the lower surfaces 2a of the mounting grooves 2 in the deck boards 1 on both sides and fasten the deck boards 1 on both sides**, thus making it possible to prevent

unrestricted movement of the deck boards 1 in the widthwise direction and the lengthwise direction.”⁴⁶ In other words, *Kitaura* describes that the first and second fastening parts 13 and 15 (including first and second fastening part biting protrusions 14 and 16) act to limit the unrestricted movement of deck boards 1 in both the widthwise and lengthwise directions.

81. However, as discussed above, *Kitaura* recognized that the deck boards 1 may expand and/or contract and thus *Kitaura* describes that “even if the deck boards 1 expand or contract in the widthwise direction of the deck boards 1 (the left-right direction in FIGS. 13 and 14) due to changes in temperature, the distance between the *first rising face 6 and the second rising face 7 changes in such a way that the distance between the first fastening part 13 and the second fastening part 15 changes . . . thus making it possible to absorb the expansion or contraction of the deck boards 1.*”⁴⁷ In other words, *Kitaura* describes how rising faces 6 and 7 act—with fastening parts 13 and 15 (including first and second fastening part biting protrusions 14 and 16)—to allow *Kitaura*’s grip element to absorb expansion or contraction in the *widthwise* direction.

⁴⁶ EX. 1004, [0040].

⁴⁷ EX. 1004, [0041].

82. *Kitaura* also describes how its grip element accommodates lengthwise expansion and/or contraction of the deck boards 1. For example, *Kitaura* explains “[a]s concerns the lengthwise direction of the deck boards 1 [], by making the inner diameter of the part of the deck board mounting bracket 4 into which the screw 19 is inserted (*between the inner surface of the first screw-supporting part 11 and the inner surface of the second screw-supporting part 12* and into the screw insertion hole 8) sufficiently larger than the shank diameter of the screw 19 and creating play therebetween, *or through elastic deformation of the first screw-supporting part 11 and the second screw-supporting part 12*, relative movement between the screw 19 and the deck board mounting bracket 4 becomes possible, thus making it possible to absorb expansion and contraction of the deck boards 1 caused by changes in temperature.”⁴⁸ In other words, *Kitaura* describes how first screw-supporting part 11 and second screw-supporting part 12 act—with rising faces 6 and 7 as well as fastening parts 13 and 15 (including first and second fastening part biting protrusions 14 and 16)—to allow *Kitaura*’s grip element to absorb expansion and/or contraction in the *lengthwise* direction.

⁴⁸ EX. 1004, [0042].

83. Accordingly, a POSITA would have understood that all of portions of rising face 6, portions of rising face 7, first fastening part 13, biting protrusions 14, second fastening part 15, biting protrusions 16, first screw-supporting part 11, and second screw supporting part 12 form the recited grip element at least because they all work together to secure the mounting bracket 4 to the boards 1 and the boards 1 to support 3 while allowing for expansion and/or contraction of the boards 1 according to an express design goal of *Kitaura*. Thus, as discussed above, a POSITA would have understood the elements highlighted in brown in the annotated FIG. 15 of *Kitaura* below as being the recited “grip element.”

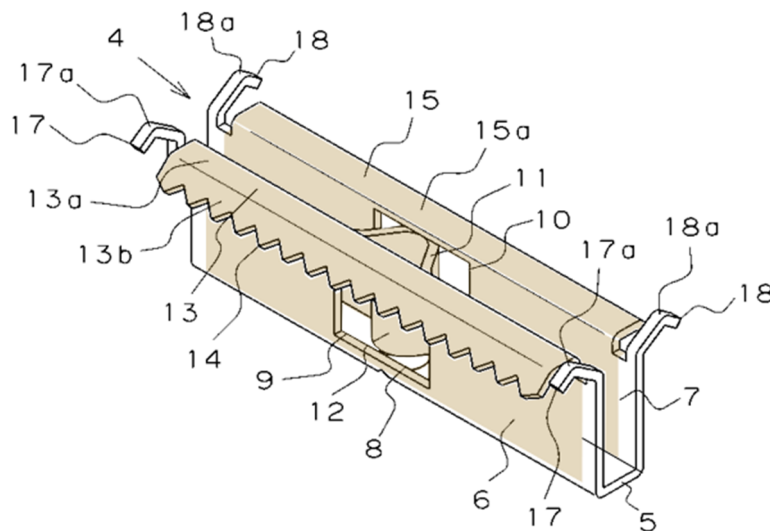


Figure 22. Kitaura's FIG. 15 annotated to show the elements forming the recited “grip element” in brown.

84. A POSITA further would have understood that *Kitaura*'s grip element extends from bottom part 5 (*i.e.*, the recited “spacer block”). For example, *Kitaura* describes “[a] first rising face 6 and a second rising face 7 that are flat and bent in

the orthogonal direction upward from the bottom part 5 are provided at both ends of the bottom part 5 in the widthwise direction.”^{49, 50} *Kitaura* also describes that “a first fastening part 13 that bends from the upper end of the first rising face 6 in the lateral direction away from the second rising face 7 is formed on said upper end” and “a second fastening part 15 that bends from the upper end of the second rising face 7 in the lateral direction away from the first rising face 6 is formed on said upper end.”⁵¹ *Kitaura* further describes “first screw-supporting part 11 projecting into the second open part 10 is formed in the center of the first rising face 6” and “a second screw-supporting part 12 projecting into the first open part 9 is formed in the center of the upper side of the second rising face 7.”⁵² The spatial relationship of these elements is shown below in the annotated FIG. 15 from *Kitaura*.

⁴⁹ EX. 1004, [0028].

⁵⁰ This is true whether the recited “spacer block” is bottom part 5 only, as shown, or if it includes portions of rising faces 6 and 7 as described in the alternative discussed above with respect to Claim 17[a]. See *supra*. Section XI.A.2.

⁵¹ EX. 1004, [0030] and [0031].

⁵² EX. 1004, [0029].

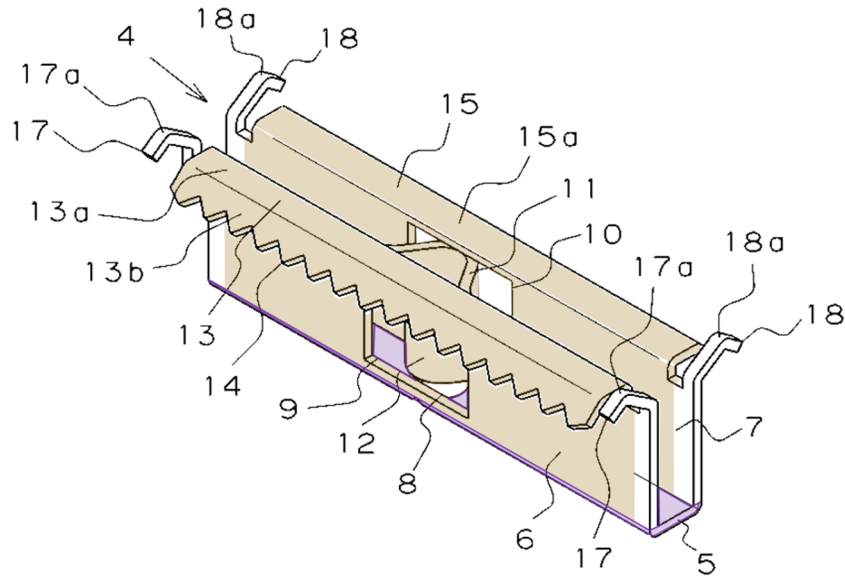


Figure 23. Kitaura's FIG. 15 annotated to show the "grip element" in brown and bottom part 5 (i.e., the recited "spacer block") in purple.

85. As shown above and described in the above excerpts from *Kitaura*, the portions of rising faces 6 and 7 in *Kitaura*'s grip element are "provided at both ends of the bottom part 5 [(i.e., the recited "spacer block") in the widthwise direction."⁵³ Accordingly, a POSITA would have understood that *Kitaura*'s grip element extends from bottom part 5 (i.e., the recited "spacer block").

86. Thus, *Kitaura* discloses "a grip element extending from the spacer block," as claimed.

⁵³ See EX. 1004, [0028].

6. Claim 17[e]: “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove”

87. *Kitaura* discloses “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove.”

88. First, *Kitaura* discloses that the grip element fits in the groove of the first board. *Kitaura*’s Abstract discloses how the fastening unit interacts with side grooves in adjacent boards:

*With the fastening parts 13, 15 inserted into mounting grooves provided in side surfaces of deck boards to both sides, a screw inserted between the screw-supporting parts 11, 12 and into a screw insertion hole 8 provided in the bottom part 5 is screwed into a deck board supporting member and tightened to cause biting protrusions 14 on the distal ends of the fastening parts 13, 15 to bite into the lower surfaces of the mounting grooves, thereby fastening the deck boards on both sides to the deck board supporting member.*⁵⁴

89. For example, *Kitaura* describes that “the first fastening part 13 is inserted into the mounting groove 2 in the deck board 1, and the first rising face 6 is

⁵⁴ EX. 1004, [Abstract].

brought into contact with the side surface 1a of the deck board 1.”⁵⁵ *Kitaura* also describes that “first rising face 6 and a second rising face 7 [] are flat and bent in the orthogonal direction upward from the bottom part 5 [] at both ends of the bottom part 5 in the widthwise direction.”⁵⁶ The spatial relationship of these elements is shown below in the annotated FIG. 19 from *Kitaura*.

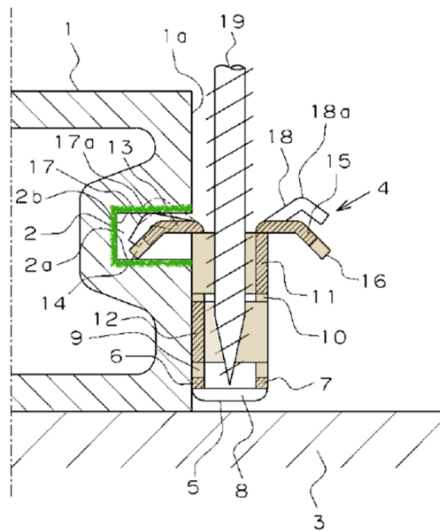


Figure 24. Kitaura’s FIG. 19 annotated to show mounting groove 2 in green and the elements described above as disclosing the grip element in brown.

90. As shown above, first fastening part 13 (*i.e.*, a portion of the recited “grip element” as discussed above) fits in mounting groove 2 (*i.e.*, the recited “first groove defined by the first board”).

⁵⁵ EX. 1004, [0035].

⁵⁶ EX. 1004, [0028].

91. Next, *Kitaura* also discloses that the grip element engages the groove. For example, *Kitaura* describes that biting protrusions 14 (also part of the recited “grip element” as described above) “**bite** into the lower surfaces 2a of the mounting grooves 2 in the deck boards 1.”⁵⁷

92. Finally, *Kitaura* also discloses that bottom part 5 (*i.e.*, the recited “spacer block”) does not extend into the groove. For example, *Kitaura* describes rising faces 6 and 7 are positioned against boards 1⁵⁸ and rising faces 6 and 7 extend in an “orthogonal direction upward from the bottom part 5 [] at **both ends** of the bottom part 5 in the widthwise direction.”⁵⁹ The spatial relationship of these components is shown below in the annotated FIG. 19 from *Kitaura*.

⁵⁷ EX. 1004, [0038].

⁵⁸ See EX. 1004, [0035] (“the first rising face 6 is brought into contact with the side surface 1a of the deck board 1.”

⁵⁹ EX. 1004, [0028].

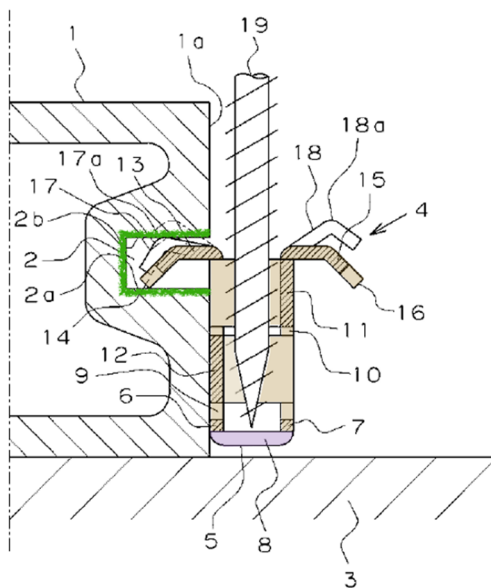


Figure 25. Kitaura's FIG. 19 (annotated to show mounting groove 2 in green, bottom part 5 in purple, and the elements described above as disclosing the grip element in brown).

93. As shown above, bottom part 5 (i.e., the recited “spacer block”) does not extend into mounting groove 2.⁶⁰

94. Thus, Kitaura discloses “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove,” as claimed.

⁶⁰ This is true whether the recited “spacer block” is bottom part 5 only, as shown, or if it includes portions of rising faces 6 and 7 as described in the alternative discussed above with respect to Claim 17[a]. See *supra*. Section XI.A.2.

7. Claim 17[f]: “the grip element configured to receive a fastener through at least a portion of the grip element”

95. *Kitaura* discloses “the grip element configured to receive a fastener through at least a portion of the grip element.”

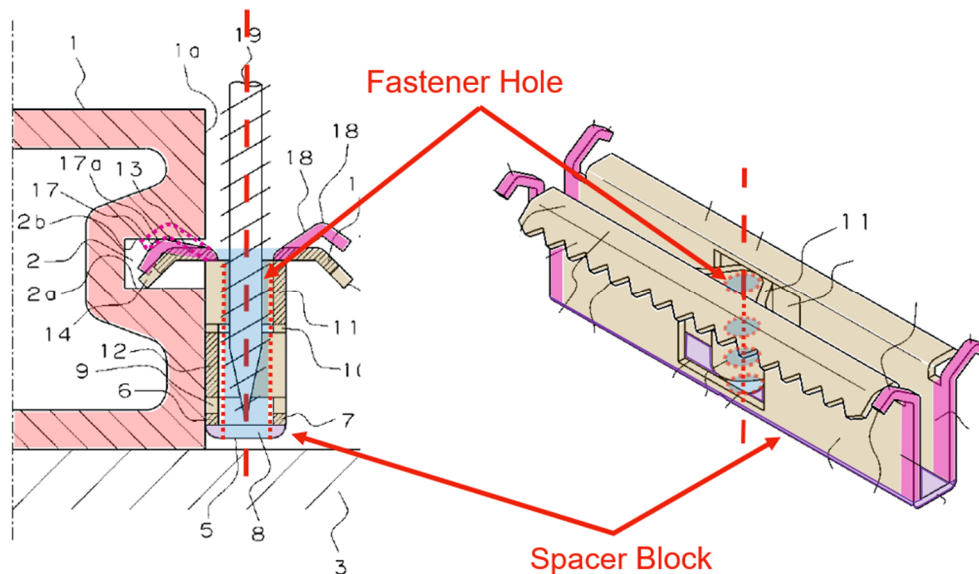


Figure 26. Kitaura Figs. 15 and 19 disclose that at least a portion of its grip element (shaded green) is configured to receive a fastening screw, thereby disclosing claim element 17[f].

96. For example, *Kitaura* describes that “... *the screw 19 is inserted (between the inner surface of the first screw-supporting part 11 and the inner surface of the second screw-supporting part 12 and into the screw insertion hole 8).*”⁶¹ *Kitaura* also describes that “[t]he screw insertion hole 8, the first screw-supporting part 11, and the second screw-supporting part 12 are arranged

⁶¹ EX. 1004, [0042].

coaxially.”⁶² The spatial relationship of these components is shown below in the annotated FIG. 15 from *Kitaura*.

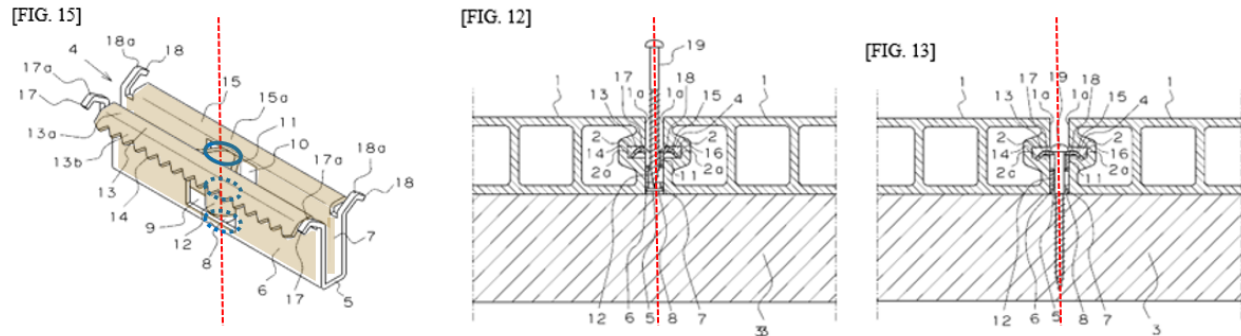


Figure 27. Kitaura’s FIGs. 12, 13 and 15 annotated to show the grip element in brown, the vertical axis as a red dashed line, and the coaxial characteristic of screw insertion hole 8, the first screw-supporting part 11, and the second screw-supporting part 12 in blue.

97. As shown above, first screw-supporting part 11 and the second screw-supporting part 12 (part of the recited “grip element” as discussed above), are formed as part of the “grip element” of *Kitaura*, and configured to receive a screw 19 (*i.e.*, the recited fastener) as it passes through the mounting bracket 4 along the vertical axis described above (shown as a red dashed line) and into supporting member 3 (via screw insertion hole 8). FIG. 8 of *Kitaura* further confirms first screw-supporting part 11 and second screw-supporting part 12 are part of the recited “grip element” at

⁶² EX. 1004, [0029].

least because screw-supporting part 11 is coupled with first rising face 6 and screw-supporting part 12 is coupled with second rising face 7:

[FIG. 8]

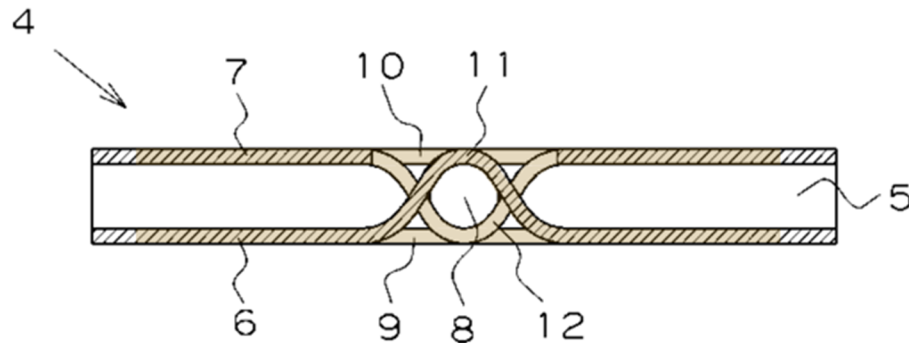


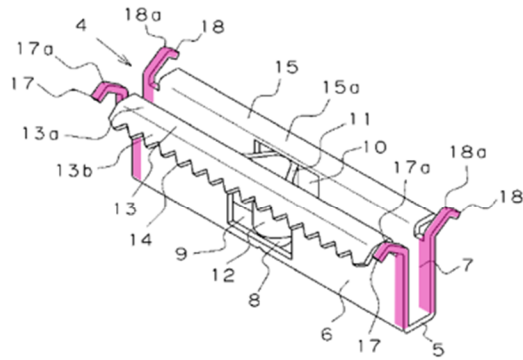
Figure 28. Kitaura's FIG. 8 annotated to show the recited "grip element" in brown.

98. Thus, Kitaura discloses "the grip element configured to receive a fastener through at least a portion of the grip element," as claimed.

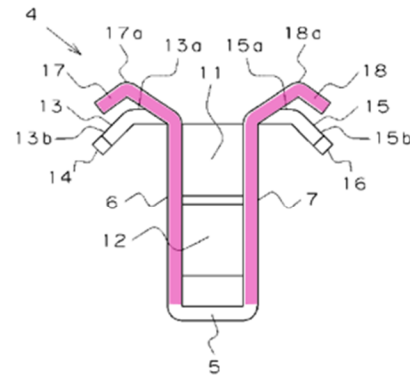
8. Claim 17[g]: "wherein the spacer block includes a first resilient compression element extending from the spacer block,"

99. Kitaura discloses "wherein the spacer block includes a first resilient compression element extending from the spacer block."

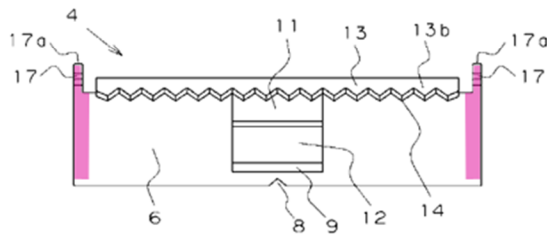
【図 15】



【図 17】



【図 16】



【図 18】

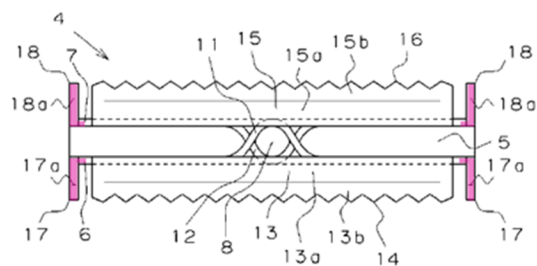


Figure 29. Kitaura FIGs. 15-18 disclose resilient compression elements in pink extending from the bottom portion 5 (spacer block).

100. For example, Kitaura describes:

*In the present example, moreover, the **pair of first temporary fastening protrusions 17** extend elongatedly from the two upper ends **of the first rising face 6** toward the same side as the first fastening part 13, comprise **bends 17a** from an upward diagonal direction to a downward diagonal direction in their middles, and have free distal ends, and the greater part thereof, including the **bends 17a**, projects above the first fastening part 13 when no external force is acting thereupon. Similarly, the **pair of second temporary fastening protrusions 18** extend elongatedly*

*from both upper ends of the **second rising face 7** to the same side as the second fastening part, comprise **bends 18a** from the upward diagonal direction to the downward diagonal direction in the middle, and have free distal ends, and the greater part thereof, including the **bends 18a**, projects above the second fastening part 15 when no external force is acting thereupon.*⁶³

101. A POSITA would have understood that “first temporary fastening protrusions 17,” “second temporary fastening protrusions 18,” “bends 17a,” “bends 18a,” portions of “first rising face 6,” and portions of “second rising face 7” are the recited “resilient compression element[s].” The spatial relationship of these elements is shown below in the annotated FIG. 15 from *Kitaura*.

⁶³ EX. 1004, [0052].

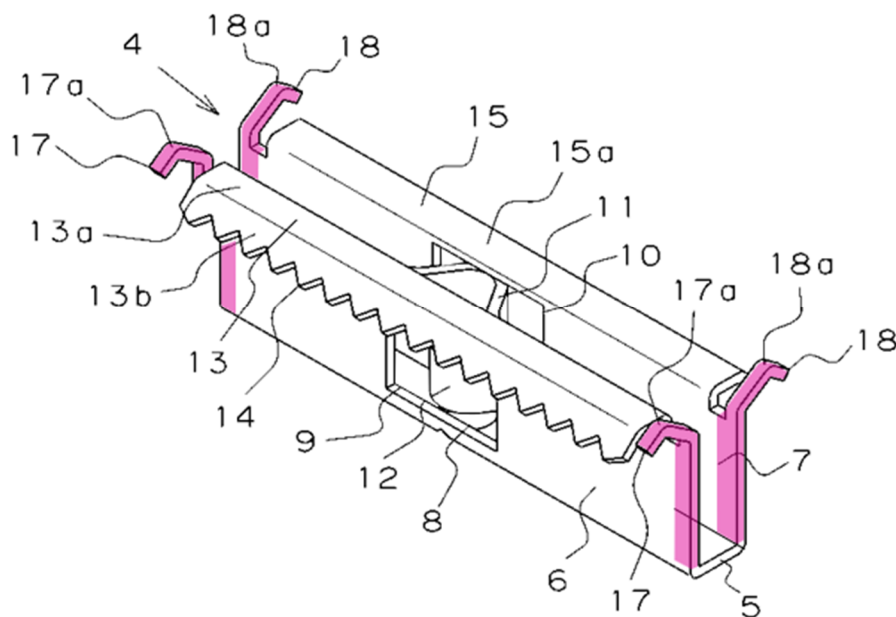


Figure 30. Kitaura's FIG. 15 annotated to show "first temporary fastening protrusions 17," "second temporary fastening protrusions 18," "bends 17a," "bends 18a," portions of "first rising face 6," and portions of "second rising face 7" in pink.

102. Additionally, a POSITA would have understood that the elements forming the recited "resilient compression element" extend from bottom part 5 (*i.e.*, the recited "spacer block") as shown below in the annotated FIG. 15 from *Kitaura*.⁶⁴

⁶⁴ This is true whether the recited "spacer block" is bottom part 5 only, as shown, or if it includes portions of rising faces 6 and 7 as described in the alternative discussed above with respect to Claim 17[a]. See *supra*. Section XI.A.2.

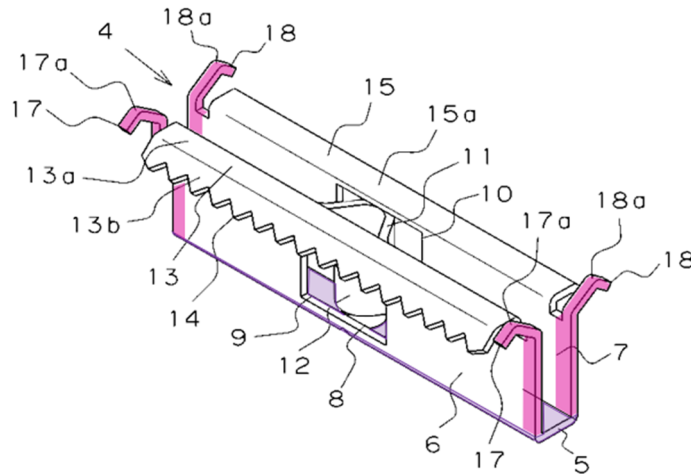


Figure 31. Kitaura's FIG. 15 annotated to show "first temporary fastening protrusions 17," "second temporary fastening protrusions 18," "bends 17a," "bends 18a," portions of "first rising face 6," and portions of "second rising face 7" in pink, and bottom part 5 in purple.

103. As shown, the portions of rising faces 6 and 7 directly under the first and second temporary fastening protrusions 17 and 18 (*i.e.*, collectively the recited "resilient compression element[s]") extend from bottom part 5 (*i.e.*, the recited "spacer block").

104. A POSITA would have understood that the portions of rising faces 6 and 7 directly under the first and second temporary fastening protrusions 17 and 18 are part of the recited "resilient compressions element[s]" at least because *Kitaura* describes "the pair of first temporary fastening protrusions 17 extend elongatedly from the two upper ends of the first rising face 6," and that "the pair of second temporary fastening protrusions 18 extend elongatedly from both upper ends of the second rising face 7" and that "the pairs formed by the first temporary fastening

protrusion 17 and the second temporary fastening protrusion 18 are stamped from a single sheet of metal along with the other constituent elements.”⁶⁵

105. A POSITA would have distinguished the portions of rising faces 6 and 7 that are part of the recited “resilient compressions element[s]” from the portions of rising faces 6 and 7 that form the recited “grip element” at least because *Kitaura* delineates between the two by providing a notch between the two portions. For example, the spatial relationship between the two portions is shown below in the excerpted and annotated FIG. 15 from *Kitaura*.⁶⁶

⁶⁵ EX. 1004, [0052].

⁶⁶ A POSITA would have understood that the delineation discussed below may be applied at different locations within the notch. For example, a POSITA would have understood the delineation of the notch could be in the middle of the notch, the near-side of the notch, or the far side of the notch.

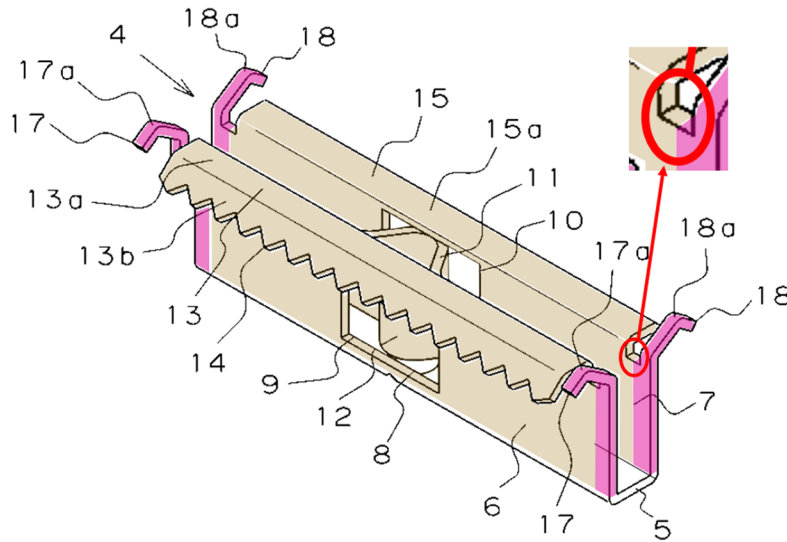


Figure 32. Kitaura's FIG. 15 excerpted and annotated to show the notch circled in red that delineates the portions of rising face 7 that are part of the recited "grip element" in brown from the portions of rising face 7 that are part of the recited "resilient compression element" in pink.

106. A POSITA would have understood the notch as providing a natural boundary between the portions of rising faces 6 and 7 that form part of the recited "grip element" and the portions of rising faces 6 and 7 that form part of the recited "resilient compression element."

107. Thus, *Kitaura* discloses "wherein the spacer block includes a first resilient compression element extending from the spacer block," as claimed.

9. Claim 17[h]: "the first resilient compression element being vertically compressible toward a first plane that is transverse to the vertical axis"

108. *Kitaura* discloses "the first resilient compression element being vertically compressible toward a first plane that is transverse to the vertical axis."

For example, *Kitaura* describes:

*When the first fastening part 13 is inserted into the mounting groove 2 in the leading deck board 1 in the present example, as shown in FIG. 19, **the first temporary fastening protrusions 17 are pushed downward and deformed by the upper surfaces 2b of the mounting grooves 2**, and the vicinities of the bends 17a in the first temporary fastening protrusions 17 are pressed against the upper surfaces 2b of the mounting grooves 2 by the elastic restoring force of the first temporary fastening protrusions 17, thus temporarily fastening the deck board mounting bracket 4 in the mounting grooves 2 of the deck boards 1.*⁶⁷

109. The spatial relationship of these elements is shown below in the annotated FIGs. 19 from *Kitaura*.

⁶⁷ EX. 1004, [0054]; *see also id.*, [0056] (“In the present example, the first and second temporary fastening protrusions 17, 18 **readily elastically deform**, thus enabling more reliable temporary fastening effects to be obtained.”), [0057] (describing that the first and second bends 17a and 18a allow the temporary fastening protrusions to “easily be inserted into the mounting grooves 2 in the deck boards 1.”).

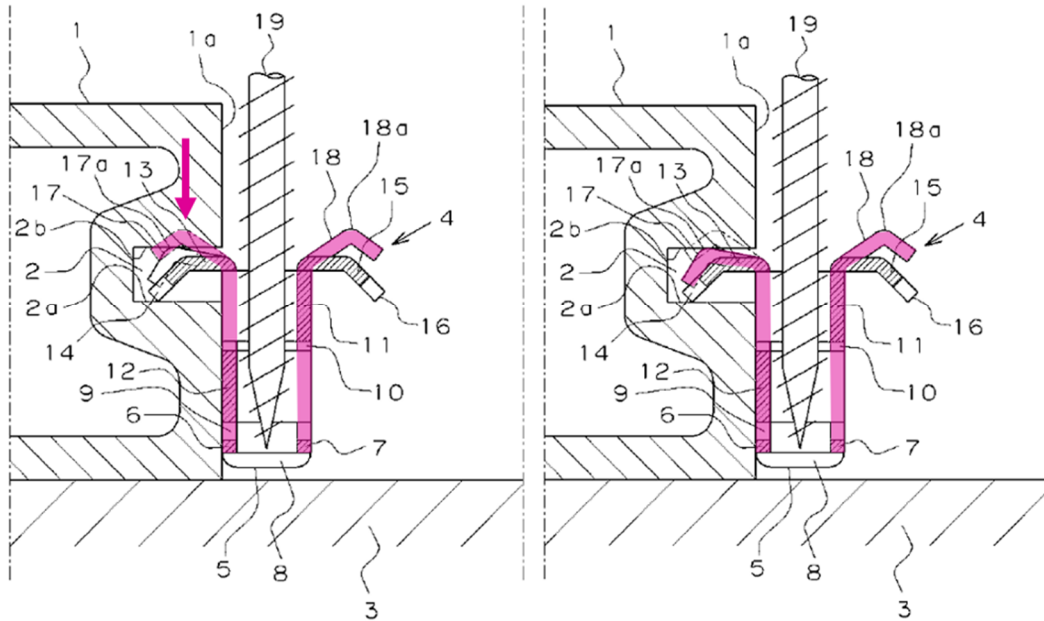


Figure 33. Kitaura's FIG. 19 duplicated and annotated to show movement of Kitaura's resilient compression element.

110. As shown and described in the excerpts from *Kitaura* above, *Kitaura's* resilient compression element is pressed **down** and deformed to fit in mounting groove 2. A POSITA would have understood that moving **down** is towards a (horizontal) plane transverse to the vertical axis identified with respect to Claim 17[c] above. National Nail has asserted that similar movement is “compression” in its Infringement Contentions served in the related litigation:

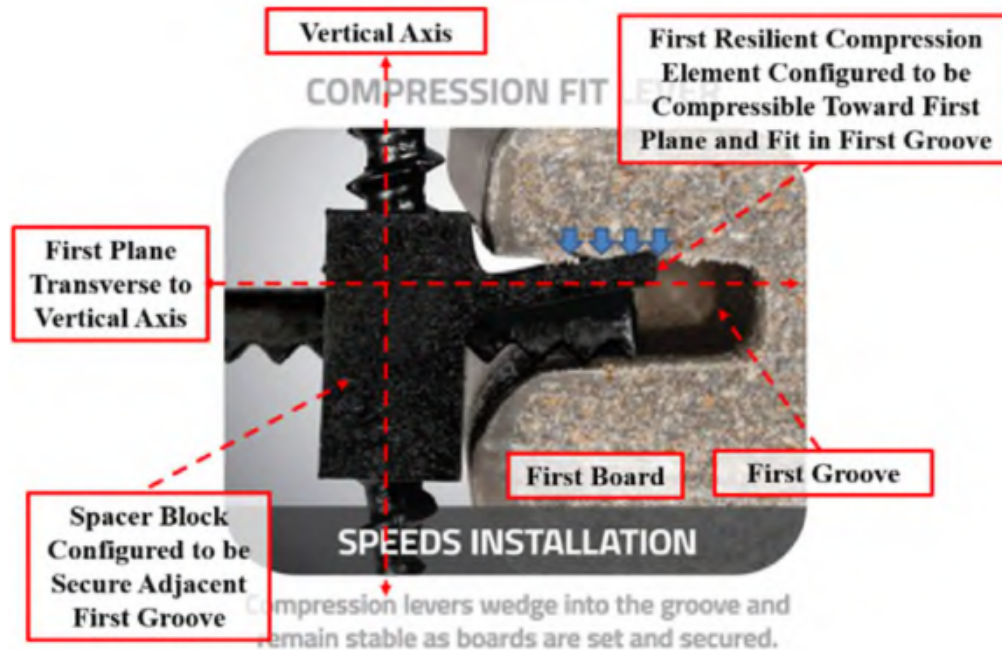


Figure 34. Excerpt from National Nail’s Infringement Contentions in the related litigation where National Nail states that “the first resilient compression element [is] vertically compressible toward a first plane that is transverse to the vertical axis”.⁶⁸

111. Thus, at least under National Nail’s apparent interpretation of the claims, *Kitaura* discloses “the first resilient compression element being vertically compressible toward a first plane that is transverse to the vertical axis,” as claimed.

10. Claim 17[i]: “the first resilient compression element configured to compress and fit in, and forcibly expand within the first groove of the

⁶⁸ EX. 1010, 10.

first board, thereby securing the spacer block in a position adjacent the first groove defined by the first board,”

112. *Kitaura* discloses “the first resilient compression element configured to compress and fit in, and forcibly expand within the first groove of the first board, thereby securing the spacer block in a position adjacent the first groove defined by the first board.” For example, *Kitaura* describes:

*When the first fastening part 13 is inserted into the mounting groove 2 in the leading deck board 1 in the present example, as shown in FIG. 19, the first temporary fastening protrusions 17 are pushed downward and deformed by the upper surfaces 2b of the mounting grooves 2, and the vicinities of the bends 17a in the first temporary fastening protrusions 17 are pressed against the upper surfaces 2b of the mounting grooves 2 by the elastic restoring force of the first temporary fastening protrusions 17, thus temporarily fastening the deck board mounting bracket 4 in the mounting grooves 2 of the deck boards 1.*⁶⁹

⁶⁹ EX. 1004, [0054]; *see also id.*, [0056] (“In the present example, the first and second temporary fastening protrusions 17, 18 ***readily elastically deform***, thus enabling more reliable temporary fastening effects to be obtained.”).

113. The spatial relationship of these elements is shown below in the annotated FIGs. 19 from *Kitaura*.

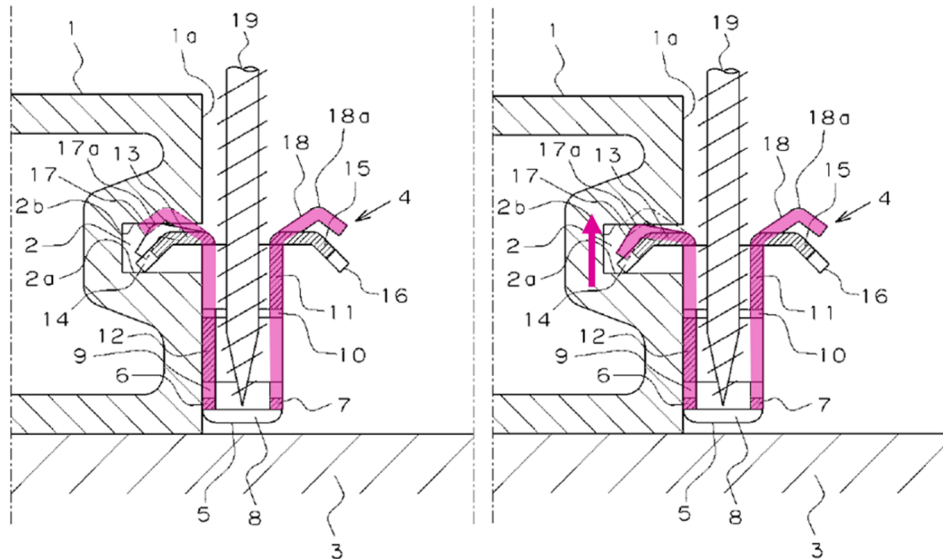


Figure 35. Kitaura's FIG 19 duplicated and annotated to show movement of Kitaura's resilient compression element.

114. As described above with respect to Claim 17[h], *Kitaura's* resilient compression element is pressed **down** and deformed to fit in mounting groove 2. National Nail asserts that similar movement is “compression” in its Infringement Contentions served in the related litigation.⁷⁰ As shown and described, once in mounting groove 2, *Kitaura's* resilient compression element is pressed **up** “against the upper surfaces 2b of the mounting grooves 2 **by the elastic restoring force.**”⁷¹

⁷⁰ See EX. 1010.

⁷¹ EX. 1004, [0054].

National Nail asserts that a similar operation is “expansion” in its Infringement Contentions served in the related litigation:

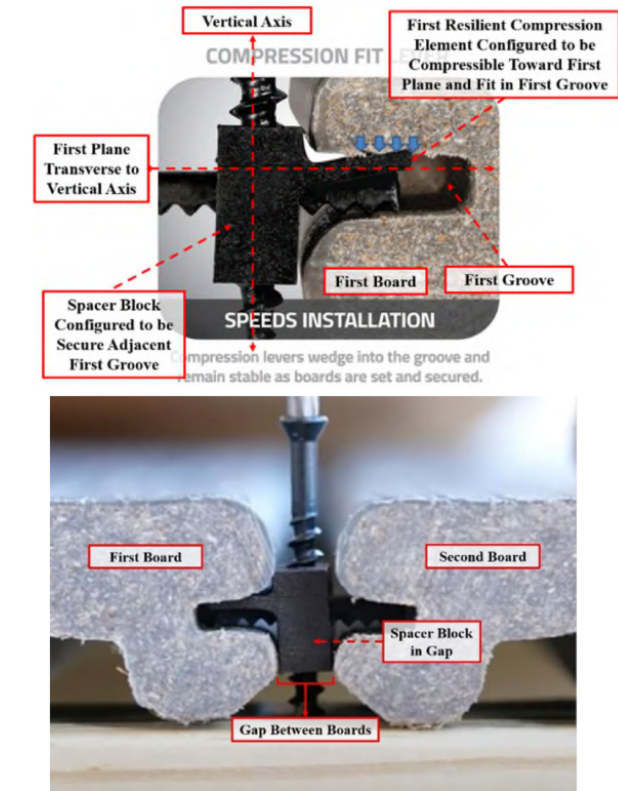


Figure 36. Excerpt from National Nail’s Infringement Contentions in the related litigation where National Nail states that “the first resilient compression element [is] configured to compress and fit in, and forcibly expand within the first groove of the first board, thereby securing the spacer block in a position adjacent the first groove defined by the first board”.⁷²

⁷² EX. 1010, 10.

115. A POSITA would have understood that the operation described above “secur[es] the spacer block in a position adjacent the first groove defined by the first board.” For example, *Kitaura* describes:

*When the first fastening part 13 is inserted into the mounting groove 2 in the leading deck board 1 in the present example, as shown in FIG. 19, the first temporary fastening protrusions 17 are pushed downward and deformed by the upper surfaces 2b of the mounting grooves 2, and the vicinities of the bends 17a in the first temporary fastening protrusions 17 are pressed against the upper surfaces 2b of the mounting grooves 2 by the elastic restoring force of the first temporary fastening protrusions 17, thus temporarily fastening the deck board mounting bracket 4 in the mounting grooves 2 of the deck boards 1.*⁷³

116. In other words, the operation of the temporary fastening protrusions (*i.e.*, the recited resilient compression element) described above suspends bottom part 5 (*i.e.*, the recited “spacer block”) next to (*i.e.*, adjacent to) mounting groove 2 (*i.e.*, the recited “first groove defined by the first board”). This spatial relationship is shown below in the annotated FIG. 19 from *Kitaura*.

⁷³ EX. 1004, [0054].

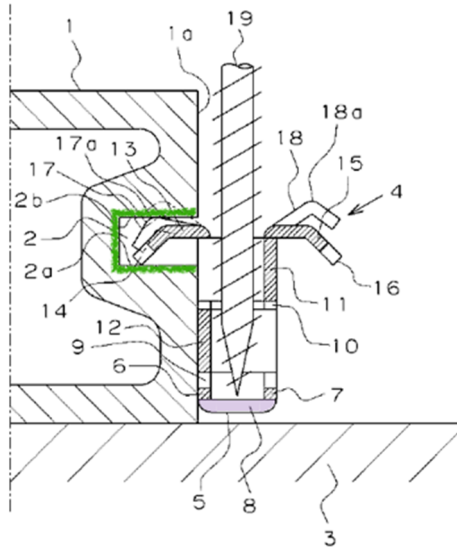


Figure 37. Kitaura's FIG. 19 annotated to show bottom part 5 in purple and mounting groove 2 in green.

117. Thus, at least under National Nail's apparent interpretation of the claims, *Kitaura* discloses "the first resilient compression element configured to compress and fit in, and forcibly expand within the first groove of the first board, thereby securing the spacer block in a position adjacent the first groove defined by the first board," as claimed.

11. Claim 17[j]: "with the spacer block being disposed in the gap between the first board and the second adjacent board."

118. *Kitaura* discloses "with the spacer block being disposed in the gap between the first board and the second adjacent board."

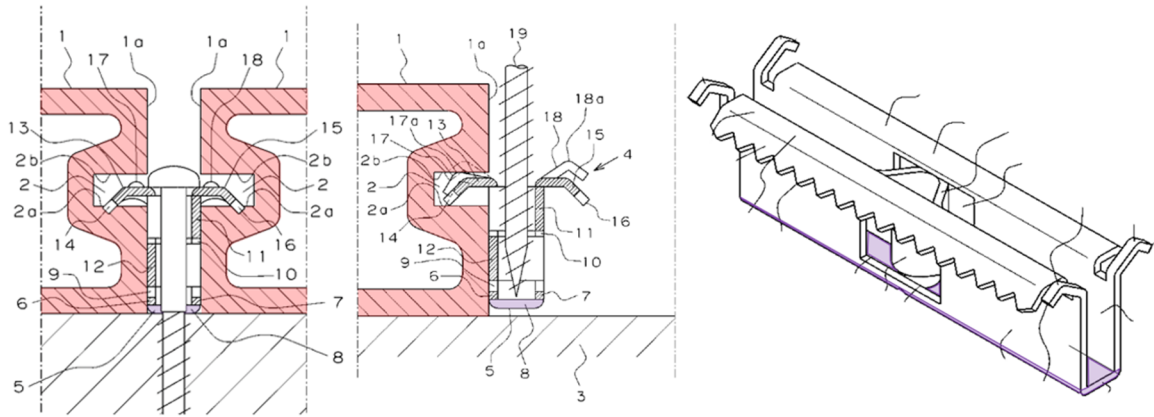


Figure 38. Kitaura Figs. 14, 15, and 19 disclose the spacer block (purple) being disposed in the gap between the first board and the second adjacent board, thus disclosing element 17[j] of '218 Patent claim 17.

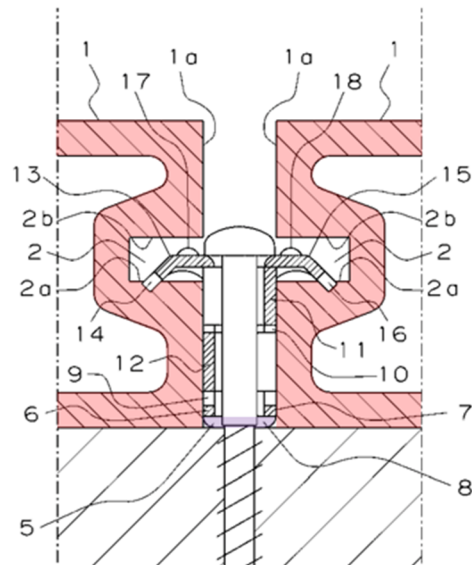


Figure 39. Kitaura's FIG. 14 annotated to show boards 1 (i.e., the recited "first board and adjacent second board") in red and bottom part 5 (i.e., the recited "spacer block") in purple.

119. As shown above, bottom part 5 (*i.e.*, the recited “spacer block”) is disposed between boards 1 (*i.e.*, the recited “first board and adjacent second board”).⁷⁴

120. Thus, *Kitaura* discloses “with the spacer block being disposed in the gap between the first board and the second adjacent board,” as claimed. Based on the preceding analysis, I find that *Kitaura* practices each and every element of ’218 patent claim 17. Moreover, *Kitaura* is prior art to the ’218 patent. Therefore, based on my understanding of the law, *Kitaura* anticipates Claim 17 of the ’218 patent.

B. Grounds 2a and 2b: Obviousness over *Kitaura* in view of *Kinnunen* and/or the Background Knowledge of a POSITA

121. Claim 17 is obvious over *Kitaura* in view of *Kinnunen* and/or in view of the background knowledge of a POSITA for the reasons set forth below. This is true whether the recited “spacer block” is bottom part 5 only, as shown, or if it includes portions of rising faces 6 and 7 as described in the alternative discussed above with respect to Claim 17[a]. *See supra*. Section XI.A.2.

⁷⁴ This is true whether the recited “spacer block” is bottom part 5 only, as shown, or if it includes portions of rising faces 6 and 7 as described in the alternative discussed above with respect to Claim 17[a]. *See supra*. Section XI.A.2.

1. Motivation and Rationale to Combine *Kitaura* and *Kinnunen*

122. It would have been obvious to a POSITA to combine *Kinnunen*'s teaching of a unified grip element with a hole for the fastener with *Kitaura*. This would have predictably resulted in enabling *Kitaura*'s system to cover the exposed space in the mounting bracket of *Kitaura*, thereby inhibiting water and debris from accumulating—reducing the risk of corrosion—and further hiding portions of *Kitaura*'s mounting bracket.

123. A POSITA could have incorporated this teaching of *Kinnunen* into *Kitaura*'s system in several different ways—all of which would provide the benefits described further below. For example, a POSITA could substitute all or a portion of *Kitaura*'s grip element for *Kinnunen*'s grip element.

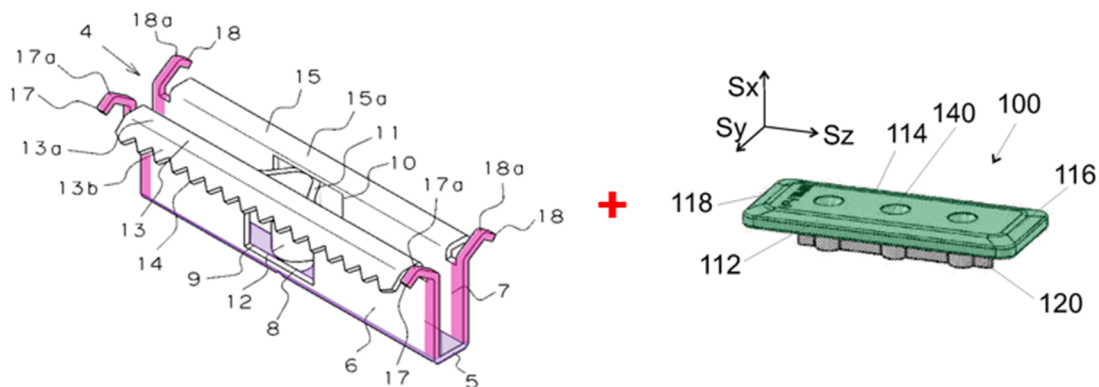


Figure 40. Kitaura's FIG. 15 and Kinnunen's FIG. 4a annotated to show Kitaura's "spacer block" in purple and "resilient compression element[s]" in pink and Kinnunen's grip element in green.

124. As another example, a POSITA could have modified *Kitaura*'s existing grip element to have a unified structure like *Kinnunen*'s.

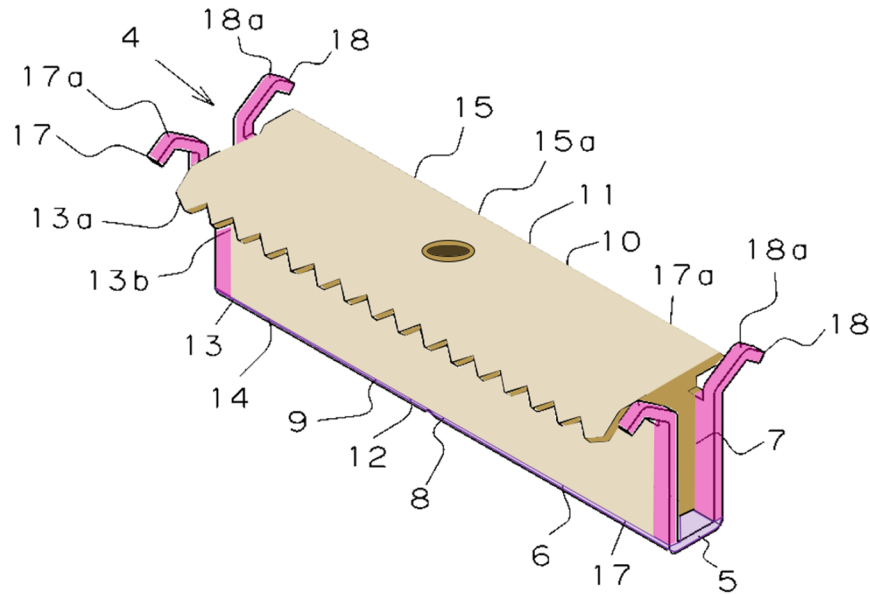


Figure 41. Kitaura's FIG. 15 modified and annotated to show Kitaura's "spacer block" in purple, "resilient compression element[s]" in pink, and "grip element" in brown.

125. As yet another example, a POSITA could have modified Kitaura's system by adding Kinnunen's grip element on-top of Kitaura's existing grip element.

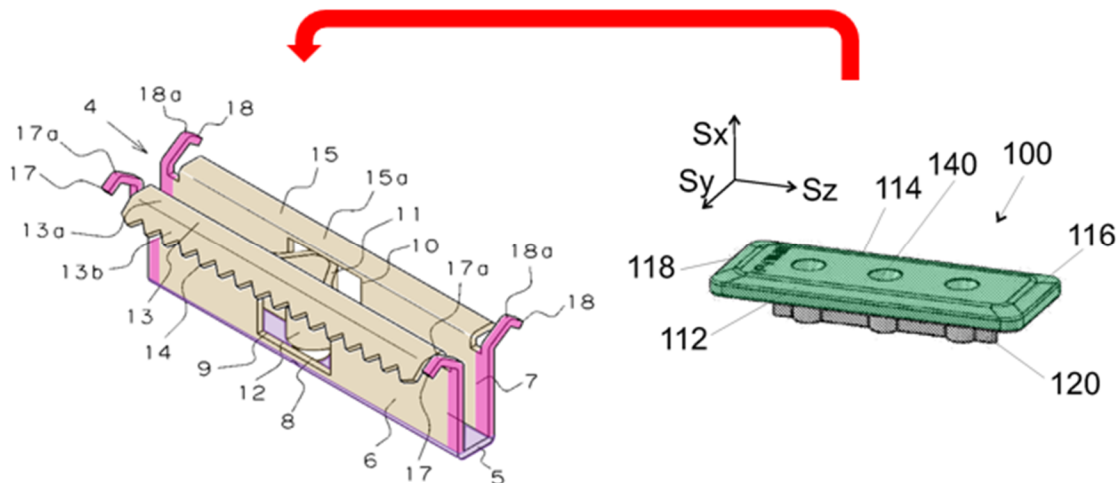


Figure 42. Kitaura's FIG. 15 and Kinnunen's FIG. 4a annotated to show Kitaura's "spacer block" in purple, "resilient compression element[s]" in pink, grip element in brown and Kinnunen's grip element in green (which could be added to Kitaura's grip element).

126. A POSITA would have understood that any of these potential modifications would provide the benefits of *Kinnunen*'s unified grip element structure to the existing system of *Kitaura*.

127. *Kitaura* provides express motivation to combine *Kitaura* with *Kinnunen*. First, *Kitaura* specifically describes a problem where water and debris accumulate between the first and second halves of its deck board mounting bracket leading to a risk of corrosion.⁷⁵ Although *Kitaura* purports to address this problem by "impeding the accumulation of water and debris within the mounting bracket" by increasing the "interval between the first rising face and the second rising face"⁷⁶, a POSITA would have understood that *Kitaura*'s solution does not fully address the stated problem. For example, the inner channel of *Kitaura*'s mounting bracket is still exposed to water. Indeed, a POSITA would have understood that, at least in some scenarios, *Kitaura*'s solution may make the identified problem worse. For example, widening the interval between the first half and the second half of the mounting

⁷⁵ See EX. 1004, [0007] ("resulting in problems such as . . . (b) water and debris readily accumulating between the first half and the second half, creating a risk of corrosion depending on the material of the mounting bracket").

⁷⁶ EX. 1004, [0019] and [0044].

bracket, as proposed in *Kitaura*, may allow for larger pieces of debris to become wedged in the mounting bracket. Such debris may prevent the rising faces 6 and 7 of *Kitaura*'s mounting bracket from absorbing the expansion and/or contraction of the decking boards—a stated design goal in *Kitaura*.⁷⁷ Thus, a POSITA would have been motivated to look for other solutions for inhibiting the accumulation of water and debris while still accommodating the expansion and/or contraction of the decking boards—such as the solution described in *Kinnunen*.

128. Second, *Kitaura* describes another problem where upper parts of the mounting bracket are “visible to individuals above the deck boards, potentially marring appearance.”⁷⁸ *Kitaura* describes that, according to its solution, “first fastening part 13 and the second fastening part 15 are substantially completely hidden in the mounting grooves 2 in the deck boards 1, thus making the mounting bracket 4 less visible to individuals above the deck boards 1 and less likely to mar appearance.”⁷⁹ However, a POSITA would have understood that in *Kitaura*'s solution, bottom part 5 (*i.e.*, the recited “spacer block”) would be visible to

⁷⁷ See EX. 1004, [0009] and [0041].

⁷⁸ See EX. 1004, [0007].

⁷⁹ EX. 1004, [0045].

individuals looking down from above the deck boards. Thus, a POSITA would have been motivated to look for other solutions for hiding more of the mounting bracket—such as the solution described in *Kinnunen*.

129. *Kinnunen* describes a “fastening member 100” with a “first extension 112” connected to “second extension 114” that can be “inserted into a groove.”⁸⁰

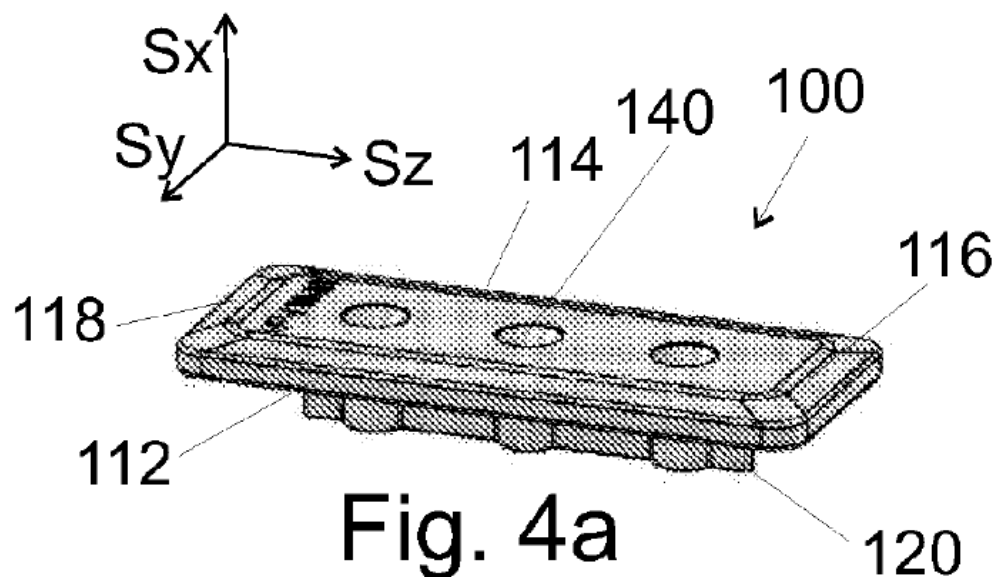
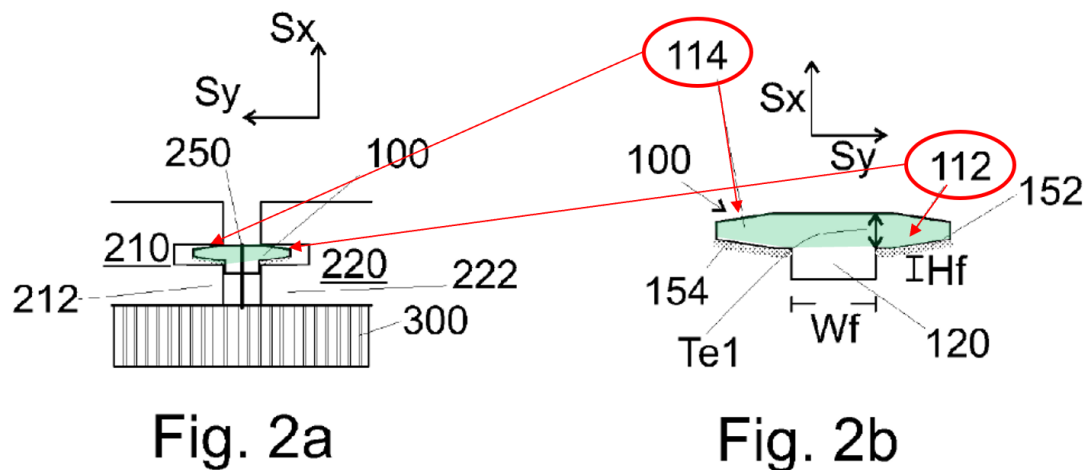


Figure 43. Kitaura's FIG. 4a showing a three-dimensional view of an embodiment of Kinnunen.

130. Like both *Kitaura* and the '218 Patent, *Kinnunen* discloses a grip element. Here, the claimed “grip element” in *Kinnunen* is the disclosed “first

⁸⁰ See EX. 1006, [0090].

extension 112” connected “second extension 114” as explained below in Section XI.B.3.⁸¹ However, as compared to *Kitaura*’s grip element, *Kinnunen*’s first and second extensions 112 and 114 do not leave room for water and debris to collect because of its unified structure.^{82, 83}



⁸¹ See *infra*. Section XI.B.3.

⁸² Although the pictured embodiment includes multiple holes 140, *Kinnunen* describes that there is “at least **one** hole 140.” See *e.g.*, EX. 1006, [0097].

⁸³ See *e.g.*, EX. 1006, [0094]-[0096] (“Referring to FIGS. 1b to 1d, a fastening member 100 comprises **a first extension 112** having a thickness T_e in a first direction S_x and extending in a second direction S_y , wherein the second direction S_y is perpendicular to the first direction S_x , **a second extension 114 connected to the first extension 112** and extending in a direction $-S_y$ that is reverse to the second direction S_y ,...”).

Figure 44. Kinnunen's FIGs 2a and 2b annotated to show first extension 112 and second extension 114 in green forming a unified structure. Additionally, Kinnunen's grip element's unified structure hides Kinnunen's spacer block (foot part 120) when Kinnunen's fastening member is installed.

131. A POSITA would have been motivated to combine *Kitaura* and *Kinnunen* for at least three reasons. First, both references are in the same field of endeavor and directed to solving the same problem as each other and the '218 Patent—systems and methods for mounting deck boards to supports—and are therefore analogous art.⁸⁴

132. Second, as discussed above, a POSITA would have been motivated to modify *Kitaura*'s system to keep water and debris from accumulating in *Kitaura*'s mounting bracket—a problem specifically identified by *Kitaura*.⁸⁵ *Kinnunen*

⁸⁴ See e.g., EX. 1001, 1:6-10; EX. 1004, [0026]; EX. 1006, [0003].

⁸⁵ EX. 1004, [0007] (“problems such as . . . (b) water and debris readily accumulating between the first half and the second half, creating a risk of corrosion depending on the material of the mounting bracket)

describes a similar problem of keeping water from getting into the elements.^{86, 87} As described above, *Kitaura*'s solution to this problem is at best incomplete, thus a POSITA would have looked to a reference like *Kinnunen* for different solutions to its problem. *Kinnunen* more completely addresses the problem identified by *Kitaura* because the unified structure of its grip element acts as a "cap"—inhibiting water and debris from reaching other parts of the fastener unit (referred to as a mounting bracket in *Kitaura*).

133. Third, as discussed above, a POSITA would have been motivated to modify *Kitaura*'s system to hide more of the mounting bracket according to *Kitaura*'s stated design goals. A POSITA would have understood that *Kinnunen*'s unified grip element structure would hide at least bottom part 5 (the recited "spacer

⁸⁶ While *Kinnunen* is referring to deterioration of the elements (*i.e.*, decking boards) due to water, a POSITA would recognize that water would have the same effect on the substructure (*i.e.*, support structure).

⁸⁷ See EX. 1006, [0002] ("The screws, while penetrating through the elements both deteriorate the visual appearance and also provide a leakage for fluids, e.g. water, and moisture to penetrate into the element. This may reduce the service life of the decking board.").

block”) and thus would be an improvement on *Kitaura*’s design. Accordingly, a POSITA would have been motivated to combine *Kinnunen*’s unified grip element structure with *Kitaura*’s mounting bracket.

134. A POSITA would have had a reasonable expectation of success in combining *Kitaura* with *Kinnunen*. As discussed above, *Kitaura* and *Kinnunen* both describe systems for attaching decking boards to supports. Adding *Kinnunen*’s teaching of a unified body grip element to *Kitaura*’s mounting bracket would simply involve, for example, replacing *Kitaura*’s grip element with *Kinnunen*’s, modifying *Kitaura*’s grip element to have a unified structure, or adding *Kinnunen*’s grip element structure on top of *Kitaura*’s existing grip element structure. Examples of these combinations are discussed above. These are simple mechanical changes, any of which would have been well within the capabilities of a POSITA at the time.

135. I discussed recognized rationales for combining prior art in the “Legal Principles” Section above.⁸⁸ Several of these rationales apply to the combination of *Kitaura* and *Kinnunen*. For example, incorporating *Kinnunen*’s grip element into *Kitaura*’s mounting bracket would merely involve “combining prior art elements

⁸⁸ See *supra*. Section IV.

according to known methods to yield predictable results.”⁸⁹ Based on my experience, unified mechanical structures like *Kinnunen*’s grip element were well-known and have a predictable effect of preventing the accumulation of water and debris (for example, a broad example may be a roof on a house or an umbrella—both of which typically have a unified structure)—or hiding what is underneath. *Kinnunen*’s grip element may, additionally or alternatively, be a “simple substitution of one known element for another to obtain predictable results.”⁹⁰ For similar reasons, a POSITA would understand that *Kitaura*’s non-unified grip element structure could be substituted for *Kinnunen*’s unified grip element structure. Doing so would provide the same predictable and desirable result of preventing the accumulation of water and debris and/or hiding what is underneath. Additionally or alternatively, having a unified grip element was a known technique, this is another rationale for combining *Kinnunen* with *Kitaura* is “use of known technique to improve similar devices in the same way.”⁹¹ As discussed above, *Kitaura* and *Kinnunen* are analogous art and

⁸⁹ See *supra*. ¶ 19.

⁹⁰ See *supra*. ¶ 19.

⁹¹ See *supra*. ¶ 19.

Kinnunen's unified grip element solves a similar problem to the one faced by *Kitaura*.

136. *Kinnunen* describes that its grip element may be made of a deformable material.⁹² Thus, a POSITA would have understood that the grip element in the proposed *Kitaura-Kinnunen* combination is made of a deformable material such that it could absorb the expansion and/or contraction of the boards as taught by *Kitaura* while having a unified structure as taught by *Kinnunen*.

2. Claims 17[p]-17[c] and Claims 17[g]-17[j]

137. As described above, *Kitaura* discloses Claims 17[p]-17[c]; Sections XI.A.1-4 are incorporated herein by reference. Additionally, also as described

⁹² See EX. 1006, [0106] (“Preferably, the projection 152 *is deformable*. . . . This can [] be achieved by proper selection of the material of the projection. However, for manufacturing reasons, *preferably the whole fastening member 100 is made of the same material*.”); see also [0206] (“The fastening member may comprise polymer. The fastening member may comprise thermoplastic polymer. Preferably the fastening member 100 comprises polyolefin such as polyethylene, polypropylene, or copolymer thereof. The fastening member may be made of a composite comprising polyolefin and natural fibres.”).

above, *Kitaura* discloses Claims 17[g]-17[j]; Sections XI.A.8-11 are incorporated herein by reference. For at least the reasons described above, a POSITA would have understood that the *Kitaura-Kinnunen* combination discloses Claims 17[p]-17[c] and Claims 17[g]-17[j].

3. Claim 17[d]: “a grip element extending from the spacer block,”

138. As described above, *Kitaura* discloses Claim 17[d]; Sections XI.A.5 is incorporated herein by reference. However, to the extent Patent Owner argues that *Kitaura* alone does not disclose Claim 17[d], the *Kitaura-Kinnunen* combination discloses “a grip element extending from the spacer block,” rendering the claim obvious. For example, *Kinnunen* describes:

Referring to FIGS. 1b to 1d, a fastening member 100 comprises

a first extension 112 having a thickness T_e in a first direction S_x and extending in a second direction S_y , wherein the second direction S_y is perpendicular to the first direction S_x ,

a second extension 114 connected to the first extension 112 and extending in a direction $-S_y$ that is reverse to the second direction S_y ,⁹³

⁹³ EX. 1006, [0094]-[0096].

139. Here, a POSITA would have understood that “first extension 112” connected to “second extension 114” together form the recited “grip element.” The spatial relationship of these elements is shown below in the annotated FIGs. 1a-1d from *Kinnunen*.

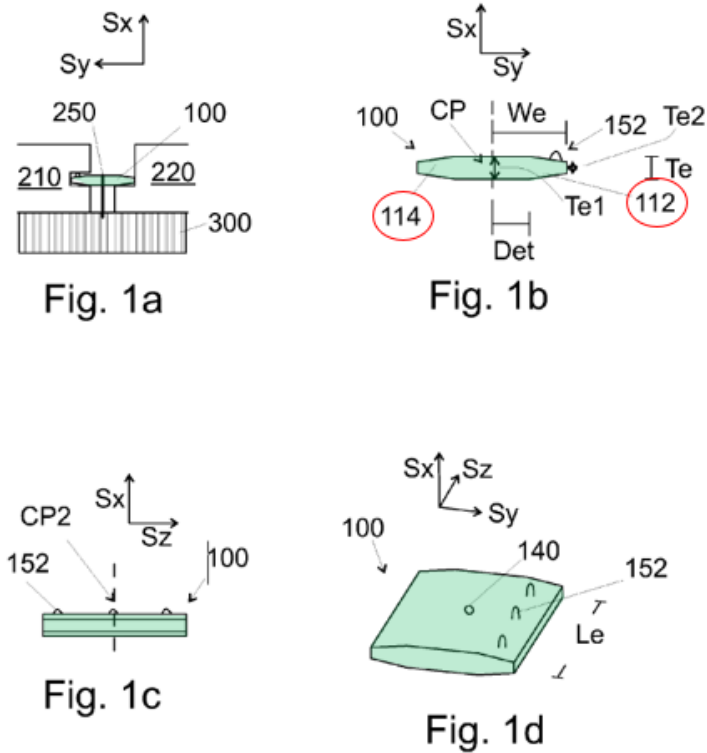


Figure 45. Kinnunen's FIGs. 1a-1d annotated to show first extension 112 and second extension 114 in green.

140. *Kinnunen* also describes an embodiment with a “foot part 120” that is the recited “spacer block.”⁹⁴ The spatial relationship of these elements when a foot part 120 is included is shown below in the annotated FIG. 2b from *Kinnunen*.

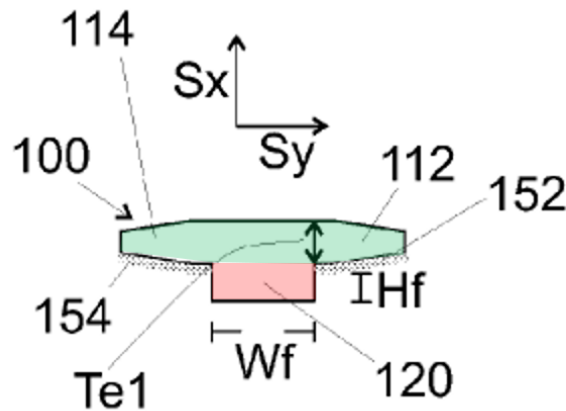


Fig. 2b

Figure 46. Kinnunen’s FIG. 2b annotated to show first extension 112 connected to second extension 114 (i.e., together the recited “grip element”) in green as well as foot part 120 (i.e., the recited “spacer block”) in red.

⁹⁴ See EX. 1006, [0114] (“However, often the depth of the groove (i.e. width of the corresponding tongue in the second direction Sy) varies a lot, whereby the fastening member cannot be used to control the spacing between two elements. For a controlled separation between two elements, the fastening member 100 may be equipped with a *foot part 120*.”).

141. As shown above, first extension 112 connected to second extension 114 (*i.e.*, together the recited “grip element”) extends from foot part 120 (*i.e.*, the recited “spacer block”).

142. A POSITA would have understood first extension 112 connected to second extension 114 as the recited “grip element” at least because they enter the groove of the elements (*e.g.*, adjacent decking boards) and act to secure the elements to a support.⁹⁵

143. A POSITA would have understood foot part 120 as the recited “spacer block” at least because it corresponds with the space between first element 210 and second element 220 (which are the decking boards in *Kinnunen*).⁹⁶ For example,

⁹⁵ See *e.g.*, EX. 1006, [0207] (“Preferably at least the extensions 112 (optionally 114, 116, 118) . . . fix the elements to a support.”); [0127] (“This has the technical effect that either the first extension 112 or the second extension 114 can be inserted into a groove in the described manner.”).

⁹⁶ See *e.g.*, EX. 1006, [0081] (“The element 210, 220 may be *e.g.* panel or a board such as a **decking board** or a railstep board.”).

Kinnunen describes that “[f]or a *controlled separation between two elements*, the fastening member 100 may be equipped with a *foot part 120*.”⁹⁷

144. Thus, the *Kitaura-Kinnunen* combination discloses “a grip element extending from the spacer block,” as claimed. In any of the proposed combinations the grip element is connected to the spacer block—disclosing this element.

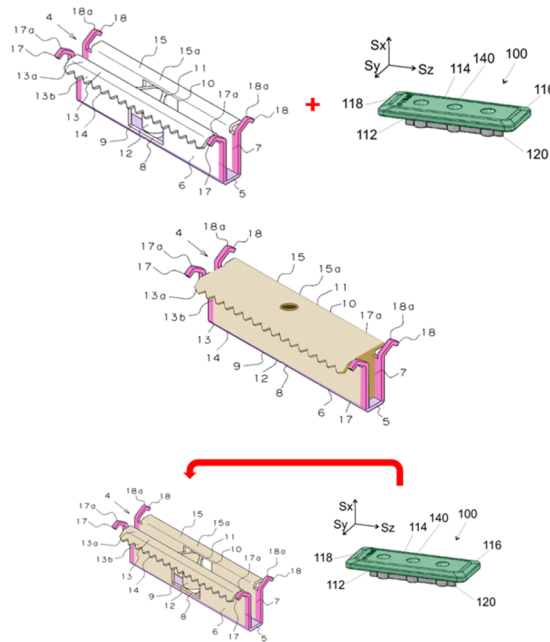


Figure 47. Kitaura’s, FIGs. 15 and Kinnunen’s FIG. 4a excerpted, modified, and annotated showing that in the example combinations discussed above the grip element extends from the spacer block.

145. In addition, it would have been obvious to a POSITA at the time of the ’218 Patent to modify *Kitaura* based on his background knowledge to include “a

⁹⁷ EX. 1006, [0114].

grip element extending from the spacer block.” Indeed, the ’218 Patent concedes this element was known in the art by describing it in its Background (admitted prior art)

Section:

*Some manufacturers have developed hidden fastener systems that fit loosely within grooves of adjacent boards. **These hidden fasteners typically include a biscuit-shaped upper plate having two horizontal flanges that fit into the grooves** defined by the sides of adjacent deck boards, a single center hole through which a fastener extends to secure to the underlying joist, and **a base that extends downward from the upper plate to an underlying joist.***⁹⁸

146. Indeed, in my review of the relevant background I found several examples of this teaching. For example, the Trex Hideaway® Hidden Fastening System was publicly advertised on the Trex website well before the priority date of the ’218 Patent.⁹⁹

⁹⁸ EX. 1001, 1:23-30.

⁹⁹ See EX. 1014 (“Trex Website Background Reference”).



THE UNIVERSAL FASTENER

This self-gapping hardware is the main fastener component that attaches two boards together. It features a stainless steel deck screw already set in the fastener for increased durability and easier installation. Available in versions for Trex Elevations® steel framing or for wood framing.

» 1 box covers 50 sq. ft. (4.6 m²)

» 1 bucket covers 500 sq. ft. (46.5 m²)



Figure 48. Excerpt from the Trex website Background Reference showing “a grip element extending from the spacer block.”

147. It would have been well within the skill of a POSITA at the time of the '218 Patent to implement “a grip element extending from the spacer block” into *Kitaura*’s system—indeed, doing so would merely requiring applying known components in conventional ways to get a predictable result as shown at least by the Trex Website Background Reference. Other rationales for combining the teachings from the background of the prior art may include those described with respect to *Kinnunen* above (the same or similar teachings are proposed to modify *Kitaura*).¹⁰⁰

148. Thus, *Kitaura* combined with the background knowledge of a POSITA renders obvious “a grip element extending from the spacer block,” as claimed.

¹⁰⁰ See *supra*. Section XI.B.1.

4. Claim 17[e]: “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove”

149. As described above, *Kitaura* discloses Claim 17[e]; Sections XI.A.6 is incorporated herein by reference. However, to the extent *Kitaura* alone does not disclose Claim 17[e], the *Kitaura-Kinnunen* combination discloses that “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove.”

150. First, *Kinnunen*’s first extension 112 connected to second extension 114 are “configured to fit in and engage a first groove defined by the first board.” For example, *Kinnunen* describes that “either the first extension 112 or the second extension 114 *can be inserted into a groove* in the described manner.”¹⁰¹ *Kinnunen* also describes that the boards define the grooves. For example, *Kinnunen* repeatedly describes the “grooves” as a “groove of the element 210” and “groove of the element 220.”¹⁰² The spatial relationship of these elements is shown below in the annotated FIG. 2a and 2b from *Kinnunen*.

¹⁰¹ EX. 1006, [0127].

¹⁰² See e.g., EX. 1006, [0081], [0084], [0014].

equipped with a foot part 120.”¹⁰⁴ *Kinnunen* also describes that “the width W_f of the foot part 120 determines the separation of the two elements 210, 220.”¹⁰⁵ A POSITA would have understood that the width of foot part 120 would not determine the separation of the elements if it entered the groove (especially when the depth of the groove is *unknown* as described in the example above). The spatial relationship of these elements is shown below in the annotated FIG. 2a and 2b from *Kinnunen*.

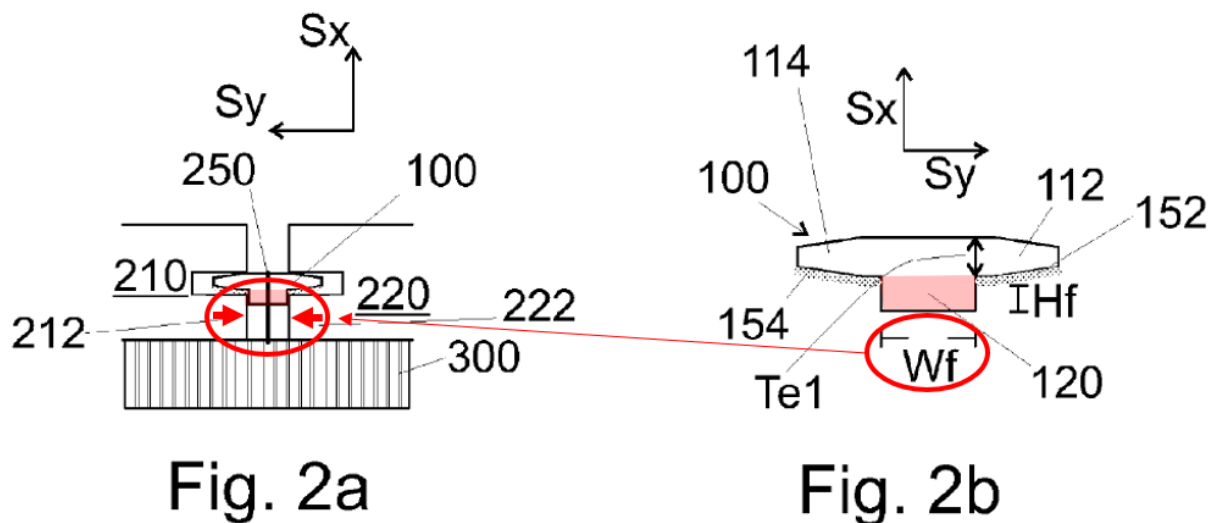


Figure 50. Kinnunen's FIGs 2a and 2b annotated to show foot part 120 in red as well as to show the width, W_f , of the foot part 120 not entering the groove.

¹⁰⁴ EX. 1006, [0114].

¹⁰⁵ EX. 1006, [0117].

152. As discussed above, a POSITA would have understood foot part 120 as the recited “spacer block.”

153. Thus, the *Kitaura-Kinnunen* combination discloses “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove,” as claimed.

154. In addition, it would have been obvious to a POSITA at the time of the ’218 Patent to modify *Kitaura* based on his background knowledge to include “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove.” Indeed, the ’218 Patent concedes at least that “the grip element configured to fit in and engage a first groove defined by the first board” was known in the art by describing it in its Background (admitted prior art) Section:

*Some manufacturers have developed hidden fastener systems that fit loosely within grooves of adjacent boards. These hidden fasteners typically include a **biscuit-shaped upper plate having two horizontal flanges that fit into the grooves defined by the sides of adjacent deck boards**, a single center hole through which a fastener extends to secure to the underlying joist, and a **base that extends***

downward from the upper plate to an underlying joist.^{106,}

107

155. Indeed, in my review of the relevant background I found several examples of this teaching. For example, the Trex Hideaway® Hidden Fastening System was publicly advertised on the Trex website well before the priority date of the '218 Patent.¹⁰⁸

¹⁰⁶ A POSITA would have understood a spacer block that does not enter the groove as the most obvious implementation at least because it is the most direct implementation, avoiding the spacer block entering the groove helps determine a uniform distance between the boards (especially when the depth of the groove is unknown), and because simpler shapes (straight down without entering the groove) are typically easier to manufacture.

¹⁰⁷ EX. 1001, 1:23-30.

¹⁰⁸ See EX. 1014.



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» 1 box covers 50 sq. ft. (4.6 m²)

» 1 bucket covers 500 sq. ft. (46.5 m²)



Figure 51. Excerpt from the Trex website Background Reference showing “a grip element extending from the spacer block.”

156. It would have been well within the skill of a POSITA at the time of the '218 Patent to implement “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove” into *Kitaura*’s system—indeed, doing so would merely requiring applying known components in conventional ways to get a predictable result as shown at least by the Trex Website Background Reference. Other rationales for combining the teachings from the background of the prior art may include those described with respect to *Kinnunen* above (the same or similar teachings are proposed to modify *Kitaura*).¹⁰⁹

¹⁰⁹ See *supra*. Section XI.B.1.

157. Thus, *Kitaura* combined with the background knowledge of a POSITA renders obvious “the grip element configured to fit in and engage a first groove defined by the first board, without the spacer block extending into the first groove,” as claimed.

5. Claim 17[f]: “the grip element configured to receive a fastener through at least a portion of the grip element”

158. The *Kitaura-Kinnunen* combination discloses “the grip element configured to receive a fastener through at least a portion of the grip element.” For example, *Kinnunen* describes that “arrangement (FIG. 2a) comprises a first element 210, a support 300, and a fixing means 250, such as a screw, *wherein the fixing means 250 penetrates through the hole 140 of the fastening means 100* to the support 300.”¹¹⁰ The spatial relationship of these elements—and the relationship of fastening means 100 to first and second extensions 112 and 114—is shown in the annotated FIGs. 2a, 2b, and 4a from *Kinnunen* below.

¹¹⁰ EX. 1006, [0134].

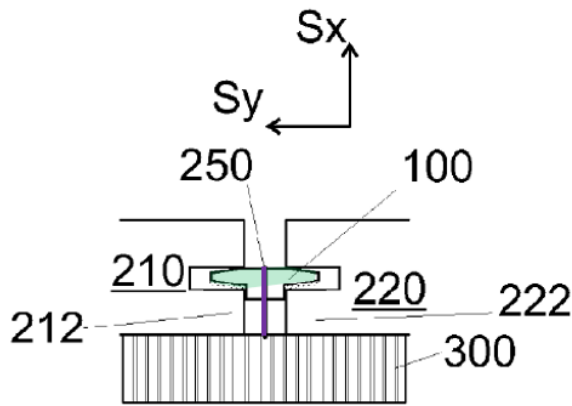


Fig. 2a

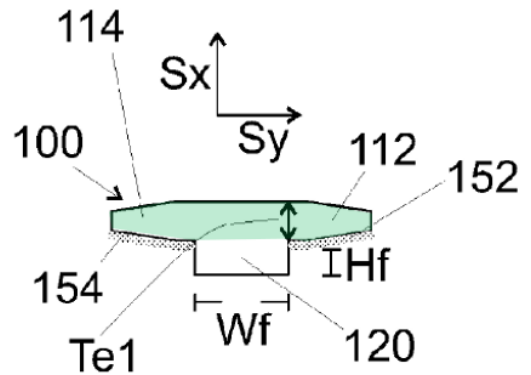


Fig. 2b

Figure 52. Kinnunen's FIG. 2a and 2b annotated to show first extension 112 connected to second extension 114 in green and fixing means 250 in purple.

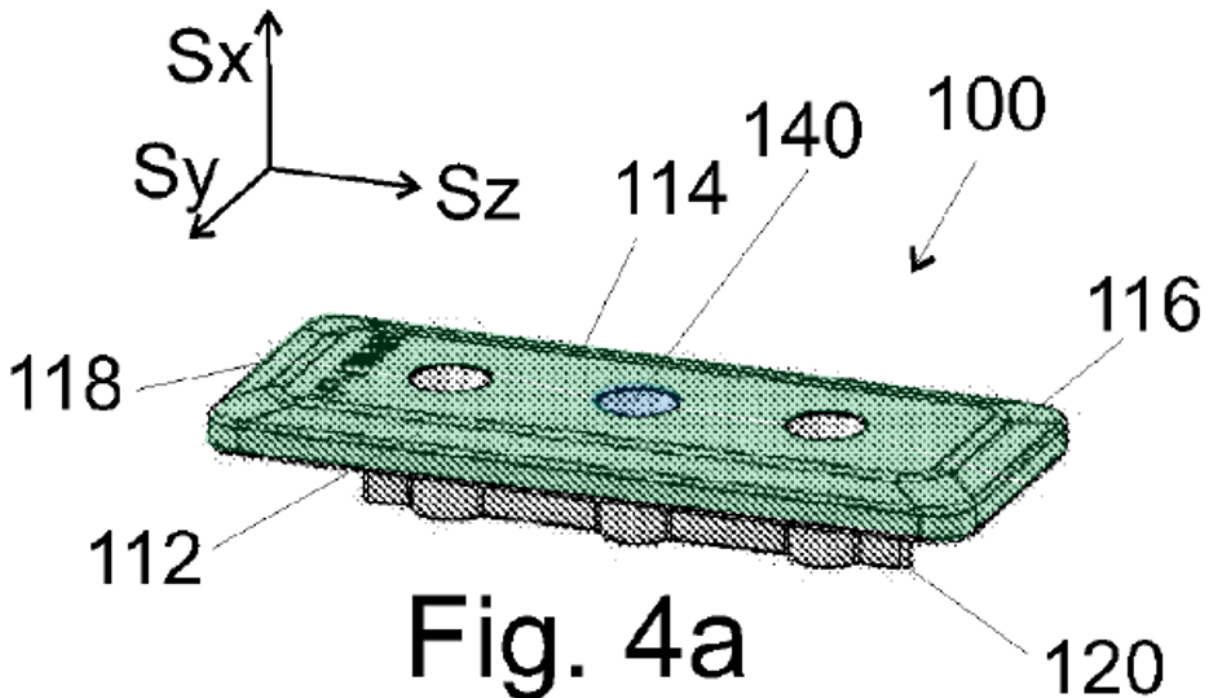


Fig. 4a

Figure 53. Kinnunen's FIG. 4a annotated to show annotated to show first extension 112 connected to second extension 114 in green and hole 140 in blue.

159. As shown and described above, the fixing means 250 (*i.e.*, the recited “fastener”) passes through hole 140 which itself goes through first extension 112 connected to second extension 114 (part of fastening member 100). A POSITA would have understood that hole 140 passes through *Kinnunen*’s “grip element” and thus the grip element is “configured to receive a fastener through at least a portion of the grip element.” For example, as shown and described above, grip element is formed by the first extension 112 connected to the second extension 114 to collectively form a unified structure. The hole 140 (for receiving the faster) passes through that material (first and second extensions 112 and 114). Thus, the hole 140 passes through the grip element and the grip element is configured to receive the fastener.

160. Thus, the *Kitaura-Kinnunen* combination discloses “the grip element configured to receive a fastener through at least a portion of the grip element,” as claimed.

161. Additionally, it would have been obvious to a POSITA at the time of the ’218 Patent to modify *Kitaura* based on his background knowledge to include “the grip element configured to receive a fastener through at least a portion of the grip element.” Indeed, the ’218 Patent concedes this element was known in the art by describing it in its Background (admitted prior art) Section:

*Some manufacturers have developed hidden fastener systems that fit loosely within grooves of adjacent boards. These hidden fasteners typically include a biscuit-shaped upper plate having two horizontal flanges that fit into the grooves defined by the sides of adjacent deck boards, a single center hole through which a fastener extends to secure to the underlying joist, and a base that extends downward from the upper plate to an underlying joist.*¹¹¹

162. Indeed, in my review of the relevant background I found several examples of this teaching. For example, the Trex Hideaway® Hidden Fastening System was publicly advertised on the Trex website well before the priority date of the '218 Patent.¹¹²



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» 1 box covers 50 sq. ft. (4.6 m²)

» 1 bucket covers 500 sq. ft. (46.5 m²)



¹¹¹ EX. 1001, 1:23-30.

¹¹² See EX. 1014.

Figure 54. Excerpt from the Trex website Background Reference showing “the grip element configured to receive a fastener through at least a portion of the grip element.”

163. It would have been well within the skill of a POSITA at the time of the '218 Patent to implement “the grip element configured to receive a fastener through at least a portion of the grip element” into *Kitaura*’s system—indeed, doing so would merely requiring applying known components in conventional ways to get a predictable result as shown at least by the Trex Website Background Reference. Other rationales for combining the teachings from the background of the prior art may include those described with respect to *Kinnunen* above (the same or similar teachings are proposed to modify *Kitaura*).¹¹³

164. Thus, *Kitaura* combined with the background knowledge of a POSITA renders obvious “the grip element configured to receive a fastener through at least a portion of the grip element,” as claimed. Accordingly, for the reasons set forth above, Claim 17 is obvious over *Kitaura* in view of *Kinnunen* and/or in view of the background knowledge of a POSITA.

¹¹³ See *supra*. Section XI.B.1.

XII. CONCLUDING STATEMENTS

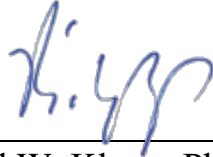
165. In summary, I find that the prior art reference *Kitaura* discloses each and every element of claim 17 of the '218 patent. I also find that a POSITA would find it obvious to combine *Kitaura* in view of *Kinnunen* to arrive at a device that practices each and every element of claim 17 of the '218 patent. Further, I find that a POSITA would find it obvious to combine *Kitaura* with his or her own knowledge, ordinary creativity, and state of the prior art to arrive at a device that practices each and every element of claim 17 of the '218 patent. A POSITA would be motivated by a need expressed in the prior art *Kitaura* reference, namely, to keep dust and dirt out of the fastener area and to hide additional portions of *Kitaura*'s mounting bracket. And motivated by the same considerations, a POSITA could set *Kinnunen* aside and find it obvious to combine *Kitaura* in view of his or her own knowledge.

166. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

167. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that

these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 3 July 2024

By: 
Richard W. Klopp, Ph.D., P.E.