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Attorneys for Plaintiffs Columbia Insurance Co. and MiTek Inc.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

COLUMBIA INSURANCE, CO., and MITEK INC., Plaintiffs, v. SIMPSON STRONG-TIE COMPANY INC., Defendant.	Case No. **COMPLAINT FOR PATENT INFRINGEMENT** **JURY TRIAL REQUESTED**

COMPLAINT

Plaintiffs Columbia Insurance Co. ("Columbia") and MiTek Inc. (f/k/a MiTek USA, Inc.) ("MiTek") (collectively "Plaintiffs"), for their Complaint against Defendant Simpson Strong-Tie Company Inc. ("Simpson"), state as follows:

Parties

1. Plaintiff Columbia is incorporated under the laws of Nebraska having a principal place of business in Omaha, Nebraska.

2. Plaintiff MiTek is incorporated under the laws of Missouri having a principal place of business in Chesterfield, Missouri.

3. Defendant Simpson is incorporated under the laws of California having a principal place of business located at 5956 W. Las Positas Boulevard, Pleasanton, California 94588.

Jurisdiction and Venue

4. This is an action for patent infringement under 35 U.S.C. § 271. The Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

5. The Court has personal jurisdiction over Simpson in that Simpson is a California corporation with its principal place of business located in Pleasanton, California.

6. Venue is proper in this District under 28 U.S.C. §§ 1391(c) and 1400(b) because Simpson has committed acts of infringement and has a regular and established place of business in this District.

Factual Background

7. Simpson and MiTek are direct competitors with both companies offering products across many of the same product segments, especially structural connectors for buildings.

8. One of the most successful recent innovations in structural connectors is MiTek's FWH Series Firewall Hanger (the "FWH Hangers"). The FWH Hangers are unique structural connectors designed to connect a truss or joist to wall framing. Wall framing is typically made from standard components, such as 2X4 or 2X6 wood studs. Wood-framed walls typically include a horizontal top plate formed by one or more of the wood studs, a horizontal bottom plate

or sill formed by one or more of the wood studs, and vertical wood studs spaced apart and extending between and interconnecting the top plate and the sill.

9. The construction industry has used hangers for connecting structural components (e.g., floor joists) to wall structures for over a century.

10. Traditional hangers for connecting trusses and joists to wall framing include a channel-shaped portion configured to receive the structural component and a connection portion configured for attachment to the top plate of a frame wall.

11. Certain structures, such as multi-family residential structures, require fire separation walls between the units (e.g., apartment units, hotel rooms, and condominiums) to prevent or slow the spread of fires across units.

12. Typically, fire retardant sheathing, such as gypsum board, is used along the face of the fire separation wall's wood frame to improve the wall's resistance to fire passing through the wall to the adjacent unit.

13. For example, a typical method of achieving a two-hour fire rating for wall framing in the form of wood-framed walls is to use two layers (a double layer) of 5/8-inch-thick Type-X gypsum wallboard on each side of a wood-framed wall. This double layer of fire retardant sheathing is often required by the building code to be installed on the wood-framed wall from the floor all the way to the next level's subfloor or, for the top level of a structure, to the structure's roof.

14. In using a traditional hanger for connecting a truss or joist to wall framing or a supporting member, the truss or joist is typically butted directly up against the wall framing or supporting member. As a result, cutouts are required in the fire retardant sheathing for the entire cross-sections of the trusses or joists to allow the trusses or joists to be hung from the wall framing.

15. Such cutouts for an entire cross-section of a truss or joist create a large discontinuity in the fire retardant sheathing, thus decreasing the wall's resistance to fire.

16. The novel utility of MiTek's method of constructing a fire-resistive wall assembly using fire wall hangers allows for installation prior to mounting sheathing on the wall, which in

turn allows a building to be completely framed and roofed before the sheathing is installed.

17. The method of constructing a wall assembly with MiTek's fire wall hangers also improves upon the method of traditional hangers with a novel extension that does not require a cutout for the entire cross-section of the joist as part of the installation, yet incredibly maintains the hanger's load capacity.

18. The novelty of the method of constructing a wall assembly with MiTek's fire wall hangers was shown by, among other things, the MiTek FWH Hangers' commercial success and industry praise.

19. The utility of MiTek's method of constructing a fire-resistive wall assembly is protected by the Patent-in-Suit.

Patent-In-Suit

20. On March 5, 2024, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 11,920,339 ("the '339 Patent"), entitled "Method of Constructing a Fire-Resistive Wall Assembly." A copy of the '339 Patent is attached as Exhibit A.

21. The '339 Patent claims the benefit of and priority to Provisional Application No.: 61/922,531, filed December 31, 2013; U.S. Patent Application No. 14/555,049, filed November 26, 2014, now U.S. Patent No. 10,024,049; U.S. Patent Application No. 15/675,409, filed August 11, 2017, now U.S. Patent No. 10,184,242; U.S. Patent Application No. 16/225,517, filed August 11, 2017, filed December 19, 2018, now U.S. Pat. No. 10,316,510; U.S. Patent Application No. 16/433,799, filed June 6, 2019, now U.S. Patent No. 11,021,867; and U.S. Patent Application No. 17/235,349, filed April 20, 2021.

22. Columbia is the owner of the '339 Patent and holds all rights to sue for past, present, and future infringement of the '339 Patent.

23. MiTek is the exclusive licensee of the '339 Patent.

Simpson's Infringement of the '339 Patent

24. The '339 Patent pertains to the method of constructing a fire retardant wall assembly using hangers that are used for connecting structural components (e.g., trusses, joists, or beams) to fire-separation walls.

25. The improved method comprises a novel construction process for mounting, cutting, and installing a fire-resistive wall assembly that allows a building to be completely framed and roofed before fire-resistant sheathing is installed and maintains continuity in the fire wall, which maintains the fire wall's resistance to fire.

26. The '339 Patent contains two independent claims—Claims 1 and 27.

27. Claim 1 recites:

> A method of constructing a fire-resistive wall assembly, the method comprising:
>
> mounting a fire wall hanger on a frame wall, the frame wall including a top plate and a plurality of studs extending down from the top plate, and the fire wall hanger including a channel-shaped portion sized and shaped to receive a structural component, a connection portion configured for attachment to the frame wall and an extension portion interconnecting the channel-shaped portion and the connection portion and spacing the channel-shaped portion from the connection portion, said step of mounting the fire wall hanger includes securing the connection portion of the fire wall hanger to the top plate of the frame wall so that the channel-shaped portion is spaced from the frame wall;
>
> cutting an opening into an exterior edge of fire retardant sheathing, the opening extending through a front face of the fire retardant sheathing and through a rear face of the fire retardant sheathing and opening outwardly from the exterior edge of the fire retardant sheathing; and
>
> after mounting the fire wall hanger on the frame wall and after cutting the opening into the exterior edge of the fire retardant sheathing, installing the fire retardant sheathing with respect to the frame wall so the rear face of the fire retardant sheathing faces toward the studs of the frame wall, said step of installing the fire retardant sheathing includes:
>
> > inserting the fire retardant sheathing between the channel-shaped portion of the fire wall hanger and the frame wall; and
> >
> > moving the fire retardant sheathing relative to the fire wall hanger mounted on the frame wall so that an edge of the fire retardant sheathing bounding the opening moves alongside the extension portion and the fire wall hanger extends through the opening in the fire retardant sheathing.

28. Claim 27 recites:

> A method of constructing a fire-resistive wall assembly, the method comprising:
>
> mounting a fire wall hanger on a frame wall, the frame wall including a top plate and a plurality of studs extending down from the top plate, and the fire wall hanger including a channel-shaped portion sized and shaped to receive a structural component, a connection portion configured for attachment to the frame wall and an extension portion interconnecting the channel-shaped portion and the connection portion and spacing the channel-shaped portion from the connection portion, said step of mounting the fire wall hanger includes securing the connection portion of the fire wall hanger to the top plate of the frame wall so that the channel-shaped portion is spaced from the frame wall;
>
> cutting an opening into an edge of fire retardant sheathing, the opening extending through a front face of the fire retardant sheathing and through a rear face of the fire retardant

sheathing and having an open top opening outwardly from the edge of the fire retardant sheathing; and

after mounting the fire wall hanger on the frame wall and after cutting the opening into the edge of the fire retardant sheathing, installing the fire retardant sheathing with respect to the frame wall so the rear face of the fire retardant sheathing faces toward the studs of the frame wall, said step of installing the fire retardant sheathing includes:

inserting the fire retardant sheathing between the channel-shaped portion of the fire wall hanger and the frame wall; and

arranging the fire retardant sheathing relative to the fire wall hanger so that the fire wall hanger extends through the opening in the fire retardant sheathing and part of the extension portion of the fire wall hanger is received in the opening in the fire retardant sheathing.

29. Simpson has made, used, sold, or offered for sale Strong-Tie Fire Wall Hangers that are adapted for connecting trusses and joist to walls.

30. Simpson's fire wall hangers are designed to connect a structural component to a wall that has two layers of 5/8-inch-thick drywall mounted on it.

31. On information and belief, Simpson's DGT/DGHT Fire Wall Hangers (the "Current DGT Hangers") were designed specifically to practice the innovative method developed by MiTek and claimed in the '339 Patent in order to compete with MiTek's uniquely useful offering in the market.

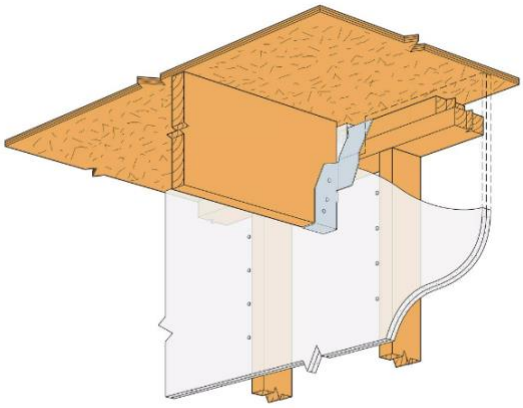
32. Simpson markets and promotes its fire wall hangers to customers and potential customers in various forms, including in product literature published on its website and in print form.

33. Simpson publishes information that directs consumers on the process for constructing a fire-resistive wall assembly.

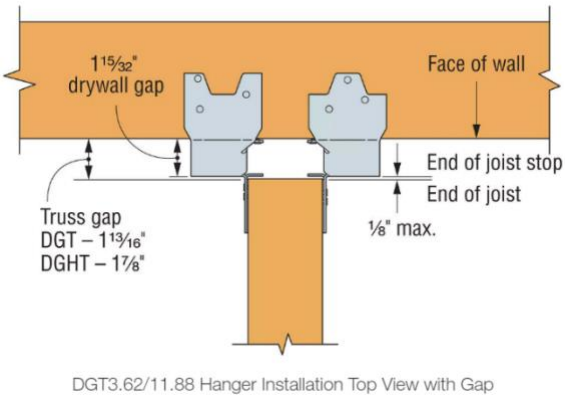
34. For example, in a page on its website, strongtie.com, entitled "Fire Wall Assembly Solutions for Multi-Story Wood Buildings," Simpson instructs consumers that: "The DGT/DGHT fire wall hanger series easily installs on a two-hour wood-stud fire wall (e.g., Type III construction) during framing. These patent-pending, top-flange hangers provide space for two layers of 5/8" gypsum wall board (drywall) to be slipped into place after the framing is complete. The DGT/DGHT fire-rated wall hangers have been tested according to ASTM E814 and received a two-hour fire rating for use on one or both sides of the wall. This rating verifies that

the DGT/DGHT hangers do not reduce the two-hour, fire wall assembly rating. The rating applies to both 2×4 and 2×6 walls." *See* Exhibit B [print-out of strongtie.com/products/go/connectors/firewall-solutions].

35. On the product page for Simpson's DGT Fire Wall Hanger, Simpson advises consumers that this product is "the first fire wall hanger designed to install with a power nailer, saving time before hanging drywall, which helps keep construction projects on schedule. This top-flange hanger provides space for two layers of 5/8" gypsum board (drywall) to be slipped into place after the framing is complete," and displays the following images, among others, for the installation of the hanger:

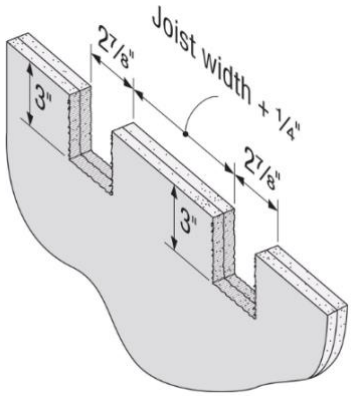


Typical DGT210 Installation



DGT3.62/11.88 Hanger Installation Top View with Gap

36. On the product page for Simpson's DGT Fire Wall Hanger, Simpson advises consumers as to the location and dimensions for cutting openings into an edge of fire retardant sheathing through which the fire wall hanger may extend.



Drywall Notches

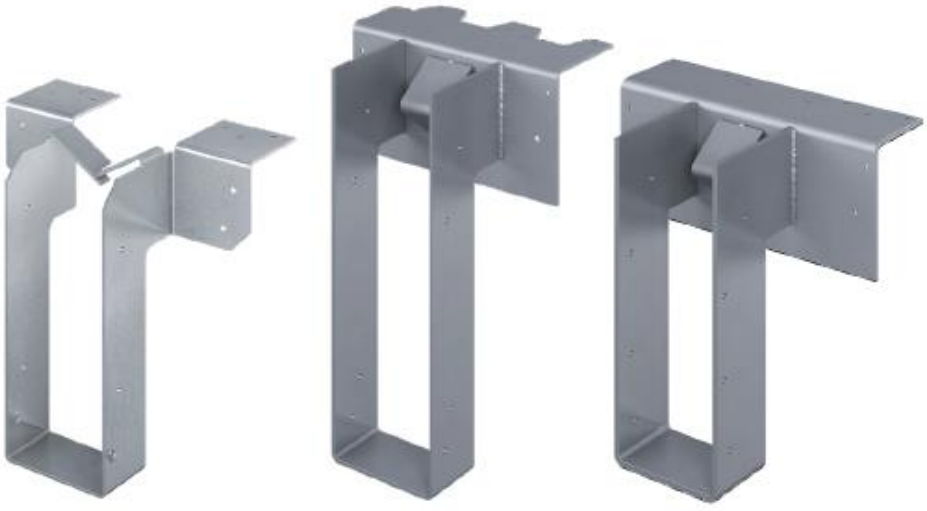
37. The product page for Simpson's DGHT Fire Wall Hanger provides consumers with similar installation information and images, including the following:

Installation

- Use all specified fasteners. I-joists require web stiffeners.
- DGHT is mounted like a standard top-flange hanger.
- Stud wall-plate splices must occur at a stud location.
- DGHT welded to steel header with (4) 3/16" x 1 1/2" fillet welds and (6) joist nails achieves a download of 2,700 lb. Face flanges require full backing.

38. Simpson also publishes additional details in product literature pertaining to its fire wall hangers that encourages consumers to install these connectors practicing a certain method. *See* Exhibits C, D, and E [print-outs of New Fire Wall Hangers Optimized for Power Nailers; DGT DGHT Fire Wall Hangers; and Memo re SST DGT and DGHT Installed without Face Fasteners].

39. On information and belief, Simpson's fire wall hangers are also available in the DGF, DGHF (including skewed versions and offset versions), and DGBF models (collectively the "DGF Series Hanger"). The DGF Series are shown below:



40. Simpson alleges that it began phasing out the DGF Series Hanger following the introduction of its Current DGT Hanger in June 2023.

41. On information and belief, Simpson has continued to make, use, sell, or offer to sell its DGF Series Hanger, including following the issuance of the November 3, 2023 issuance of the Post Grant Review Certificate for the '510 Patent.

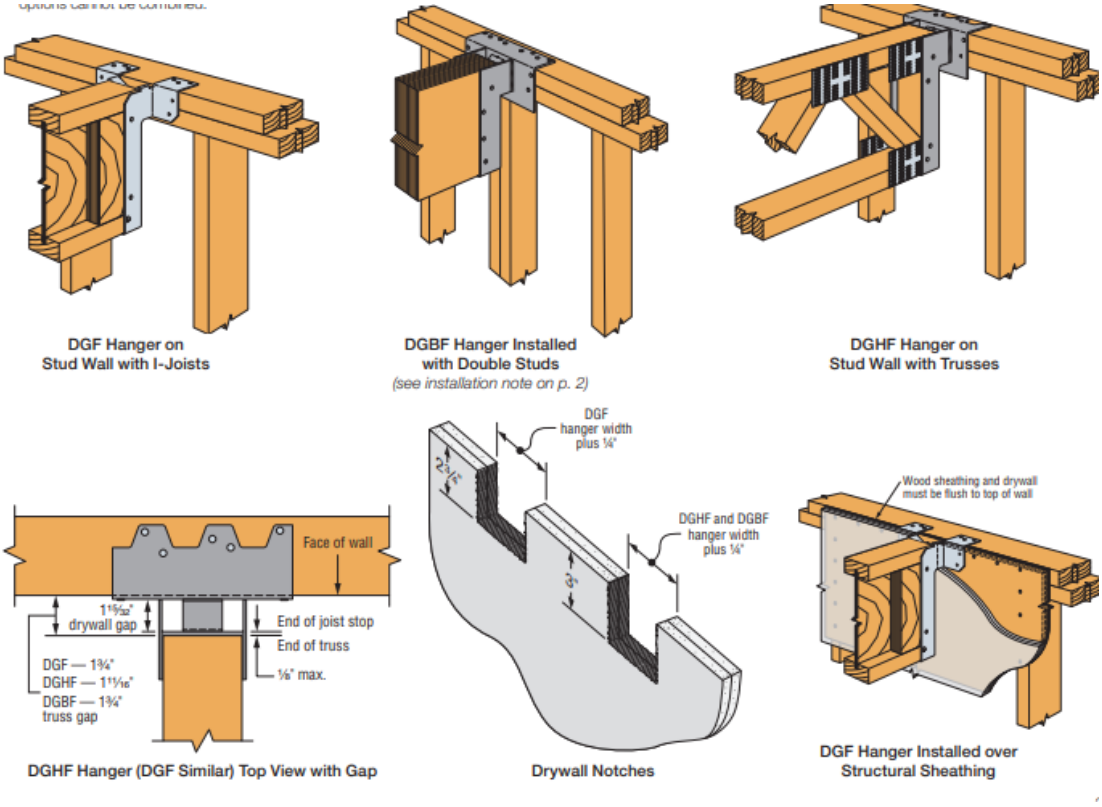
42. In a proposed Updated Joint Case Management Statement & [Proposed] Order Pursuant to Order Re: Case Status provided to Plaintiffs' counsel in a separate litigation, on November 8, 2023, Simpson stated:

> Although Defendant has phased out the DGF product line and replaced it with the DGT product line on the strongtie.com website and in other marketing materials, Defendant informed Plaintiffs on August 11, 2023 that Defendant reserved the right to continue to sell the DGF Series Hangers moving forward and in fact intends to do so. To be more specific, the Accused Products have been specified on engineering plans for multiple projects where the construction has not yet been completed and Defendant understands that it may receive inquiries from prospective customers that wish to purchase and use the DGF, DGHF and/or DGBF. Defendant currently has an inventory of the DGF, DGHF and DGBF products in stock and may sell such products in the future. Defendant also has the capability and materials on hand to manufacture additional DGF Series Hangers should that become necessary.

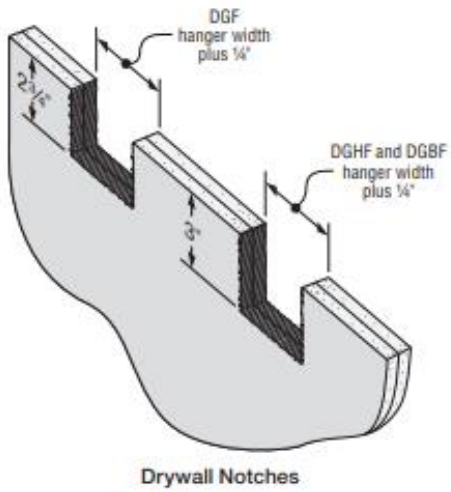
43. On information and belief, Simpson's DGF Series Hanger was designed specifically to practice the innovative method developed by MiTek and claimed in the '339 Patent in order to compete with MiTek's uniquely useful offering in the market.

44. For example, Simpson's product literature pertaining to its DGF Series Hanger instructed consumers that: "[The DGF fire wall hanger is] ideal for multi-family, multi-level building construction and easily installs on a two-hour wood stud fire wall (e.g., Type III construction) during framing. This fire wall series features three models of top-flange hangers that connect floor trusses and joists to wood stud walls. The hangers feature enough space for two layers of 5/8" gypsum board (drywall) to be slipped into place after the framing is complete. The joist hanger gives the completed assembly the ability to function as a two-hour fire-rated wall." *See* Exhibit F.

45. Simpson's product literature pertaining to its DGF Series Hanger displays the following images, among others, for the installation of the hanger:



46. Simpson's product literature pertaining to its DGF Series Hanger advises consumers as to the dimensions for cutting openings into an edge of fire retardant sheathing for the fire wall hanger to extend through:



47. Simpson's conduct specifically encourages consumers to practice the method developed by MiTek and covered by at least Claims 1 and 27 of the '339 Patent.

48. Simpson makes, offers to sell, and sells its fire wall hangers especially for use in a method that infringes at least Claims 1 and 27 of the '339 Patent.

49. Simpson makes, offers to sell, and sells its fire wall hangers with the intent that they be used in a method that infringes the '339 Patent.

50. Simpson's fire wall hangers do not have a substantial non-infringing use outside of use for practicing the method covered by the '339 Patent.

51. Simpson acted with knowledge that its fire wall hangers would be used by consumers to practice the method covered by the '339 Patent.

52. Simpson's conduct infringes, either by inducement or contributorily, at least claim 1 of the '339 Patent.

Simpson's Willful Infringement

53. MiTek released its FWH Hangers in July 2014, which were the subject of a then-pending provisional patent application to which the '339 Patent claims priority.

54. By late 2013, or early 2014, Simpson introduced its DU/DHU/DHUTF Drywall Hangers to the market and promoted them as designed for installation on fire walls over two layers of fire-resistant sheathing.

55. Installation of the DU/DHU/DHUTF Drywall Hangers requires installation of the two layers of fire-resistant sheathing prior to installation of the hanger. This required the sheathing to be installed prior to the building being completely framed and roofed.

56. In contrast to Simpson's DU/DHU/DHUTF Drywall Hangers, MiTek's FWH Hangers allowed for installation prior to mounting sheathing on the wall. This allows the building to be completely framed and roofed before the sheathing is installed.

57. Because of the novel, load-transfer design and utility, MiTek's patented FWH Hangers also achieved substantially higher load ratings than Simpson's DU/DHU/DHUTF Drywall Hangers. This permits the MiTek patented FWH Hangers to be used with longer joist spans.

58. MiTek's FWH Hangers received validation by third party evaluators as complying with code requirements. *See* Exhibit G. MiTek's FWH Hangers were well-received

by customers and municipalities, and MiTek has gained new customers due to the innovative features and functions of its FWH Hangers. Certain municipalities now require hanger products with similar features and functionality as MiTek's patented FWH Hangers.

59. On the other hand, despite being the market share leader for structural connectors, Simpson lost customers for its own fire wall hanger products to MiTek's patented FWH Hangers. In response, Simpson sought to develop a new hanger to compete with MiTek's FWH Hangers.

60. Since MiTek's release of its FWH Hangers, which provided a novel design and method for constructing fire-resistant wall assemblies, Simpson has engaged in a concerted effort to infringe on MiTek's innovation.

61. In discussing the development of a predecessor line of Fire Wall Hanger products, Simpson Vice President, Sam Hensen, testified that:

> Although the DHU Hangers were successful in the market, some Simpson customers requested a firewall hanger that could be installed before the drywall, but which would achieve a fire-resistance rating that was closer to the DHU Hanger. Specifically, scheduling conflicts between framing contractors and drywall contractors arose, requiring drywall contractors to come out before the framing was complete so they could put the drywall in place and then come back later to finish the job once framing was complete. As a result, after the DHU Hangers were developed and released, Simpson worked on the design, development, and testing of the products that were released to the market as the DG/DGB/DGH Fire Wall Hangers.

Exhibit H at ¶ 11.

62. Simpson's DG/DGB/DGH Fire Wall Hangers (the "Predecessor DG Hangers") were developed to compete with MiTek's patented FWH Hangers.

63. Upon information and belief, Simpson copied the novel load-transfer design and utility found in MiTek's FWH Hangers to improve the load capacity of its existing, competing hangers.

64. Upon information and belief, Simpson's Predecessor DG Hangers were released to the market in June 2017.

65. In a letter dated December 19, 2018, Columbia's counsel notified Simpson that the claims of the U.S. Patent Application No. 15/675,409 (the "'409 Application") were allowed

and that Simpson's Predecessor DG Hangers fell within the scope of the allowed claims (U.S. Patent No. 10,184,242 Patent (the "'242 Patent"), which issued on January 22, 2019). *See* Exhibit I.

66. Simpson has been on notice of the '510 Patent since 2019.

67. On April 1, 2019, Simpson released the DGF Series Hanger to the market to replace its Predecessor DG Hangers.

68. In a letter dated May 28, 2019, Columbia's counsel notified Simpson that the claims of the '517 Application had been allowed and that the DGF Series Hanger fell within the scope of the allowed claims (U.S. Patent No. 10,316,510 Patent (the "'510 Patent"), which issued on June 11, 2019). *See* Exhibit J.

69. The May 28, 2019 letter suggested that Simpson "immediately arrange to stop selling and offering for sale the DGF, DGHF and DGBF fire wall hangers by June 11, 2019, as well as any others that infringe [the claims of the '510 Patent that were to issue from the '517 Application]."

70. With full knowledge of the '510 Patent, Simpson failed to modify the DGF Series Hanger and refused to stop infringing MiTek's '510 Patent at that time.

71. As a result, on August 12, 2019, Plaintiffs filed a lawsuit for patent infringement, *Columbia Insurance Company et al. v. Simpson Strong-Tie Company Inc.*, Case No. 3:19-cv-04683-TSH (N.D. Cal.), claiming that the DGF Series Hanger infringed the '510 Patent.

72. The DGF Series Hanger is within the scope of the substitute claim of the '510 Patent.

73. On information and belief, Simpson is aware that the DGF Series Hanger is within the scope of the substitute claim of the '510 Patent.

74. To date, Simpson has never claimed that the DGF Series Hanger is outside of the scope of the '510 Patent.

75. On information and belief, seemingly conceding the validity of MiTek's claims against the DGF Series, Simpson purportedly discontinued sale of said hangers on or around October 2023.

76. On information and belief, on or around October 2023, Simpson released a new line of fire wall hangers—the Current DGT Hangers—to replace the DGF Series Hanger.

77. Simpson's Current DGT Hangers constitute Simpson's latest attempt to copy the design and utility of MiTek's patented FWH Hangers, and on information and belief were designed specifically to practice the innovative method developed by MiTek—and claimed in the '339 Patent—in order to compete with MiTek in the marketplace.

78. On information and belief, Simpson also continues to sell the DGF Series Hanger and continues to instruct customers to use the DGF Series Hanger in a manner which induces infringement of the '339 Patent.

79. On March 5, 2024, the '339 Patent issued. The '339 Patent was filed as a continuation of the patent applications that resulted in the previously-challenged '510.

80. On information and belief, Simpson was monitoring the status and content of the application that resulted in the '339 Patent.

81. On information and belief, Simpson was aware of the claims that issued in the '339 Patent while the application for the '339 Patent was pending.

82. On information and belief, Simpson was aware that the '339 Patent would issue in advance of its March 5, 2024 issuance date.

83. Simpson had actual knowledge of the '339 Patent as of at least March 4, 2024 when counsel for MiTek emailed Simpson's counsel indicating that the '339 Patent would issue on March 5, 2024.

84. Simpson's infringing conduct is within the scope of at least Claims 1 and 27 of the '339 Patent.

85. Simpson was aware that its infringing conduct would be within the scope of claims of the '339 Patent in advance of its March 5, 2024 issuance.

86. Simpson's infringing conduct continued in the market after the March 5, 2024 issue date of the '339 Patent.

87. Simpson's knowledge of the '339 Patent and continued infringing conduct makes its infringement deliberate and intentional.

88. Simpson was aware of MiTek's then-existing patent applications related to its FWH Hangers when it developed its competing Predecessor DG Hangers.

89. Simpson personnel, including its current Vice President Mr. Hensen, receive internet-based news alerts (e.g. Google Alerts) regarding MiTek product offerings and have received such alerts pertaining to MiTek's FWH Hangers and associated intellectual property.

90. Simpson personnel have also utilized non-work e-mail accounts to subscribe to news feeds directly from MiTek so they can receive, in an inconspicuous manner, news alerts related to MiTek's FWH Hangers directly from MiTek.

91. Simpson monitors MiTek patent filings.

92. Simpson has monitored MiTek patent filings for at least the past 8 years.

93. Simpson monitors MiTek patent filings related to MiTek's FWH Hanger product line.

94. Simpson has monitored MiTek patent filings related to MiTek's FWH Hanger product line for at least the past 8 years.

95. Simpson monitored, and was aware of, the pending and allowed claims found in MiTek's FWH Hanger patent filings—including the claims for the '339 Patent—prior to the issuance of that patent.

96. Mr. Hensen acknowledged that "[p]rior to Simpson's release of the DG Hangers, Simpson was aware of MiTek's FWH Hanger and the fact that Plaintiffs had filed a patent application covering the FWH Hanger" and that "[i]n developing the [Predecessor DG Hangers], Simpson was careful to design around Plaintiffs' then-pending patent application, U.S. Pat. Appl. 14/555,049 (the "'049 Application")." Exhibit H at ¶ 14.

97. Simpson's knowledge of the '339 Patent, as well as MiTek's other FWH Hanger patents, tacit concessions of validity, and continued sale of the infringing fire wall hangers designed to be used in a manner that infringes on MiTek's patented design and method makes its infringement deliberate and intentional.

COUNT I

Infringement of U.S. Patent No. 11,920,339

98. Plaintiffs incorporate by reference Paragraphs 1 through 97 above, as if fully set forth herein.

99. Simpson has known of the '339 Patent since no later than March 4, 2024.

100. The '339 Patent requires the use of a fire wall hanger as a material aspect of practicing the claims of the '339 Patent.

101. Since knowing of the '339 Patent, Simpson has actively induced infringement of one or more claims of the '339 Patent, including by manufacturing, offering for sale, and selling its fire wall hangers and providing instructions to consumers in the United States that instruct consumers to infringe each and every element of one or more claims of the '339 Patent.

102. Simpson possessed specific intent to induce direct infringement of at least one claim of the '339 Patent by consumers that purchased Simpson's fire wall hangers.

103. Since knowing of the '339 Patent, Simpson has contributed to infringement of one or more claims of the '339 Patent by manufacturing, offering for sale, and selling its fire wall hangers and providing instructions to consumers in order for consumers to infringe on the method disclosed by the '339 Patent.

104. Simpson's fire wall hangers, including the Current DGT Hanger and DGF Series Hangers, are designed for use in fire-resistant wall assemblies and have no substantial non-infringing use.

105. Simpson's fire wall hangers, including the Current DGT Hanger and DGF Series Hangers, are especially made and adapted for use in fire-resistant wall assemblies covered by at least one claim of the '339 Patent.

106. Simpson's fire wall hangers, including the Current DGT Hanger and DGF Series Hangers, are not staple articles or commodities of commerce suitable for substantial non-infringing use.

107. Simpson's fire wall hangers, including the Current DGT Hanger and DGF Series Hangers, would be impractical, inefficient, and inutile for constructing fire-resistant wall

assemblies other than for use with the method covered by the '339 Patent.

108. Simpson has contributed to the infringement of the '339 Patent by selling fire wall hangers, including the Current DGT Hanger and DGF Series Hangers, with installation instructions for use in fire wall assemblies, knowing that the fire wall hangers are especially designed for use in the method covered by one or more of the claims of the '339 Patent and are not a staple article of commerce suitable for substantial non-infringing use.

109. Simpson has indirectly infringed under 35 U.S.C. § 271(b) and/or (c).

110. On information and belief, Simpson's infringement has been knowing and willful.

111. Simpson's infringement and behavior was egregious, wanton, malicious, and in bad faith.

112. On information and belief, Simpson's infringement will continue unless enjoined by the Court.

113. As a direct and proximate result of Simpson's acts of infringement, Plaintiffs have suffered and continue to suffer damages and irreparable harm.

114. Plaintiffs are without an adequate remedy at law and will be irreparably harmed if the Court does not enter an order enjoining Simpson from infringing the '339 Patent.

Prayer for Relief

WHEREFORE, Plaintiffs Columbia and MiTek request that the Court enter judgment for Plaintiffs, and against Defendant Simpson, and respectfully pray that the Court enter an order:

A. Finding that Defendant Simpson have indirectly infringed U.S. Patent No. 11,920,339 under 35 U.S.C. § 271;

B. Finding that Defendant Simpson's infringement has been willful;

C. Enjoining Defendant Simpson and its respective officers, agents, servants, employees, and attorneys, and all of those persons in active concert or participation with any of them from directly or indirectly infringing any claim of U.S. Patent No. 11,920,339;

D. Awarding compensatory damages to Plaintiffs under 35 U.S.C. § 284;

E. Trebling the damage award under 35 U.S.C. § 284;

F. Awarding Plaintiffs pre-judgment and post-judgment interest;

G. Finding this to be an exceptional case under 35 U.S.C. § 285 and awarding Plaintiffs their reasonable attorneys' fees and expenses in this action;

H. Awarding Plaintiffs their costs in this action; and

I. Awarding such other and further relief as the Court deems just and proper.

Jury Demand

Under Rule 38(b) of the Federal Rules of Civil Procedure, Columbia and MiTek demand a trial by jury of all issues so triable.

Dated: March 15, 2024

Respectfully submitted,

By: /s/ Duane H. Mathiowetz

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Exhibit A

US011920339B2

(12) **United States Patent**
Brekke et al.

(10) **Patent No.: US 11,920,339 B2**
(45) **Date of Patent: Mar. 5, 2024**

(54) **METHOD OF CONSTRUCTING A FIRE-RESISTIVE WALL ASSEMBLY**

(71) Applicant: **Columbia Insurance Company**, Omaha, NE (US)

(72) Inventors: **Steven Brekke**, Lakeville, MN (US); **Mark R Rolf**, Fredericksburg, VA (US)

(73) Assignee: **COLUMBIA INSURANCE COMPANY**, Omaha, NE (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **18/112,843**

(22) Filed: **Feb. 22, 2023**

(65) **Prior Publication Data**

US 2023/0193619 A1 Jun. 22, 2023
US 2023/0417043 A2 Dec. 28, 2023

Related U.S. Application Data

(63) Continuation of application No. 17/235,349, filed on Apr. 20, 2021, now Pat. No. 11,649,626, which is a continuation of application No. 16/433,799, filed on Jun. 6, 2019, now Pat. No. 11,021,867, which is a continuation of application No. 16/225,517, filed on Dec. 19, 2018, now Pat. No. 10,316,510, which is a continuation of application No. 15/675,409, filed on Aug. 11, 2017, now Pat. No. 10,184,242, which is a continuation of application No. 14/555,049, filed on Nov. 26, 2014, now Pat. No. 10,024,049.

(60) Provisional application No. 61/922,531, filed on Dec. 31, 2013.

(51) **Int. Cl.**
E04B 1/26 (2006.01)

(52) **U.S. Cl.**
CPC ***E04B 1/2612*** (2013.01)

(58) **Field of Classification Search**
CPC E04B 1/2612
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

414,169 A 10/1889 Reuschel
478,163 A 7/1892 Ehman
537,504 A 4/1895 Van Dorn
(Continued)

FOREIGN PATENT DOCUMENTS

EP 0210744 B1 2/1991
GB 2062058 A 5/1981
(Continued)

OTHER PUBLICATIONS

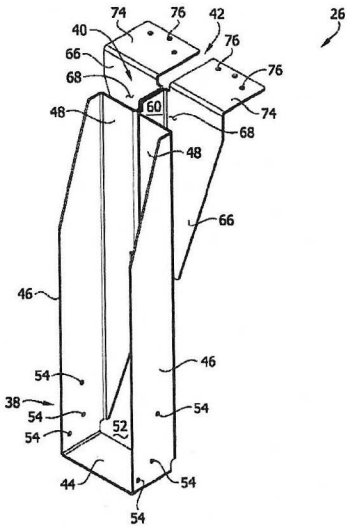
Complaint for Patent Infringement, Case No. 3:19-cv-04683, filed Aug. 12, 2019, pp. 6.
(Continued)

Primary Examiner — James M Ference
(74) *Attorney, Agent, or Firm* — Stinson LLP

(57) **ABSTRACT**

A hanger for connecting a structural component to a wall that can have sheathing mounted thereon either before or after the hanger is connected to the wall. The hanger includes a channel-shaped portion configured to receive the structural component. An extension portion extends from the channel-shaped portion and is configured to extend through the sheathing to engage the wall at a first location. A connection portion is configured for attachment to the wall at a second location spaced from the first location.

31 Claims, 43 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

546,147	A	9/1895	Gregg
598,135	A	2/1898	Butz
625,427	A	5/1899	Stewart et al.
666,918	A	1/1901	Butz
717,316	A	12/1902	Avery
753,053	A	2/1904	Eberhardt
770,050	A	9/1904	Dreyer
783,807	A	2/1905	Tuteur
796,433	A	8/1905	Kahn
804,451	A	11/1905	Carlson
828,488	A	8/1906	Lanz
874,514	A	12/1907	Lindow
922,215	A	5/1909	Tuteur
924,842	A	6/1909	Seipp
943,847	A	12/1909	Seipp
1,406,723	A	2/1922	Caldwell
1,728,981	A	9/1929	Ropp
1,792,815	A	2/1931	Chapin
3,088,558	A	5/1963	Dickinson
3,125,785	A	3/1964	Conville
3,298,651	A	1/1967	Passer
3,601,428	A	8/1971	Gilb
3,633,950	A	1/1972	Gilb
3,752,512	A	8/1973	Gilb
3,907,445	A	9/1975	Wendt
3,945,741	A	3/1976	Wendt
3,972,169	A	8/1976	Sheppard, Jr.
4,005,942	A	2/1977	Gilb
4,198,175	A	4/1980	Knepp et al.
4,223,866	A	9/1980	Black
4,230,416	A	10/1980	Gilb
4,261,155	A	4/1981	Gilb
4,353,664	A	10/1982	Gilb
4,411,548	A	10/1983	Tschan
4,422,792	A	12/1983	Gilb
4,423,977	A	1/1984	Gilb
4,472,916	A	9/1984	Krebs
4,480,941	A	11/1984	Gilb et al.
4,560,301	A	12/1985	Gilb
4,584,813	A	4/1986	Hudson
4,594,017	A	6/1986	Hills
4,665,672	A	5/1987	Commins et al.
4,709,527	A	12/1987	Cooley
4,717,279	A	1/1988	Commins
4,827,684	A	5/1989	Allan
4,893,961	A	1/1990	O'Sullivan et al.
4,920,725	A	5/1990	Gore
5,004,369	A	4/1991	Young
5,104,252	A	4/1992	Colonias et al.
5,111,632	A	5/1992	Turner
5,160,211	A	11/1992	Gilb
5,230,198	A	1/1993	Callies
5,217,317	A	6/1993	Young
5,220,766	A	6/1993	Hills, Sr.
5,249,404	A	10/1993	Leek et al.
5,341,619	A	8/1994	Dunagan et al.
5,423,156	A	6/1995	Nellessen, Jr.
5,457,928	A	10/1995	Sahnazarian
5,555,694	A	9/1996	Commins
5,564,248	A	10/1996	Callies
5,603,580	A	2/1997	Leek et al.
5,697,725	A	12/1997	Ballash et al.
5,797,694	A	8/1998	Breivik
5,836,131	A	11/1998	Viola et al.
5,896,721	A	4/1999	Sugiyama
6,131,358	A	10/2000	Wise
6,230,466	B1	5/2001	Pryor
6,272,951	B1	8/2001	Lambson
6,463,711	B1	10/2002	Callies
6,877,291	B2	4/2005	Shamroukh et al.
7,316,098	B1	1/2008	Sackett
7,707,785	B2	5/2010	Lin
7,971,410	B2	7/2011	Jerke
8,387,333	B2	3/2013	Brekke
8,677,718	B2	3/2014	Marshall
8,720,155	B1	5/2014	Robell
9,206,594	B1	12/2015	Grevious et al.
9,228,338	B2	1/2016	Lin
9,290,926	B2	3/2016	Sidhu
9,394,680	B2	7/2016	Bundy et al.
10,214,897	B2	2/2019	Tan
2001/0054270	A1	12/2001	Rice
2002/0078656	A1	6/2002	Leek et al.
2004/0096269	A1	5/2004	Shahnazarian
2004/0129845	A1	7/2004	Whale et al.
2005/0120669	A1	6/2005	Harrison
2005/0155307	A1	7/2005	Timony
2006/0081743	A1	4/2006	Evans et al.
2006/0156682	A1	7/2006	McAndrew et al.
2006/0191233	A1	8/2006	Tamlyn
2007/0011959	A1	1/2007	DeBene
2007/0119108	A1	5/2007	Downard
2007/0294979	A1	12/2007	Lin et al.
2008/0101855	A1	5/2008	Lin
2008/0237421	A1	10/2008	Szpotowski
2009/0056268	A1	3/2009	Greenlee et al.
2009/0113839	A1	5/2009	Carr
2010/0031601	A1	2/2010	Lin
2011/0146173	A1	6/2011	Visser
2012/0222382	A1	9/2012	Brekke
2012/0297724	A1	11/2012	Pope et al.
2013/0067850	A1	3/2013	Sasanecki
2013/0232758	A1	9/2013	Pond
2014/0338282	A1	11/2014	Sidhu
2015/0059259	A1	3/2015	Hatzinikolas
2015/0167291	A1	6/2015	Bundy et al.
2015/0184370	A1	7/2015	Brekke et al.
2015/0218832	A1	8/2015	Peters et al.
2017/0321418	A1	11/2017	Tremblay
2023/0193619	A1*	6/2023	Brekke E04B 1/2612 52/708

FOREIGN PATENT DOCUMENTS

GB	2433522	A	6/2007
GB	2451853	A	2/2009
IE	56802		12/1991
JP	H3-14482		3/1991
JP	H0314482	Y2	3/1991
JP	05171718	A	7/1993
JP	H70229225	A	8/1995
JP	D1213894		6/2004
WO	0106068	A1	1/2001
WO	008035098	A2	3/2008
WO	2012060863	A2	5/2012
WO	2013126987	A1	9/2013
WO	2017069993	A1	4/2017

OTHER PUBLICATIONS

Plaintiffs' Notice of Motion and Motion for Preliminary Injunction; Memorandum of Points and Authorities in Support of Motion, Case No. 3:19-cv-04683, filed Aug. 12, 2019, pp. 20.

Installer's Pocket Guide, Simpson Strong-Tie Company, Inc. (2009), pp. 60.

Top-Flange Joist Hangers Installed on Walls Over Wood Structural Panel Sheathing or Drywall, Technical Bulletin, Simpson Strong-Tie Company, Inc. (2013), pp. 2.

S/LBV / S/B and S/BA Hangers, Simpson Strong-Tie Company, Inc. (2010), pp. 1.

Cold-Formed Steel Connectors for Residential and Mid-Rise Construction (C-CFS10), Simpson Strong-Tie Company, Inc. (2010) pp. 76.

Wood Construction Connectors Catalog 2013-2014 (C-2013), Simpson Strong-Tie Company, Inc. pp. 236.

Declaration of Dr. Reynaud Serrette, filed as Exhibit 2001 in Case No. PGR2019-00063 on Dec. 13, 2019, 124 pages.

Curriculum Vitae of Reynaud L. Serrette, Ph.D., filed as Exhibit 2002 in Case No. PGR2019-00063 on Dec. 13, 2019, 15 pages.

American Institute of Timber Construction, Timber Construction Manual, Fourth Edition, 1994, filed as Exhibit 2015 in Case No. PGR2019-00063 on Dec. 13, 2019, 17 pages.

(56) **References Cited**

OTHER PUBLICATIONS

International Code Council, International Building Code, 2012, filed as Exhibit 2016 in Case No. PGR2019-00063 on Dec. 13, 2019, 57 pages.
International Code Council, International Building Code, 2000, filed as Exhibit 2017 in Case No. PGR2019-00063 on Dec. 13, 2019, 60 pages.
MiTek, Fire Wall Hangers FWH Series, Structural Connectors Specification Sheet, 2019, tiled as Exhibit 2018 in Case No. PGR2019-00063 on Dec. 13, 2019, 2 pages.
Simpson Strong-Tie, DU/DHU/DHUTF Drywall Hangers Specification Sheet, filed as Exhibit 2019 in Case No. PGR2019-00063 on Dec. 13, 2019, 7 pages.
ICC-ES Evaluation Report, Mar. 2019, filed as Exhibit 2021 in Case No. PGR2019-00063 on Dec. 13, 2019, 18 pages.
Definition of From, The New Oxford American Dictionary, Second Edition, 2005, filed as Exhibit 2022 in Case No. PGR2019-00063 on Dec. 13, 2019, 4 pages.
Gypsum Association, Gypsum Panel Products Types, Uses, Sizes, and Standards, 2004, filed as Exhibit 2023 in Case No. PGR2019-00063 on Dec. 13, 2019, 2 pages.
PABCO Gypsum, for Those About to Rock PABCO Gypsum Products, filed as Exhibiti 2024 in Case No. PGR2019-00063 on Dec. 13, 2019, 8 pages.
Beall, C., "Fire Ratings of Masonry Walls," 1989, filed as Exhibit 2025 in Case No. PGR2019-00063 on Dec. 13, 2019, 3 pages.
Bilow, D. N., et al., "Fire and Concrete Structures," 2008, filed as Exhibit 2026 in Case No. PGR2019-00063 on Dec. 13, 2019, 10 pages.
Irish Concrete Federation, Comprehensive Fire Protection and Safety with Concrete, Dec. 2007, filed as Exhibit 2027 in Case No. PGR2019-00063 on Dec. 13, 2019, 33 pages.
MontgomeryTownship Department of Planning and Zoning, Basement Finish/Remodel Code, 2009, filed as Exhibit 2028 in Case No. PGR2019-00063 on Dec. 13, 2019, 5 pages.
Township of Hillsborough, Sample Guide for Finish Basement Requirements in Existing One and Two Family Dwellings, Jan. 30, 2012, filed as Exhibit 2029 in Case No. PGR2019-00063 on Dec. 13, 2019, 5 pages.
Lstiburek, J., "Understanding Basements," Building Science Digest 103, filed as Exhibit 2030 in Case No. PGR2019-00063 on Dec. 13, 2019, 18 pages.
Moisture Control in Buildings: The Key Factor in Mold Prevention, 2nd Edition, 2009, filed as Exhibit 2031 in Case No. PGR2019-00063 on Dec. 13, 2019, 67 pages.
U.S. Department of Agriculture, Forest Service, Wood-Frame House Construction, Agriculture Handbook No. 73, Apr. 1975, filed as Exhibit 2032 in Case No. PGR2019-00063 on Dec. 13, 2019, 12 pages.
CEL Consulting, Inc., Testing of Joist Hangers per AC13 "Acceptance Criteria for Joist Hangers and Similar Devices," filed as Exhibit 2033 in Case No. PGR2019-00063 on Dec. 13, 2019, 17 pages.
Patent Owner's Preliminary Response to the Petition for Post Grant Review filed in Case No. PGR2019-00063 on Dec. 13, 2019, 120 pages.
Petitioner Simpson Strong-Tie Company Inc.'s Reply to Patent Owner's Preliminary Response filed in Case No. PGR2019-00063 on Feb. 10, 2020, 9 pages.
Supplemental Declaration of W. Andrew Fennell in Support of Petitioner's Reply to Patent Owner's Preliminary Response filed in Case No. PGR2019-00063 on Feb. 10, 2020, 6 pages.
Minutes of Telephonic Meeting Held on Jan. 30, 2020, filed in Case No. PGR2019-00063 on Jan. 30, 2020, 29 pages.
Order Denying Plaintiffs' Motion for Preliminary Injunction, Case No. 3:19-w-04683, filed Oct. 4, 2019, pp. 20.
Reply in Support of Plaintiffs' Notice of Motion and Motion for Preliminary Injunction; Memorandum of Points and Authorities in Support of Motion, Case No. 3:19-cv-04683, filed Sep. 13, 2019, pp. 18.
Answer, Affirmative Defenses, and Counterclaim to Complaint for Patent Infringement, Case No. 3:19-cv-04683, filed Sep. 3, 2019, pp. 8.
Memorandum of Points and Authorities in Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 31.
Declaration of W. Andrew Fennell in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 91.
Declaration of Sam Hensen in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683 filed Sep. 5, 2019, pp. 8.
Investigation of U.S. Appl. No. 16/225,517, Exhibit A to Declaration of W. Andrew Fennell in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Jun. 3, 2019, pp. 68.
Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 4.
Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit E to Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 30.
Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit F to Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 30.
Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit G to Declaration of Joseph V. Mauch in Support of apposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 32.
Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit H to Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 32.
Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, filed Sep. 5, 2019, pp. 152.
Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, Exhibit 1003 , dated Sep. 5, 2019, pp. 172.
Fire-Rated Assemblies in Commercial Construction, Exhibit 1016 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated May 2014, pp. 106.
Fire Resistance Design Manual Sound Control, Exhibit 1017 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated Jun. 2012, pp. 230.
International Building Code,Exhibit 1018 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated May 2011, pp. 12.
Stainless steel for durability, fire-resistance and safety, Exhibit 1030 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, pp. 8.
Infringement Claim Charts, Exhibit 1031 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated Aug. 2019, pp. 20.
Decision Granting Institution of Post-Grant Review issued in Case No. PGR2019-00063 on Mar. 12, 2020, 63 pages.
Patent Owner's Sur-Reply filed in Case No. PGR2019-00063 on Feb. 20, 2020, 10 pages.
Patent Owner's Corrected Sur-Reply filed in Case No. PGR2019-00063 on Mar. 3, 2020, 9 pages.
Supplemental Declaration of W. Andrew Fennell in Support of Petitioner's Reply to Patent Owner's Preliminary Response filed as Exhibit 1036 in Case No. PGR2019-00063 on Feb. 10, 2020, 6 pages.
Supplemental Declaration of Dr. Reynaud Serrette, filed as Exhibit 2034 in Case No. PGR2019-00063 on Feb. 19, 2020, 5 pages.
Trimber, K. A., et al., "Measuring Moisture in Walls," Interface, Apr. 2012, filed as Exhibit 2035 in Case No. PGR2019-00063 on Feb. 19, 2020, 8 pages.
U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Building Concrete Masonry Homes: Design and Construction Issues, filed as Exhibit 2036 in Case No. PGR2019-00063 on Feb. 19, 2020, 43 pages.

(56) **References Cited**

OTHER PUBLICATIONS

International Code Council, International Building Code, 2012, filed as Exhibit 2016 in Case No. PGR2019-00063 on Dec. 13, 2019, 57 pages.
International Code Council, International Building Code, 2000, filed as Exhibit 2017 in Case No. PGR2019-00063 on Dec. 13, 2019, 60 pages.
MiTek, Fire Wall Hangers FWH Series, Structural Connectors Specification Sheet, 2019, tiled as Exhibit 2018 in Case No. PGR2019-00063 on Dec. 13, 2019, 2 pages.
Simpson Strong-Tie, DU/DHU/DHUTF Drywall Hangers Specification Sheet, filed as Exhibit 2019 in Case No. PGR2019-00063 on Dec. 13, 2019, 7 pages.
ICC-ES Evaluation Report, Mar. 2019, filed as Exhibit 2021 in Case No. PGR2019-00063 on Dec. 13, 2019, 18 pages.
Definition of From, The New Oxford American Dictionary, Second Edition, 2005, filed as Exhibit 2022 in Case No. PGR2019-00063 on Dec. 13, 2019, 4 pages.
Gypsum Association, Gypsum Panel Products Types, Uses, Sizes, and Standards, 2004, filed as Exhibit 2023 in Case No. PGR2019-00063 on Dec. 13, 2019, 2 pages.
PABCO Gypsum, for Those About to Rock PABCO Gypsum Products, filed as Exhibiti 2024 in Case No. PGR2019-00063 on Dec. 13, 2019, 8 pages.
Beall, C., "Fire Ratings of Masonry Walls," 1989, filed as Exhibit 2025 in Case No. PGR2019-00063 on Dec. 13, 2019, 3 pages.
Bilow, D. N., et al., "Fire and Concrete Structures," 2008, filed as Exhibit 2026 in Case No. PGR2019-00063 on Dec. 13, 2019, 10 pages.
Irish Concrete Federation, Comprehensive Fire Protection and Safety with Concrete, Dec. 2007, filed as Exhibit 2027 in Case No. PGR2019-00063 on Dec. 13, 2019, 33 pages.
MontgomeryTownship Department of Planning and Zoning, Basement Finish/Remodel Code, 2009, filed as Exhibit 2028 in Case No. PGR2019-00063 on Dec. 13, 2019, 5 pages.
Township of Hillsborough, Sample Guide for Finish Basement Requirements in Existing One and Two Family Dwellings, Jan. 30, 2012, filed as Exhibit 2029 in Case No. PGR2019-00063 on Dec. 13, 2019, 5 pages.
Lstiburek, J., "Understanding Basements," Building Science Digest 103, filed as Exhibit 2030 in Case No. PGR2019-00063 on Dec. 13, 2019, 18 pages.
Moisture Control in Buildings: The Key Factor in Mold Prevention, 2nd Edition, 2009, filed as Exhibit 2031 in Case No. PGR2019-00063 on Dec. 13, 2019, 67 pages.
U.S. Department of Agriculture, Forest Service, Wood-Frame House Construction, Agriculture Handbook No. 73, Apr. 1975, filed as Exhibit 2032 in Case No. PGR2019-00063 on Dec. 13, 2019, 12 pages.
CEL Consulting, Inc., Testing of Joist Hangers per AC13 "Acceptance Criteria for Joist Hangers and Similar Devices," filed as Exhibit 2033 in Case No. PGR2019-00063 on Dec. 13, 2019, 17 pages.
Patent Owner's Preliminary Response to the Petition for Post Grant Review filed in Case No. PGR2019-00063 on Dec. 13, 2019, 120 pages.
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Minutes of Telephonic Meeting Held on Jan. 30, 2020, filed in Case No. PGR2019-00063 on Jan. 30, 2020, 29 pages.
Order Denying Plaintiffs' Motion for Preliminary Injunction, Case No. 3:19-w-04683, filed Oct. 4, 2019, pp. 20.
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Answer, Affirmative Defenses, and Counterclaim to Complaint for Patent Infringement, Case No. 3:19-cv-04683, filed Sep. 3, 2019, pp. 8.
Memorandum of Points and Authorities in Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 31.
Declaration of W. Andrew Fennell in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 91.
Declaration of Sam Hensen in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683 filed Sep. 5, 2019, pp. 8.
Investigation of U.S. Appl. No. 16/225,517, Exhibit A to Declaration of W. Andrew Fennell in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Jun. 3, 2019, pp. 68.
Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, filed Sep. 5, 2019, pp. 4.
Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit E to Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 30.
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Invalidity Claim Chart, U.S. Pat. No. 10,316,510, Exhibit H to Declaration of Joseph V. Mauch in Support of Opposition to Motion for Preliminary Injunction, Case No. 3:19-cv-04683, dated Sep. 2019, pp. 32.
Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, filed Sep. 5, 2019, pp. 152.
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Fire-Rated Assemblies in Commercial Construction, Exhibit 1016 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated May 2014, pp. 106.
Fire Resistance Design Manual Sound Control, Exhibit 1017 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated Jun. 2012, pp. 230.
International Building Code,Exhibit 1018 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated May 2011, pp. 12.
Stainless steel for durability, fire-resistance and safety, Exhibit 1030 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, pp. 8.
Infringement Claim Charts, Exhibit 1031 to Petition for Post-Grant Review of U.S. Pat. No. 10,316,510, dated Aug. 2019, pp. 20.
Decision Granting Institution of Post-Grant Review issued in Case No. PGR2019-00063 on Mar. 12, 2020, 63 pages.
Patent Owner's Sur-Reply filed in Case No. PGR2019-00063 on Feb. 20, 2020, 10 pages.
Patent Owner's Corrected Sur-Reply filed in Case No. PGR2019-00063 on Mar. 3, 2020, 9 pages.
Supplemental Declaration of W. Andrew Fennell in Support of Petitioner's Reply to Patent Owner's Preliminary Response filed as Exhibit 1036 in Case No. PGR2019-00063 on Feb. 10, 2020, 6 pages.
Supplemental Declaration of Dr. Reynaud Serrette, filed as Exhibit 2034 in Case No. PGR2019-00063 on Feb. 19, 2020, 5 pages.
Trimber, K. A., et al., "Measuring Moisture in Walls," Interface, Apr. 2012, filed as Exhibit 2035 in Case No. PGR2019-00063 on Feb. 19, 2020, 8 pages.
U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Building Concrete Masonry Homes: Design and Construction Issues, filed as Exhibit 2036 in Case No. PGR2019-00063 on Feb. 19, 2020, 43 pages.

(56) **References Cited**

OTHER PUBLICATIONS

CGC Inc., The Gypsum Construction Handbook, Centennial Edition, 2005, filed as Exhibit 2037 in Case No. PGR2019-00063 on Feb. 19, 2020, 34 pages.

Clarkwestern Dietrich Building Systems LLC, Furring Channel/Hat Channel, filed as Exhibit 2038 in Case No. PGR2019-00063 on Feb. 19, 2020, 3 pages.

ASTM International, Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers, Designation: D7147-11, filed as Exhibit 2039 in Case No. PGR2019-00063 on Feb. 19, 2020, 10 pages.

APA, Floor Construction, an Excerpt of the Engineered Wood Construction Guide, Dec. 2019, filed as Exhibit 2040 in Case No. PGR2019-00063 on Feb. 19, 2020, 16 pages.

International Code Council, 2012 International Building Code, 2011, filed as Exhibit 2041 in Case No. PGR2019-00063 on Feb. 19, 2020, 17 pages.

Supplemental Declaration of Dr. Reynaud Serrette, filed as Exhibit 2042 in Case No. PGR2019-00063 on Feb. 26, 2020, 5 pages.

Petitioner Simpson Strong Tie Company Incs Opposition to Patent Owners Contingent Motion to Amend, Case PGR2019-00063, U.S. Pat. No. 10,316,510, Aug. 27, 2020, 30 pages.

Petitioner Simpson Strong Tie Company Incs Reply to Patent Owners Response, Case PGR2019-00063, U.S. Pat. No. 10,316,510, Aug. 27, 2020, 35 pages.

Exhibit 1038 Serrette Deposition Transcript, Case PGR2019-00063, Jul. 29, 2020, 272 pages.

Exhibit 1039 Fennell Declaration, Case PGR2019-00063, U.S. Pat. No. 10,316,510, Aug. 27, 2020, 28 pages.

Exhibit 1040 Definition, 7 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 1044—Deposition of Dr. Reynaud Serrette, Dec. 22, 2020, 116 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Petitioner's Sur-Reply to Patent Owner's Reply to Petitioner's Opposition to Patent Owner's Revised Contingent Motion to Amend, Dec. 31, 2020, 17 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 2058—Patent Owner's Notice of Submission of Demonstrative Exhibits for Jan. 14, 2021 Oral Hearing, Jan. 11, 2021, 83 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 1045—Petitioner's Demonstratives for Oral Argument, Jan. 14, 2021, 77 pages.

Patent Owner's Response to the Petition for Post Grant Review filed in Case No. PGR2019-00063 on Jun. 4, 2020, 115 pages.

Patent Owner's Contingent Motion to Amend Under 37 C.F.R. Section 42.221 filed in Case No. PGR2019-00063 on Jun. 4, 2020, 41 pages.

Videoconference Deposition of W. Andrew Fennell filed as Exhibit 2043 in Case No. PGR2019-00063 on Jun. 4, 2020, 61 pages.

Third Supplemental Declaration of Dr. Reynaud Serrette filed as Exhibit 2044 in Case No. PGR2019-00063 on Jun. 4, 2020, 44 pages.

International Code Council, 2012 International Building Code, 2011, filed as Exhibit 2045 in Case No. PGR2019-00063 on Jun. 4, 2020, 6 pages.

Buchanan, A. H., Structural Design for Fire Safety, 2001, filed as Exhibit 2046 in Case No. PGR2019-00063 on Jun. 4, 2020, 99 pages.

ASTM International, Standard Test Methods for Fire Tests of Building Construction and Materials, E119-19, filed as Exhibit 2047 in Case No. PGR2019-00063 on Jun. 4, 2020, 37 pages.

American Wood Council, Calculating the Fire Resistance of Exposed Wood Members, Technical Report 10, American Forest & Paper Association, filed as Exhibit 2048 in Case No. PGR2019-00063 on Jun. 4, 2020, 55 pages.

New Oxford American Dictionary, Second Edition, Definition of "through," filed as Exhibit 2049 in Case No. PGR2019-00063 on Jun. 4, 2020, 2 pages.

McEntee, P., "What You Should Know About the New DGH Fire Wall Hanger Options," Feb. 2018, filed as Exhibit 2050 in Case No. PGR2019-00063 on Jun. 4, 2020, 3 pages.

Memorandum of Points and Authorities in Opposition to Motion for Preliminary Injunction filed as Exhibit 2051 in Case No. PGR2019-00063 on Jun. 4, 2020, 31 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Preliminary Guidance Patent Owner's Motion to Amend, Sep. 21, 2020, 12 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Patent Owner's Sur-Reply, Oct. 8, 2020, 37 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Revised Motion to Amend, Oct. 8, 2020, 43 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Petitioner Simpson Strong-Tie Company Inc.'s Opposition to Patent Owner's Revised Contingent Motion to Amend, Nov. 19, 2020, 31 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Patent Owner's Reply in Support of Its Revised Motion to Amend, Dec. 10, 2020, 21 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 1042—Declaration of W. Andrew Fennell in Support of Petitioner's Reply and Opposition to Patent Owner's Revised Contingent Motion to Amend, Nov. 19, 2020, 31 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 1043—Blank Rrendering of Tsukamoto Reference, 1 page.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 2054—Sheet Metal Stamping 101 Parts I-V, 39 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 2055—Declaration of Dr. Serrette in Support of the Revised Contingent Motion to Amend, Oct. 7, 2020, 12 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Exhibit 2056—ANSI/AISC 360-10 Specification for Structural Steel Buildings, Jun. 22, 2010, 35 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Declaration of Dr. Reynaud Serrette in Support of the Reply to the Opposition to the Revised Contingent Motion to Amend, Dec. 10, 2020, 57 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Final Written Decision, Mar. 1, 2021, 143 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Record of Oral Hearing, Jan. 14, 2021, 73 pages.

Petitioner's Request for Rehearing of the Final Written Decision filed in Case No. PGR2019-00063 on Apr. 12, 2021, 17 pages.

Simpson Strong-Tie Company Inc. v. *Columbia Insurance Company* Case PGR2019-00063, Decision Denying Petitioner's Request on Rehearing of Final Written Decision, May 21, 2021, 9 pages.

Post Grant Review Petition of U.S. Pat. No. 11,021,867 dated Aug. 13, 2021, pp. 137.

Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Pat. No. 11,021,867 dated Aug. 13, 2021, pp. 155.

Pages of Oxford Compact English Dictionary—Simpson Strong-Tie Company Inc. EX 1037, published in 2000, pp. 6.

Corrected Opening Brief of Appellant in the Appeal of PGR2019-00063, dated Nov. 12, 2021, pp. 292.

U.S. Patent and Trademark Office Decision Granting Institution of Post-Grant Review, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case No. PGR2021-00109, U.S. Pat. No. 11,021,867 B2, Paper 42, dated Mar. 17, 2022, 89 pages.

Columbia Insurance Company, Patent Owner's Preliminary Response to the Petition for Post Grant Review, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 21, 2021, 119 pp.

(56) **References Cited**

OTHER PUBLICATIONS

Dr. Reynaud Serrette, Declaration, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 21, 2021, 95 pp.
Reynaud Serrette, Ph.D. Curriculum Vitae, undated, 15 pp.
Columbia Insurance Company, Request for Issuance of Certificate of Correction, U.S. Pat. No. 11,021,867, Dec. 2, 2021, 12 pp.
International Code Council (ICC), 2012 International Building Code, May 2011, 70 pp.
ASTM International, Designation: E119-12a, Standard Test Methods for Fire Tests of Building Construction and Materials, Sep. 2012, 34 pp.
ASTM International, Designation: E814-13, Standard Test Method for Fire Tests of Penetration Firestop Systems, Nov. 2013, 12 pp.
Simpson Strong-Tie Company Inc., DU/DHU/DHUTF, Fire Wall Hangers, 2021, 2 pp.
W. Andrew Fennell, Declaration in Support of Petitioner's Reply and Opposition to Patent Owner's Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2019-00063, Aug. 27, 2020. ** UNSIGNED **.
Cooperative Patent Classification, Section E04B, Fixed Constructions, Building: General Building Constructions; Walls, e.g. Partitions; Roofs; Floors; Ceilings; Insulation or Other Protection of Buildings, Aug. 2021, 13 pp.
U.S. Patent and Trademark Office, Response for Certificate of Correction, Decision on Request filed Dec. 2, 2021, U.S. Pat. No. 11,021,867, Dec. 23, 2021, 2 pp.
U.S. Patent and Trademark Office, Certificate of Correction, U.S. Pat. No. 11,021,867, dated Dec. 28, 2021, 1 page.
Columbia Insurance Company, Patent Owner's Response to the Petition for Post Grant Review, Before the Patent Trial and Appeal Board, Jun. 9, 2022, 135 pp.
Columbia Insurance Company, Patent Owner's Contingent Motion to Amend Under 37 C.F.R. 42.221, Before the Patent Trial and Appeal Board, Jun. 9, 2022, 51 pp.
Ed Sauter, Tilt-Up Concrete Association, Tilt-Up Today, Connections in Tilt-Up Buildings, Jul. 1, 2008, 5 pp.
Hanley Wood University, Continuing Education course: Multifamily, Mid-Rise Buildings Using Wood Construction, a Cost-Effective and Sustainable Choice for Achieving High-Performance Goals, undated, 10 pp.
U.S. Dept. of Housing and Urban Development Office of Policy Development and Research, Review of Structural Materials and Methods for Home Building in the United States: 1900 to 2000, Jan. 25, 2001, 48 pp.
Whole Building Design Guide (WBDG), Strategies and Trends for Mid-Rise Construction in Wood, Mar. 10, 2017, 21 pp.
Simpson Strong-Tie Company, Inc., Fastening Systems Technical Guide, 2019, 164 pp.
Rob Thallon, Graphic Guide to Frame Construction, 4th ed, rev./updated, 2016, 258 pp.
Deposition Transcript of W. Andrew Fennell, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, May 25, 2022, 72 pp.
Deposition Transcript of W. Andrew Fennell, Before the Patent Trial and Appeal Board, Case No. PGR2019-00063, May 14, 2020, vol. 1, 61 pp.
Dr. Reynaud Serrette, Supplemental Declaration, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Jun. 9, 2022, 88 pp.
Simpson Strong-Tie Company, Inc., Petitioner's Reply to Patent Owner's Response, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Sep. 1, 2022, 39 pp.
Simpson Strong-Tie Company, Inc., Petitioner's Opposition to Patent Owner's Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Sep. 1, 2022, 33 pp.
Deposition Transcript of Dr. Reynaud Serrette, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Aug. 22, 2022, vol. 1, 270 pp.
Brick Industry Association, Technical Notes on Brick Construction: Fire Resistance of Brick Masonry, Mar. 16, 2008, 16 pp.
W. Andrew Fennell, Declaration in Support of Petitioner's Reply to Patent Owner's Response and Petitioner's Opposition to Patent Owner's Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Sep. 1, 2022, 87 pp.
PABCO Gypsum, QuietRockES product specifications, 2013, 1 page.
National Timber Development Council and Forest and Wood Products Research and Development Corporation (FWPRDC), Multi-Residential Timber Framed Construction, Design Construction Manual, Class1a Buildings, Jun. 2000, 44 pp.
United States Gypsum Company (USG), Sheetrock Brand MH UltraLight Panels TUF-BASE, 2013, 2 pp.
Sterling Publishing, Woodframe Houses: Construction and Maintenance, 1981, excerpt from pp. 68, 115, and 127, 5 pp.
Scott A. Daniels, Neil T. Powell and Stephen E. Belisle, Administrative Law Judges, Preliminary Guidance Patent Owner's Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, undated, 17 pp.
Columbia Insurance Company, Revised Contingent Motion to Amend Under 35 C.F.R. 42.221, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 53 pp.
Columbia Insurance Company, Sur-Reply to the Petition for Post Grant Review, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 39 pp.
Deposition Transcript of W. Andrew Fennell, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 5, 2022, 78 pp.
Dr. Reynaud Serrette, Third Declaration, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 14 pp.
Simpson Strong-Tie Company, Inc., Responsive Brief and Opening Cross-Appeal Brief, United States Court of Appeals for the Federal Circuit, Case Nos. 21-2145 and 21-2157, Feb. 3, 2022, 101 pp.
Columbia Insurance Company, Appellant's Response and Reply Brief, United States Court of Appeals for the Federal Circuit, Case Nos. 21-2145, 21-2157, Apr. 29, 2022, 70 pp.
Simpson Strong-Tie Company, Inc., Reply Brief, United States Court of Appeals for the Federal Circuit, Case Nos. 21-2145, 21-2157, Jun. 10, 2022, 41 pp.
Columbia Insurance Company, Patent Owner's Revised Contingent Motion to Amend Under 37 CFR 42.221, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 53 pages (including Appendix).
Columbia Insurance Company, Patent Owner's Sur-Reply to the Petition for Post-Grant Review, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 39 pages.
Deposition Transcript of W. Andrew Fennell, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 5, 2022, 78 pages.
Dr. Reynaud Serrette, Third Declaration, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Oct. 13, 2022, 14 pages.
Simpson Strong-Tie Company Inc., Petitioner's Opposition to Patent Owner's Revised Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Nov. 23, 2022, 34 pages.
W. Andrew Fennell's Declaration in Support of Petitioner's Opposition to Patent Owner's Revised Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Nov. 23, 2022, 65 pages.
Preliminary Guidance, Columbia Insurance Company, Patent Owner's Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Sep. 26, 2022, 17 pages.
Oxford University Press, Inc., The New Oxford American Dictionary, second edition, definition of "manufacture", 2005, 4 pages.
Columbia Insurance Company, Patent Owner's Exhibit 2066—Blank renderings of the Hanger Shown in Figs. 5-7, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, 2 pages.
Simpson Strong-Tie Company Inc., Wood Construction Connectors 2013-2014 Catalog, 106 pages.
Dr. Reynaud Serrette, Fourth Declaration, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 16, 2022, 56 pages.
Deposition Transcript of William Andrew Fennell, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 8, 2022, 125 pages.

(56) **References Cited**

OTHER PUBLICATIONS

Columbia Insurance Company, Patent Owner's Reply in Support of Its Revised Contingent Motion to Amend Under 35 CFR 42.221, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 16, 2022, 23 pages.
Deposition Transcript of Dr. Reynaud Serrette, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Dec. 29, 2022, 83 pages.
Simpson Strong-Tie Company Inc., Petitioner's Sur-Reply to Patent Owner's Reply to Petitioner's Opposition to the Patent Owner's Revised Contingent Motion to Amend, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Jan. 6, 2023, 21 pages.
Columbia Insurance Company, Patent Owner's Demonstratives, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Jan. 2023, 94 pages.
Simpson Strong-Tie Company Inc., Petitioner's Demonstratives for Oral Argument, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, Jan. 2023, 69 pages.
Record of Oral Hearing held Jan. 17, 2023, Before the Patent Trial and Appeal Board, Case No. PGR2021-00109, 78 pages.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-1 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 17 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-2 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 14 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-3 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 18 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-4 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 22 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-5 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 9 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,021,867, Exhibit A-6 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 7 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-1 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 58 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-2 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 27 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-3 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 3 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-4 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 67 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-5 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 76 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-6 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 4 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-7 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 43 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-8 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 4 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-9 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 60 pp.
Invalidity Claim Chart, U.S. Pat. No. 11,649,626, Exhibit B-10 to Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 5 pp.
Invalidity Contentions, Simpson Strong-Tie Company, Inc.'s Invalidity Contentions Pursuant to Patent Local Rules 3-3 and 3-4, dated Oct. 20, 2023, 15 pp.
Complaint for Patent Infringement; Jury Trial Requested, dated May 17, 2023, U.S. District Court, Northern District of California, *Columbia Insurance Co.* and *MiTek Inc.* v. *Simpson Strong-Tie Company Inc.*, 562 pages.
"Fully-loaded Getting the Most from Sloped and Skewed w Hangers", Connector Update, vol. 2, No. 3, Nov. 1990, 2 pages.
Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 15, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00047, 226 pages.
Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 17, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00047, 203 pages.
Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 17, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00048, 260 pages.
Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 17, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00048, 227 pages.
Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 15, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00049, 225 pages.
Petition for Post-Grant Review of U.S. Pat. No. 11,649,626, dated Aug. 17, 2023, U.S. Patent Trial and Appeal Board, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case PGR2023-00049, 197 pages.
Appellant Simpson Strong-Tie Company Inc.'s Principal Brief, dated Oct. 16, 2023, U.S. Court of Appeals for the Federal Circuit, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case No. 2023-1944, 306 pages.
Final Written Decision of the Patent Trial and Appeal Board, *Simspon Strong-Tie Company Inc.* v. *Columbia Insurance Company*, PGR2021-00109, U.S. Pat. No. 11,021,867B2, Paper 73, dated Mar. 15, 2023, 165 pages.
Appellee Columbia Insurance Company's Brief, dated Nov. 27, 2023, U.S. Court of Appeals for the Federal Circuit, *Simpson Strong-Tie Company Inc.* v. *Columbia Insurance Company*, Case No. 2023-1944, 87 pages.

* cited by examiner

FIG. 1

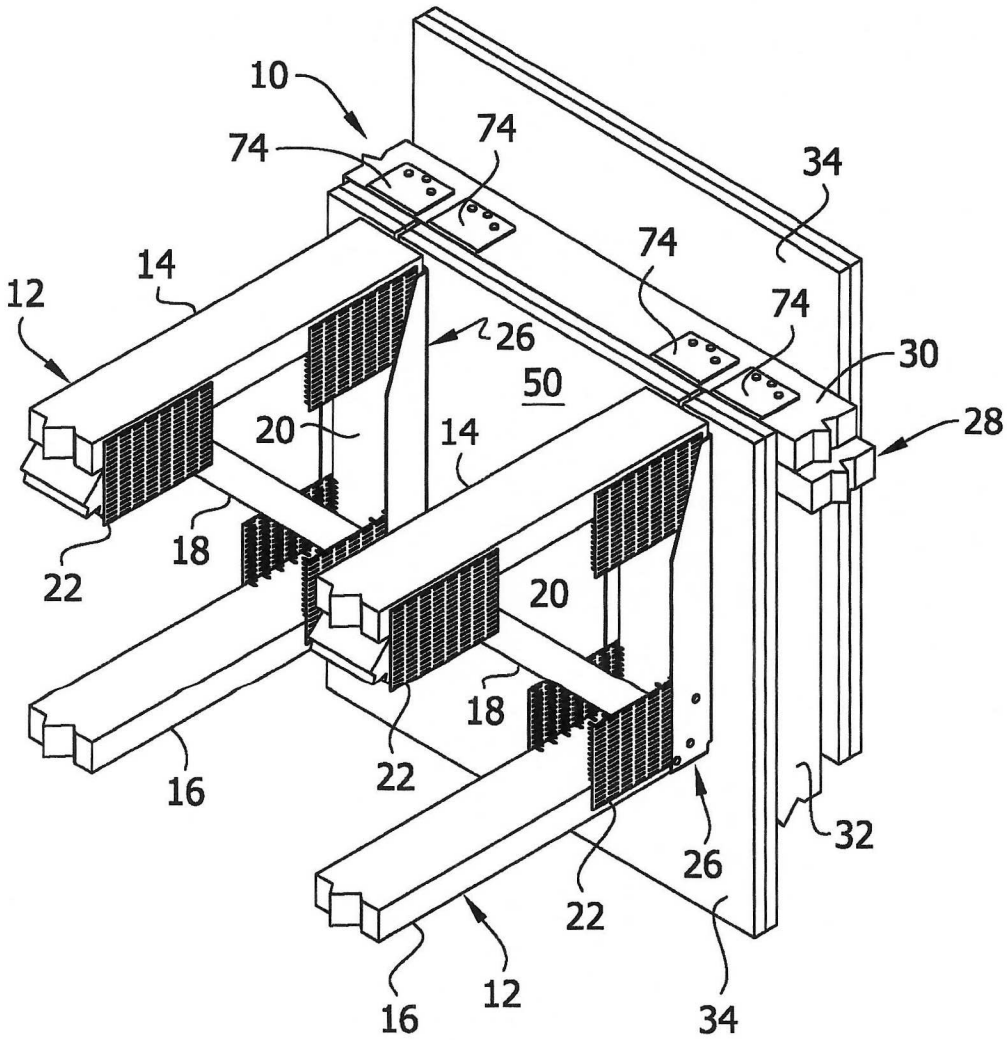
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FIG. 2

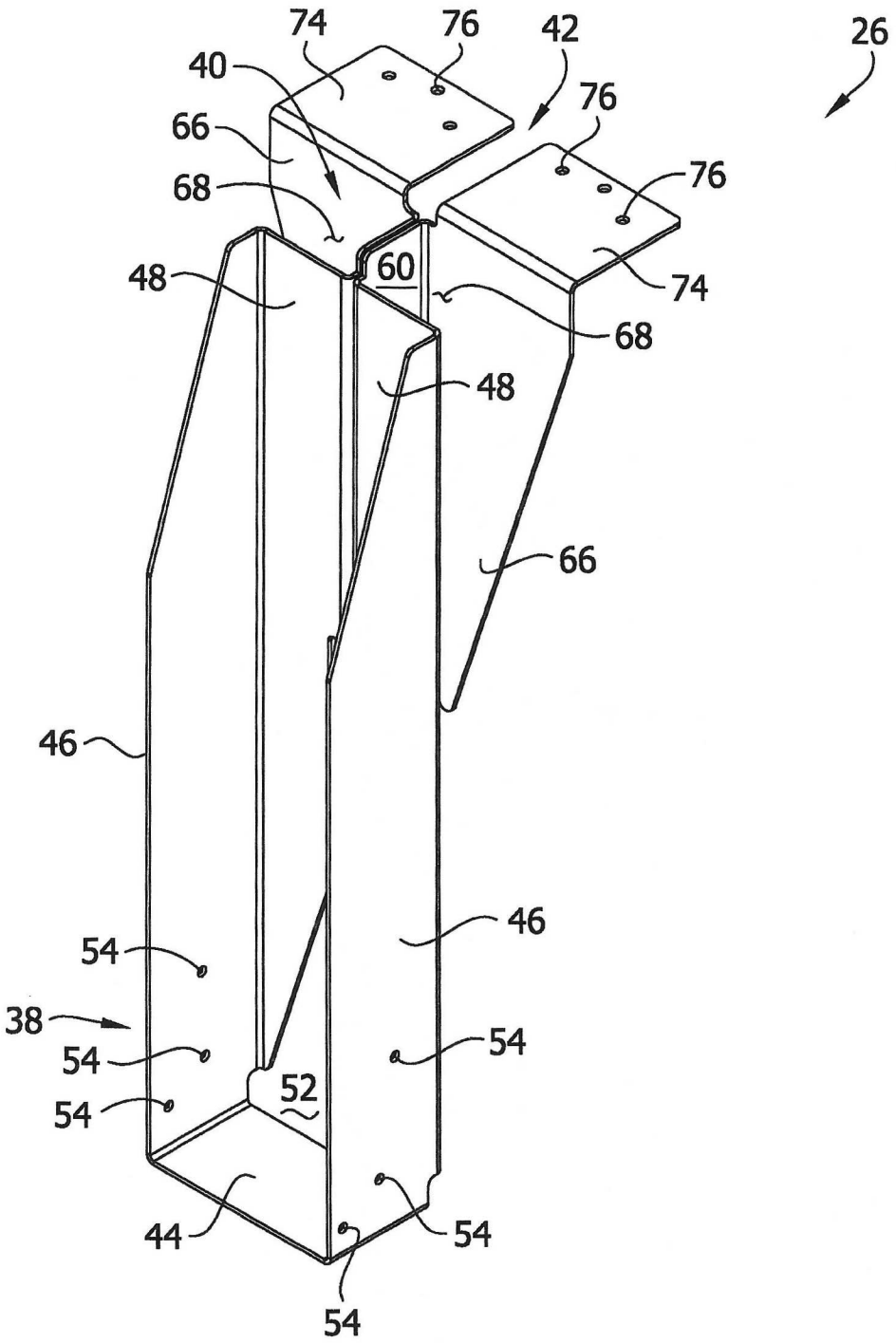
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FIG. 2A

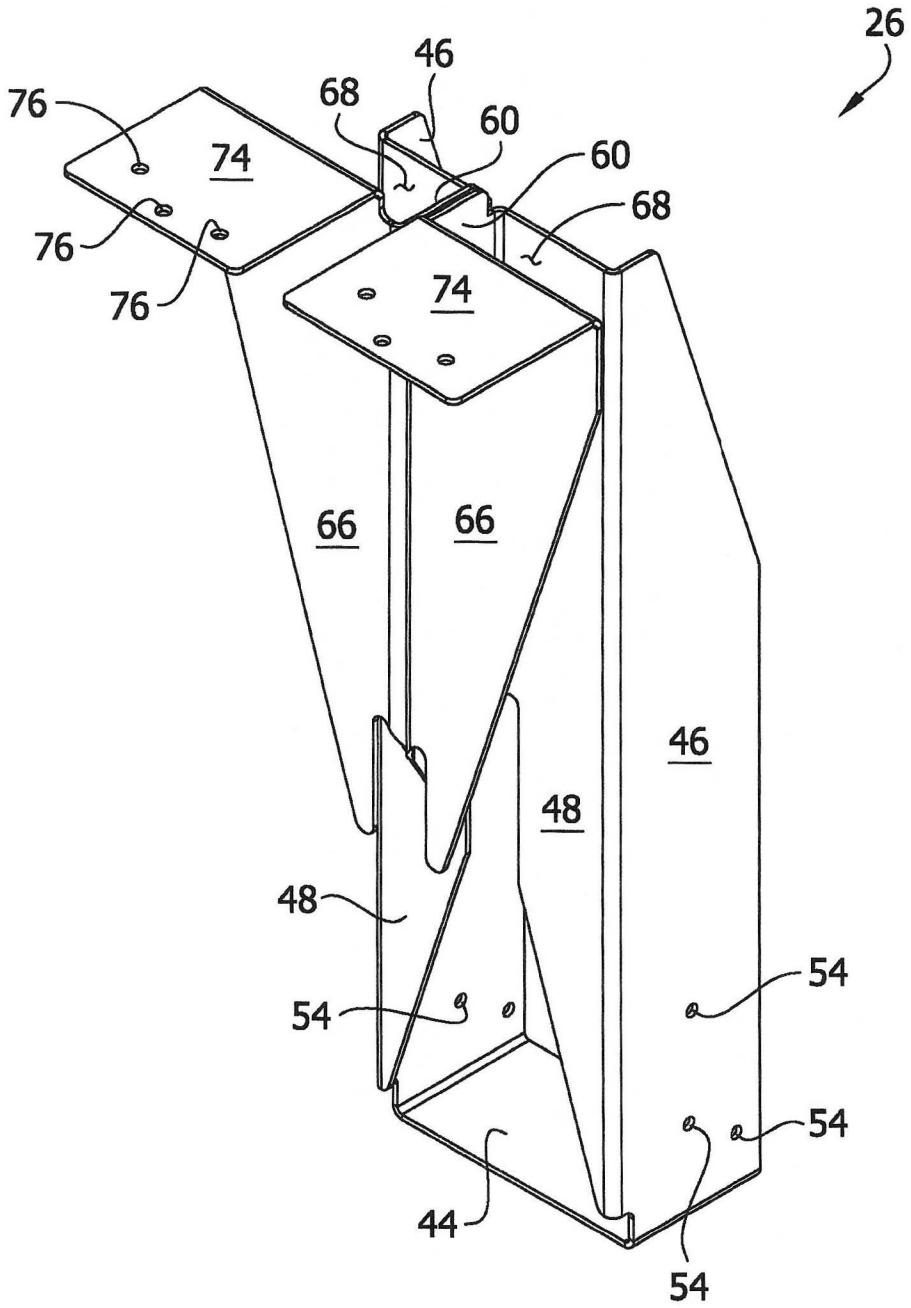

FIG. 3

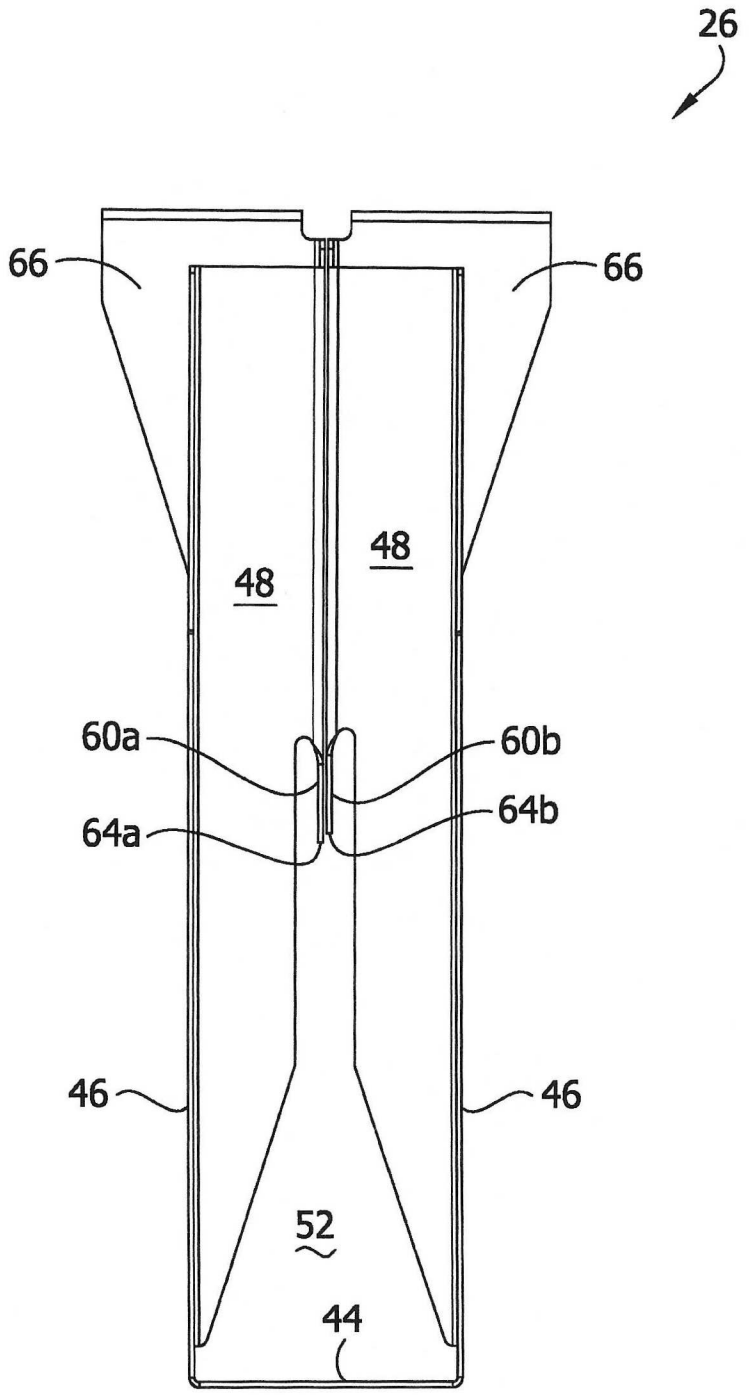

FIG. 4

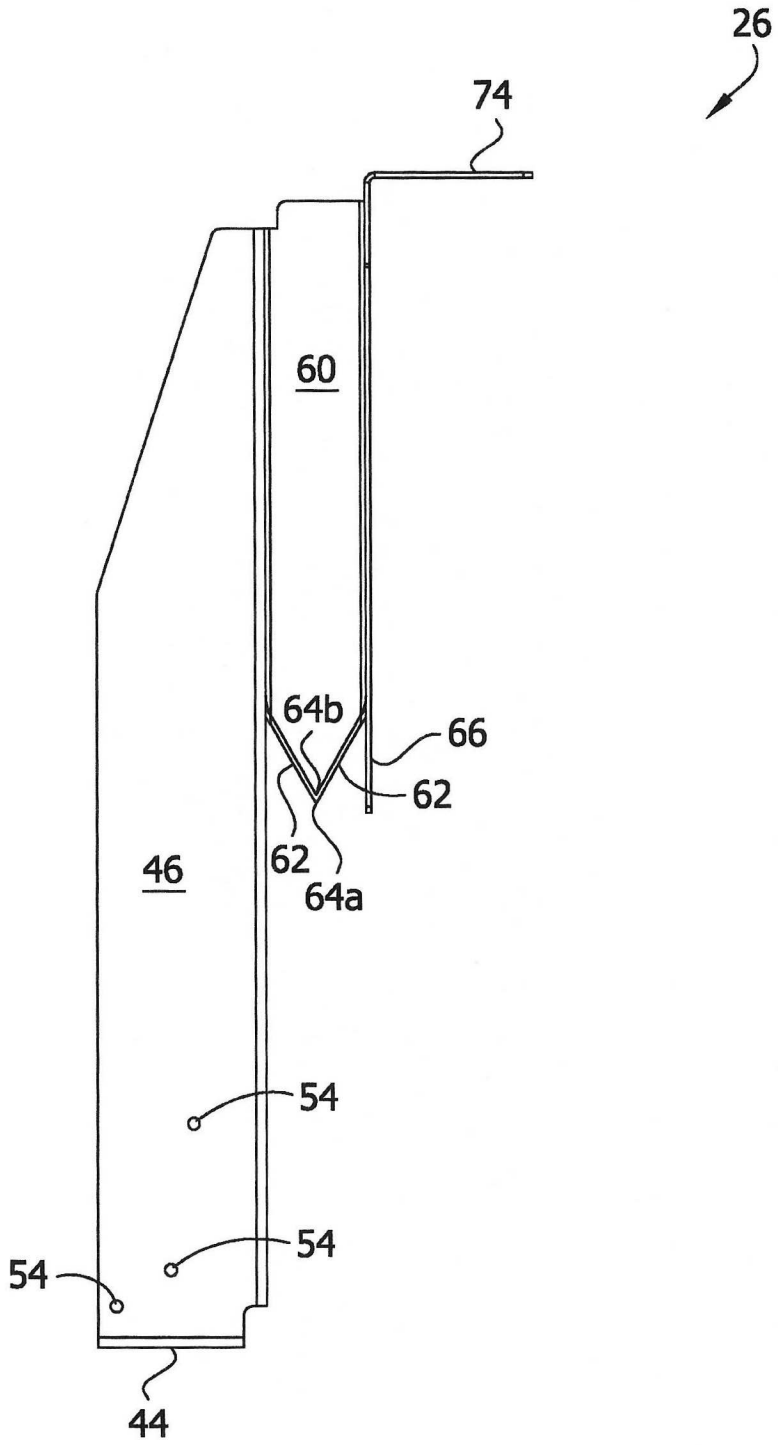

FIG. 5

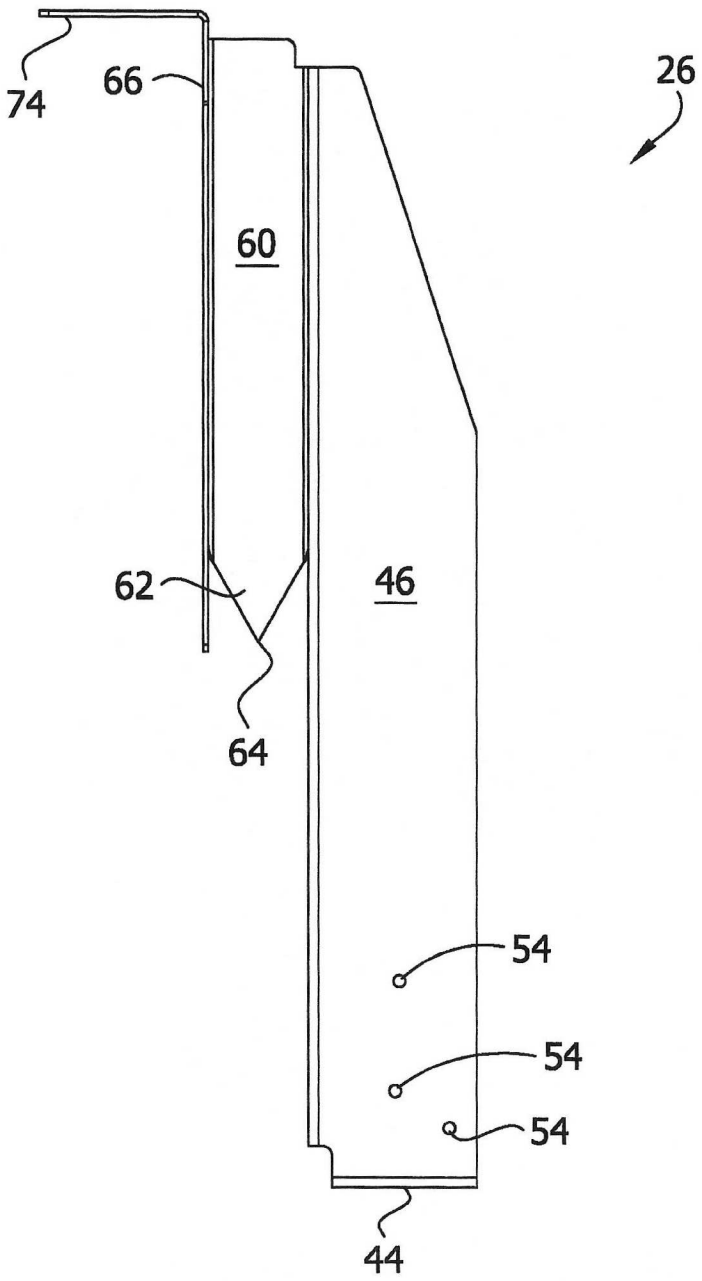

FIG. 6

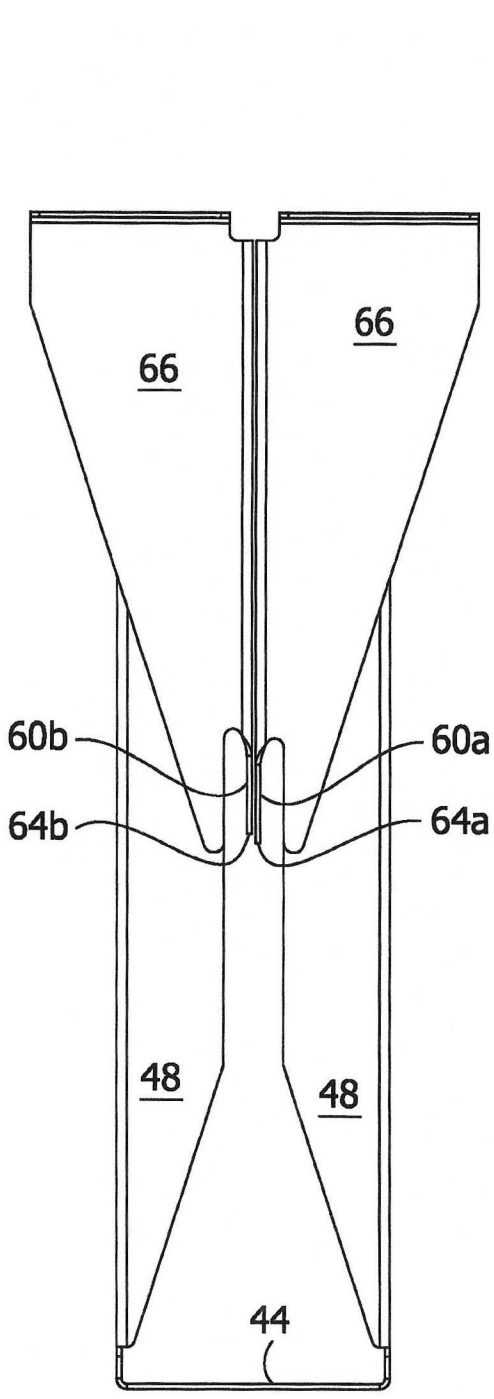

FIG. 7

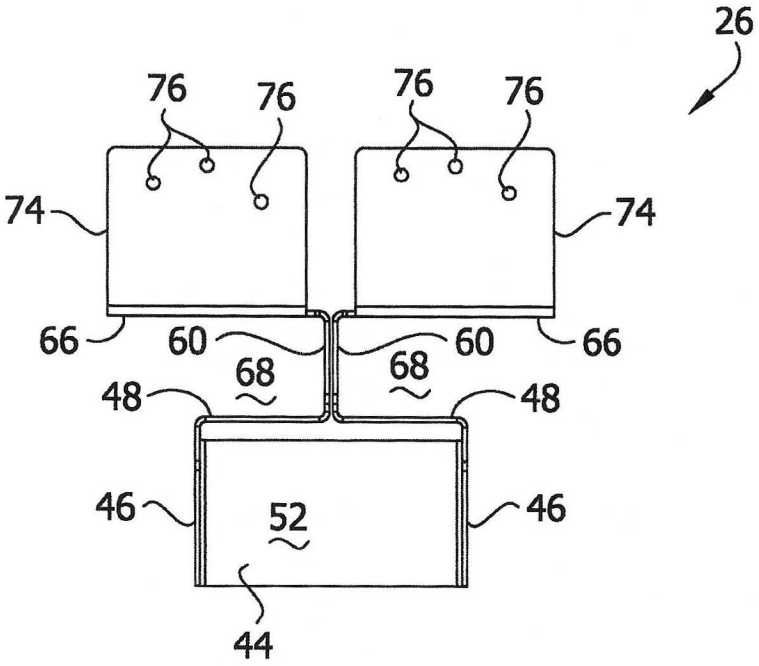
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FIG. 8

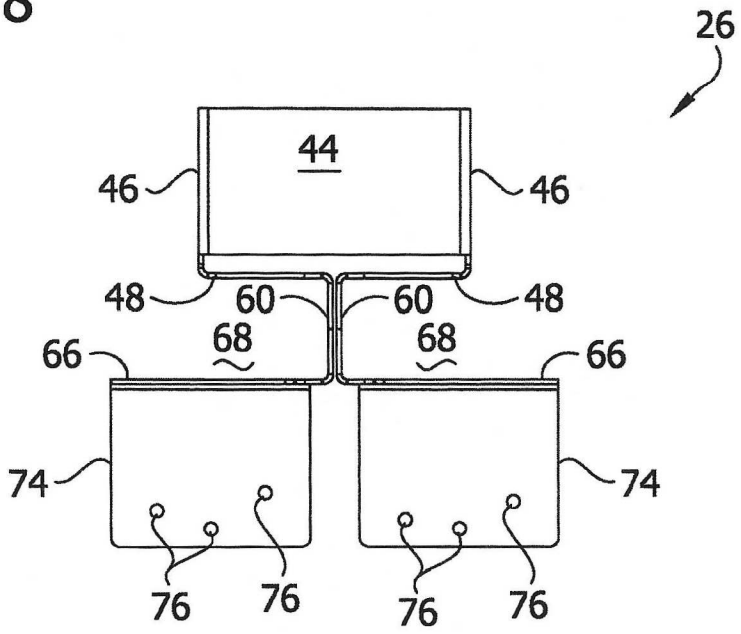
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FIG. 9

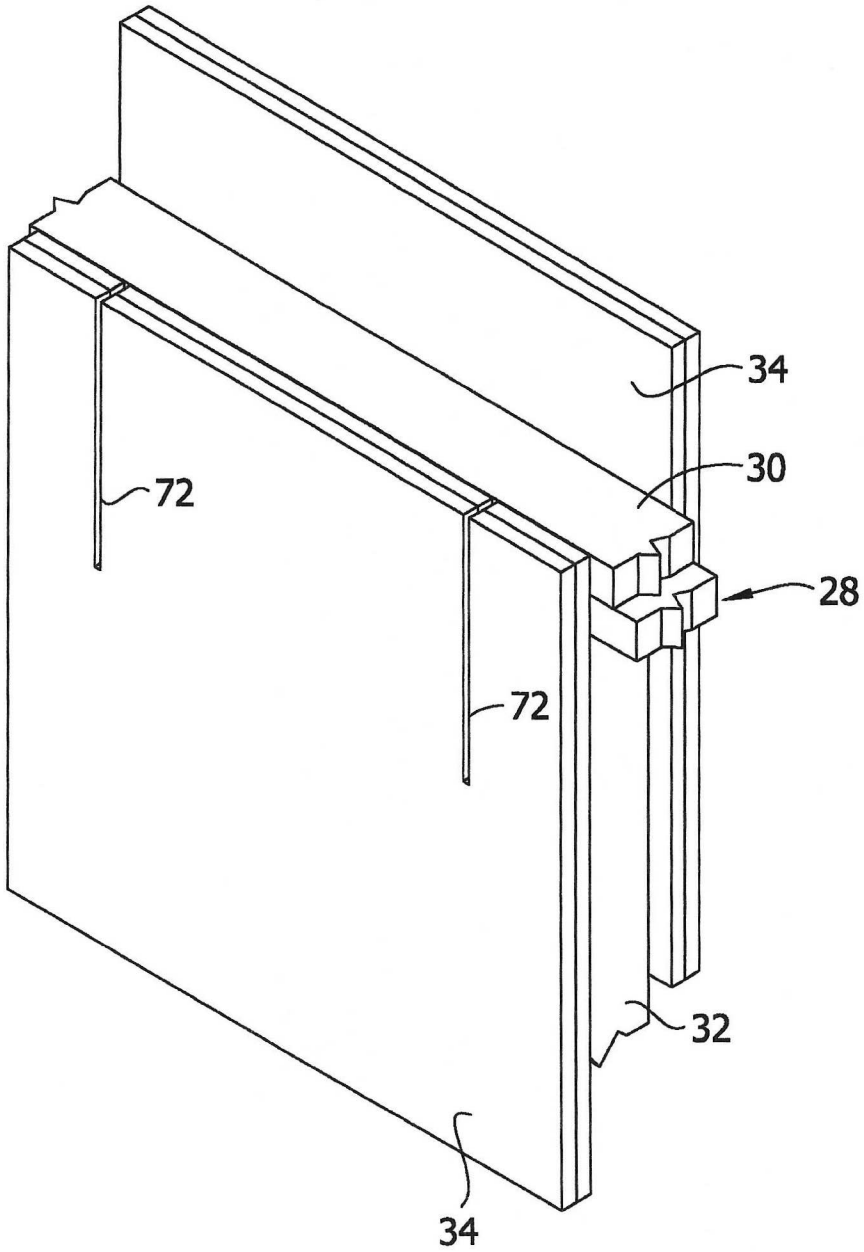

FIG. 10

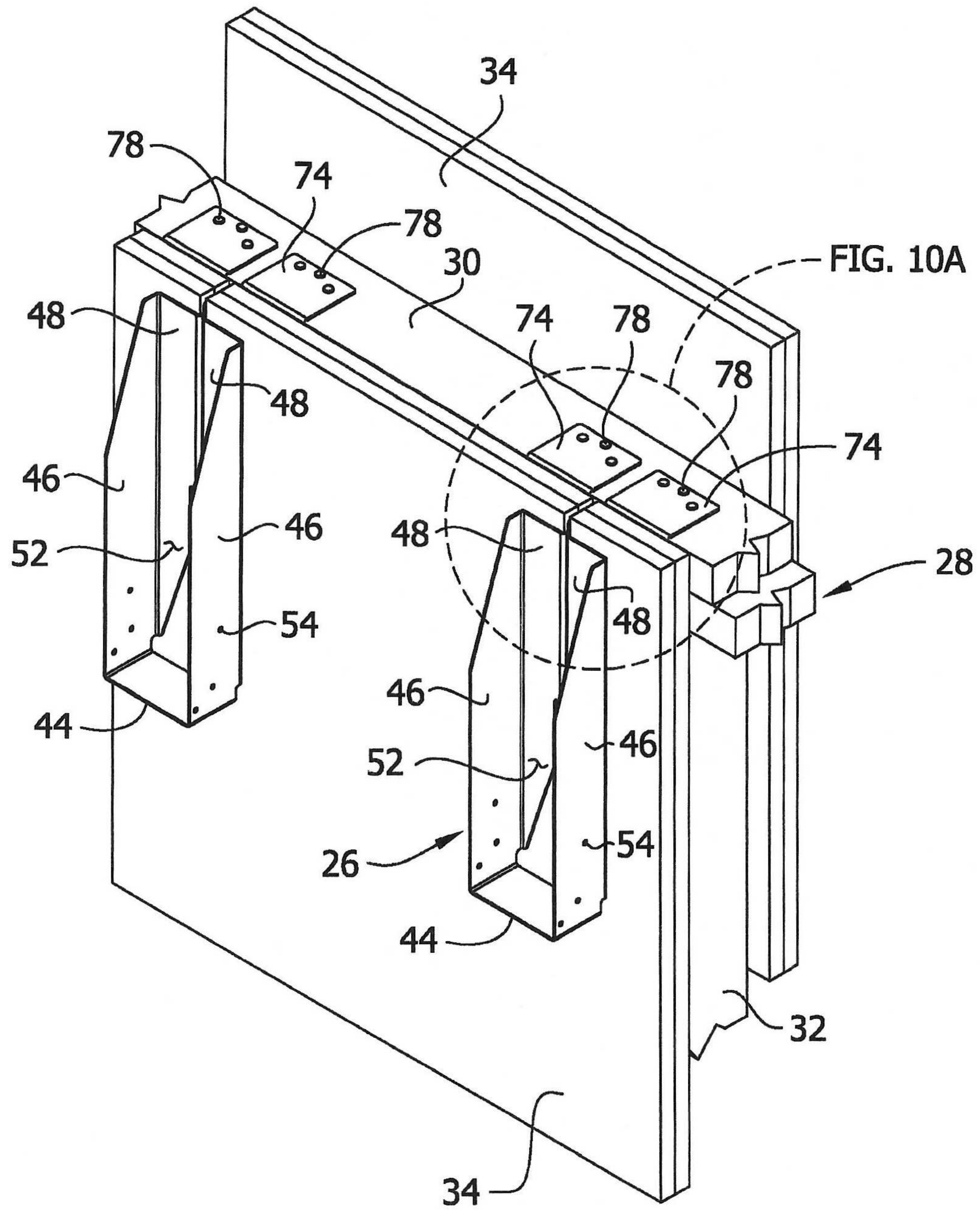

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FIG. 10A
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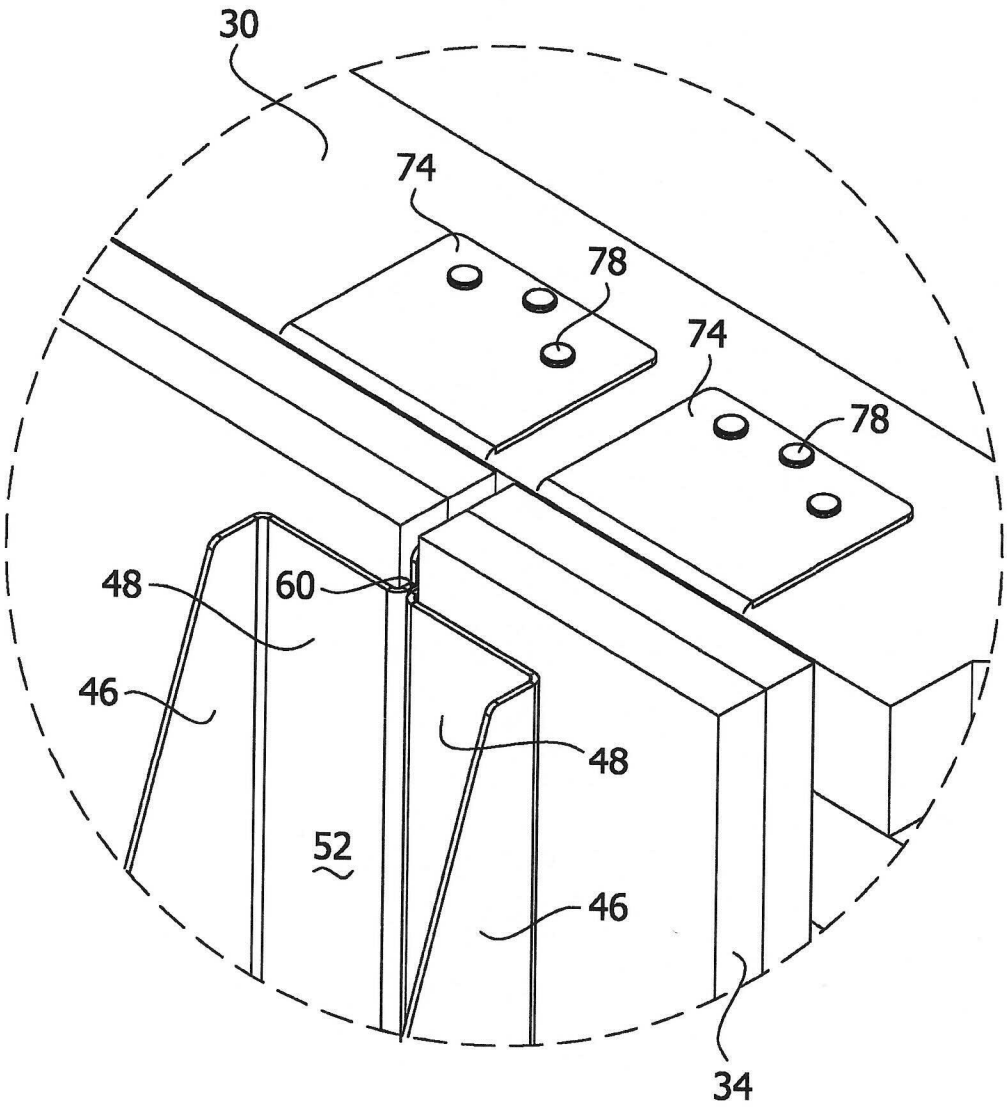
FIG. 10A



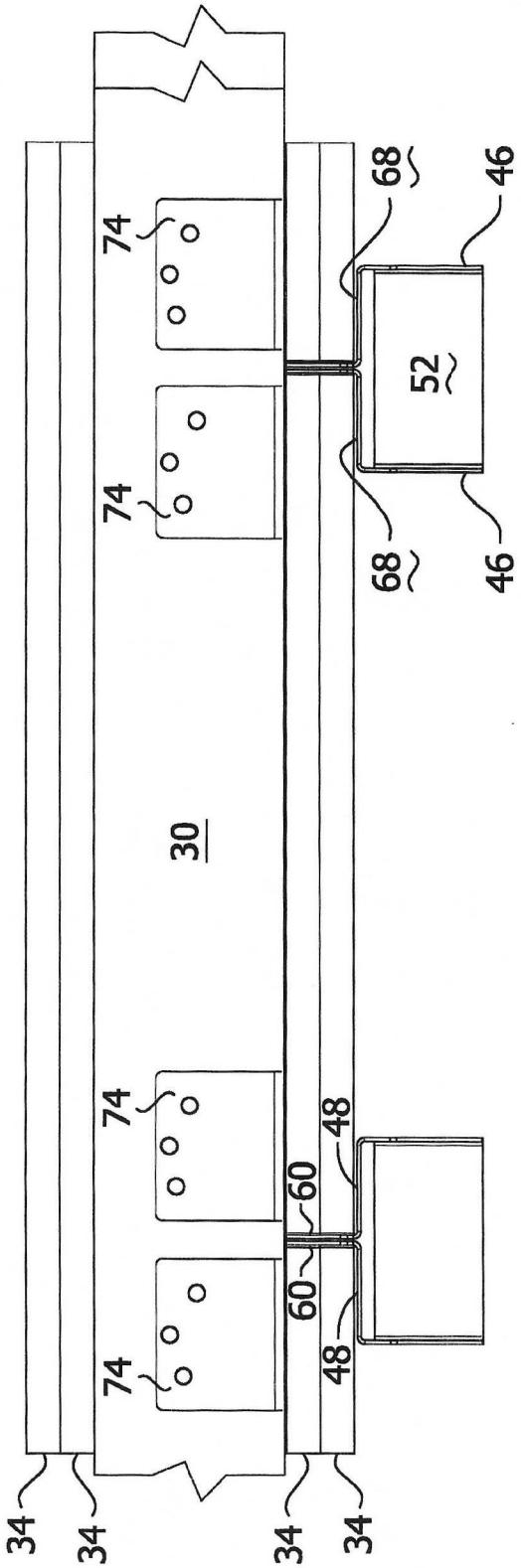


FIG. 11

FIG. 12

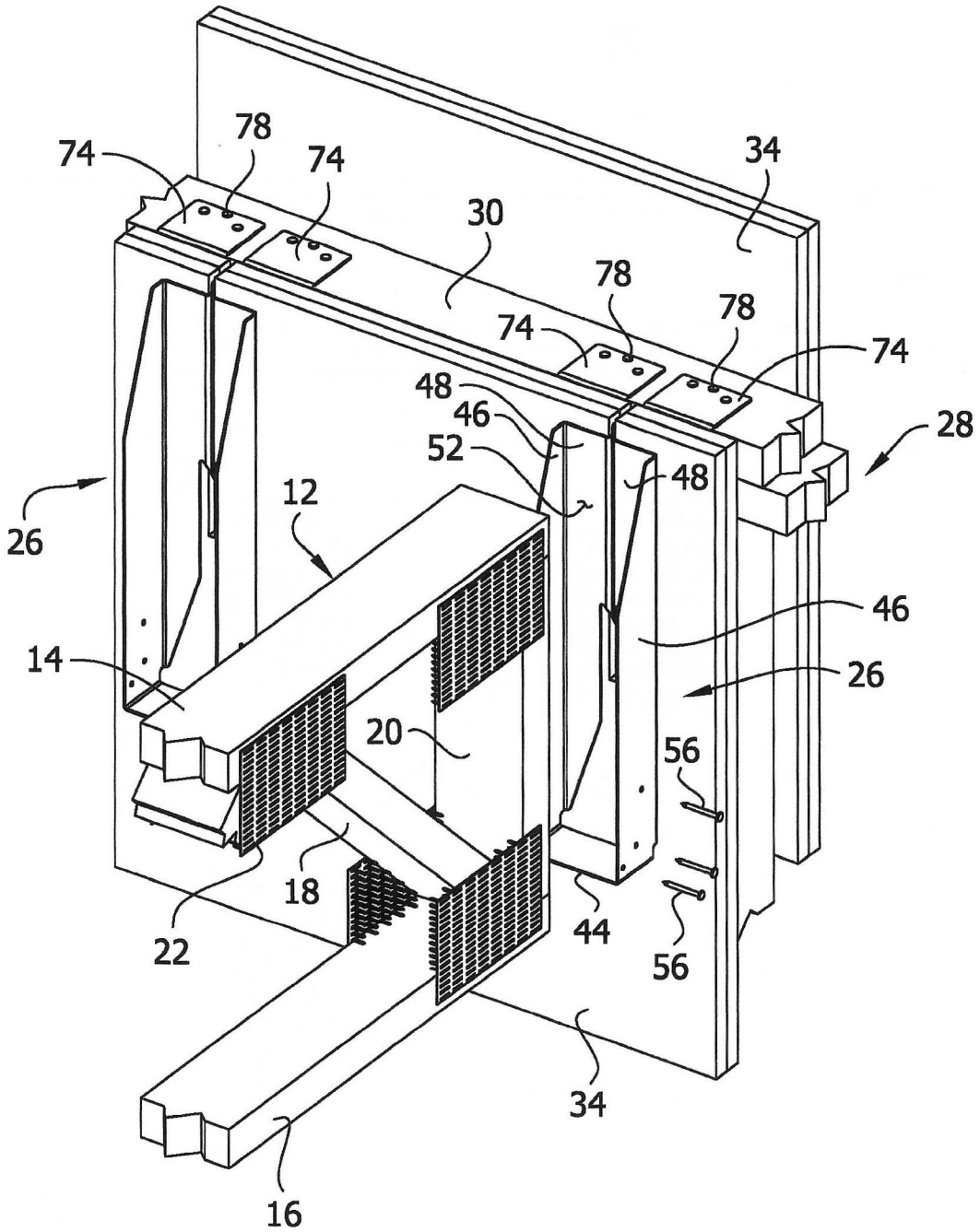

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FIG. 14

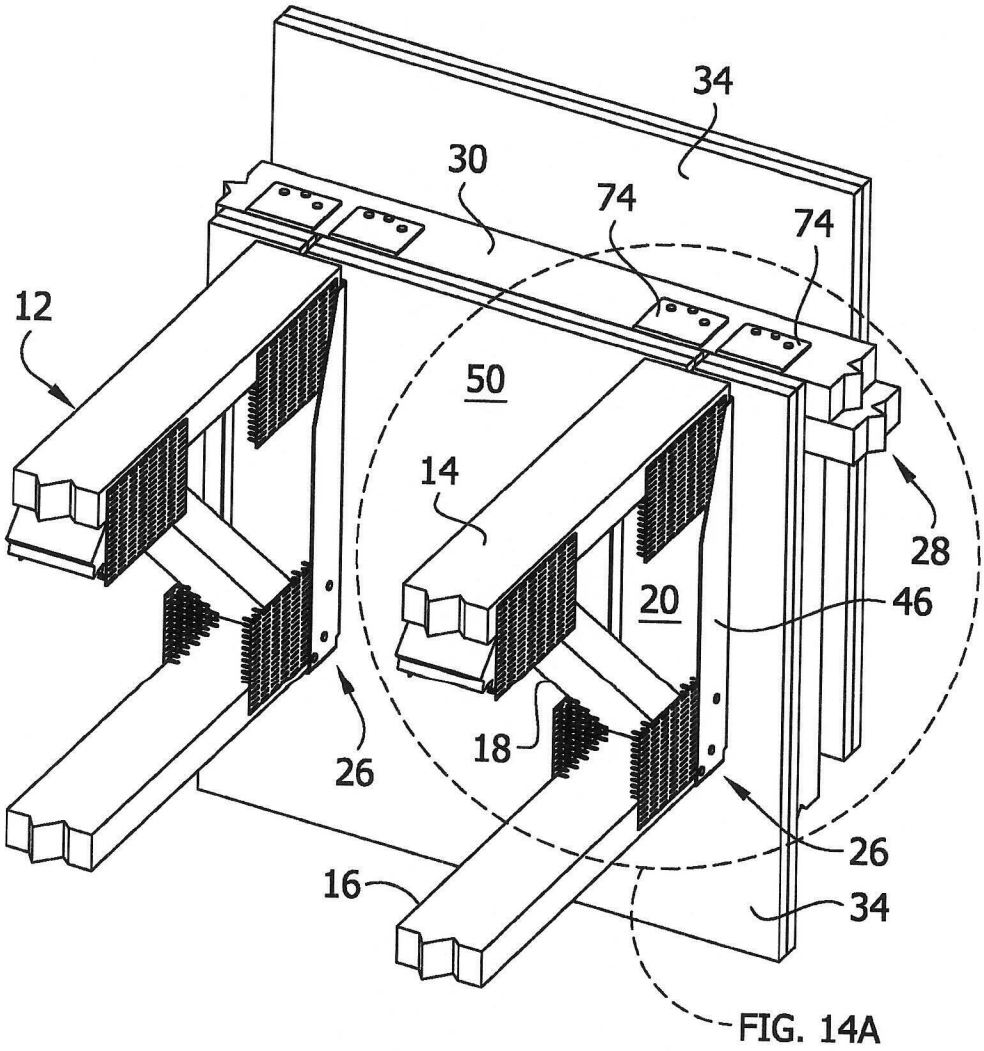


FIG. 14A

FIG. 14A

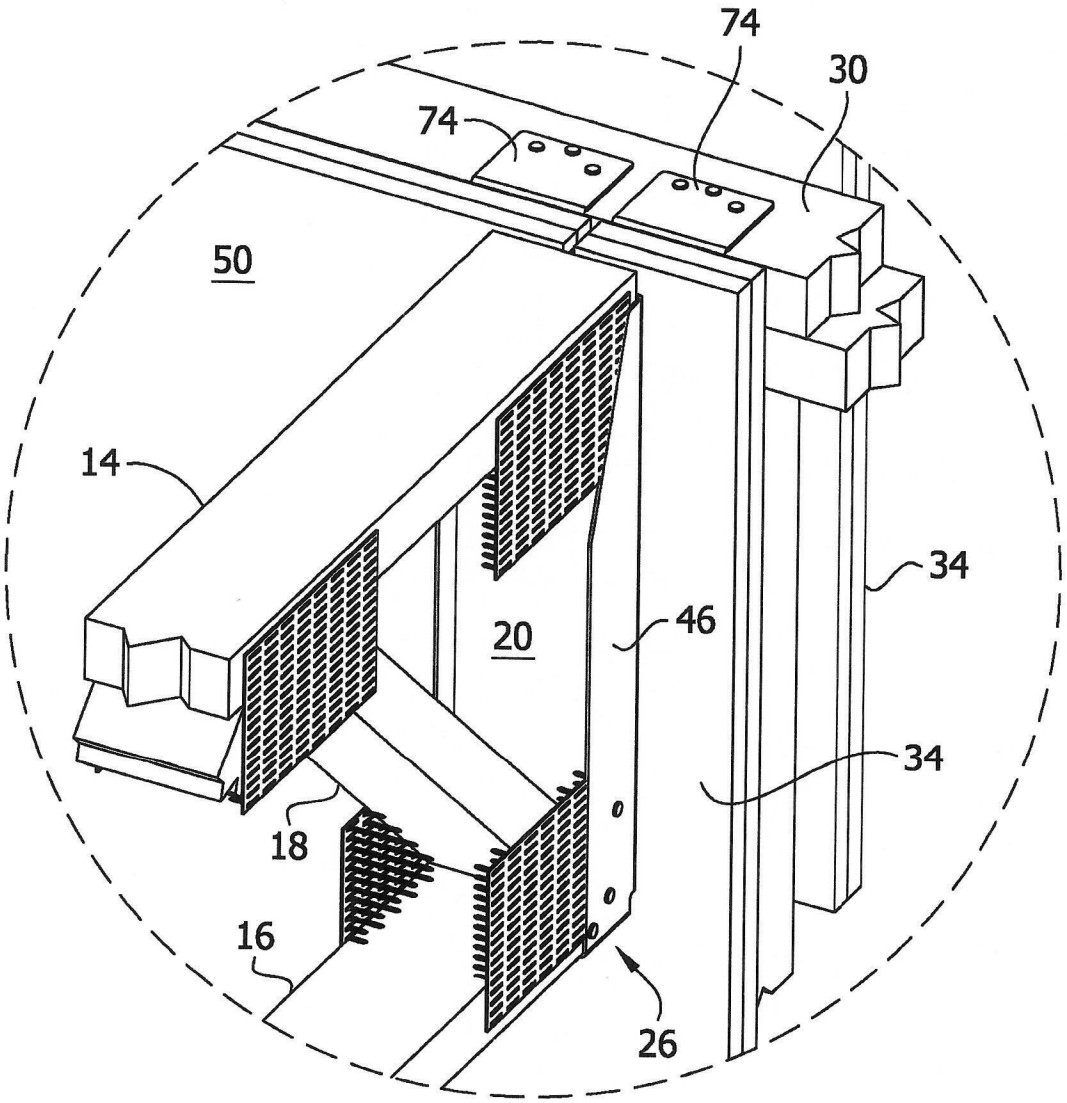


FIG. 15

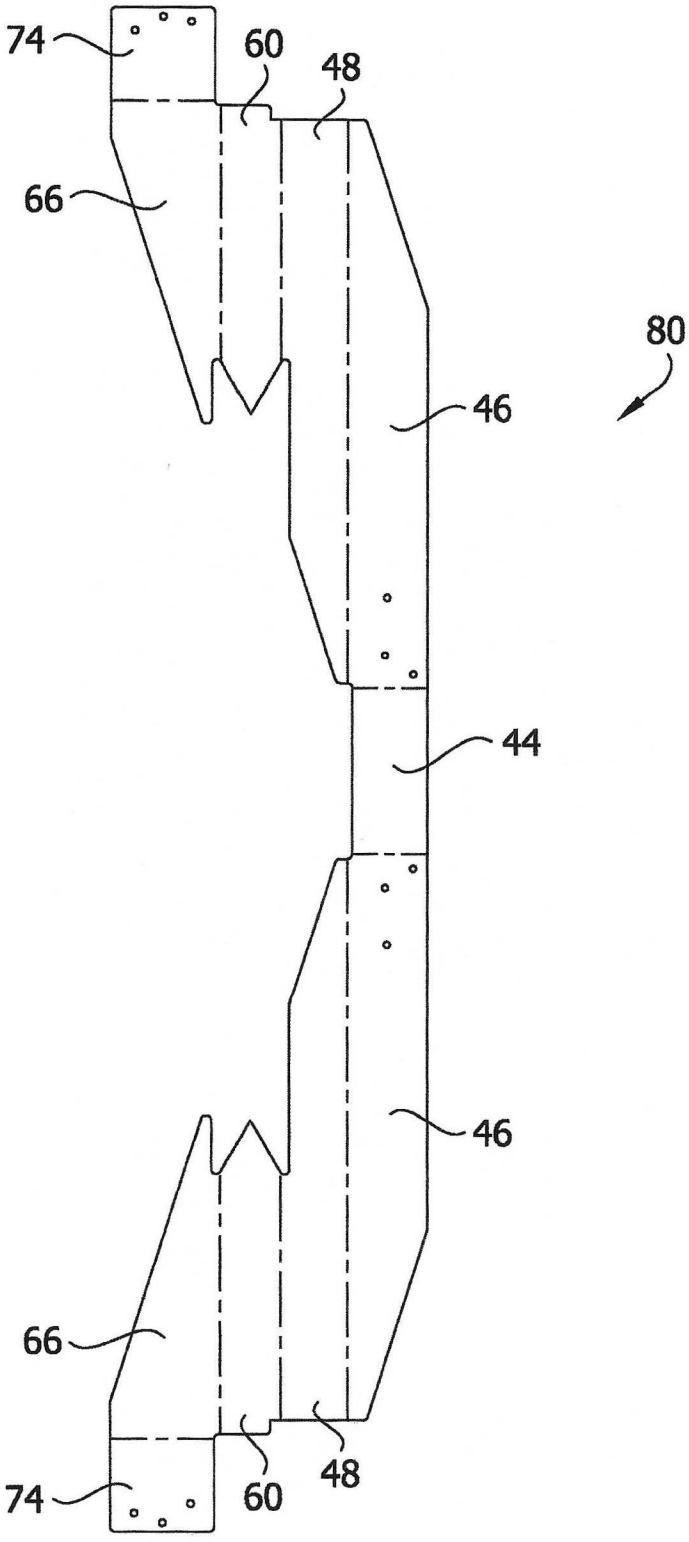


FIG. 16

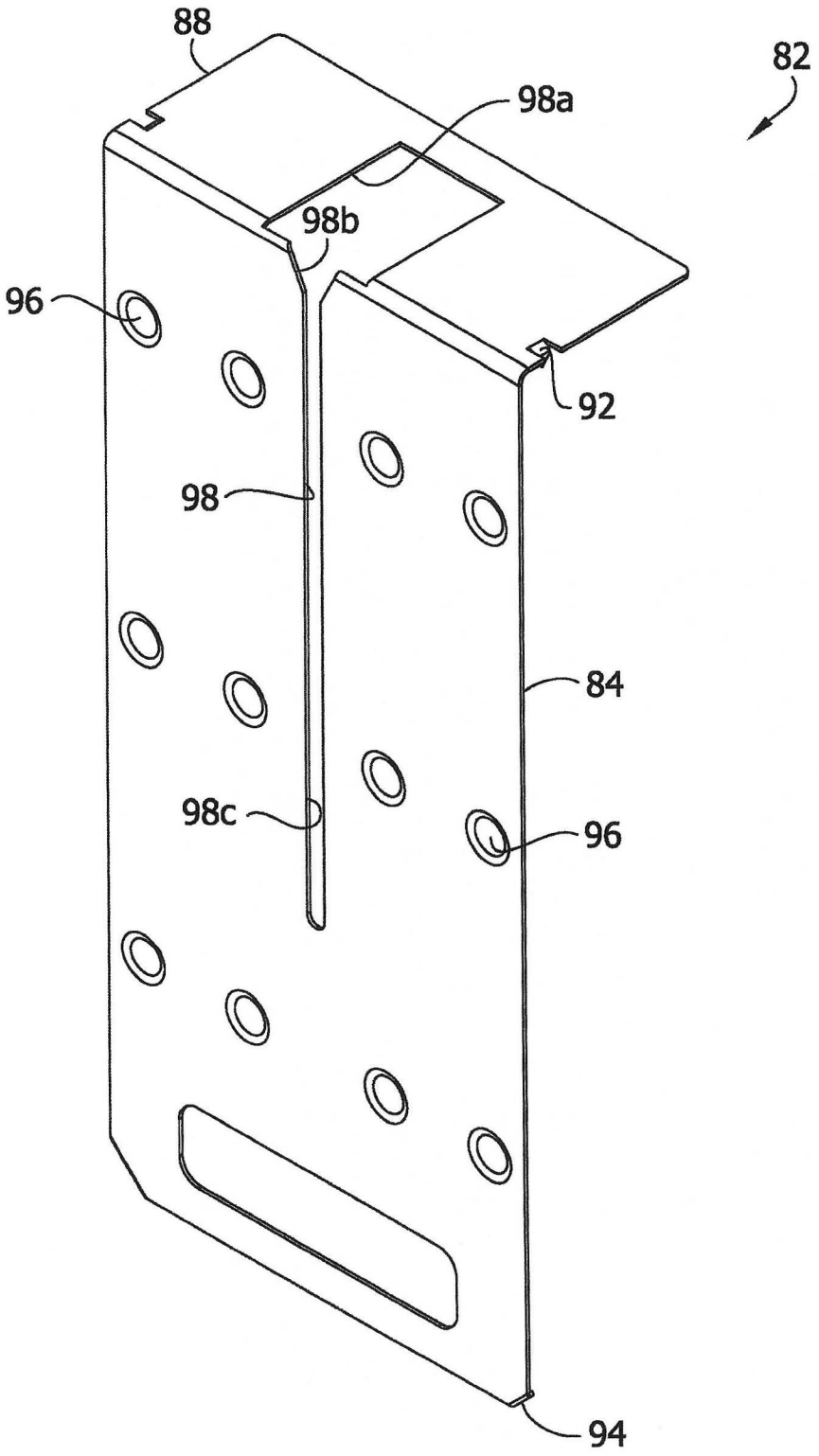


FIG. 17

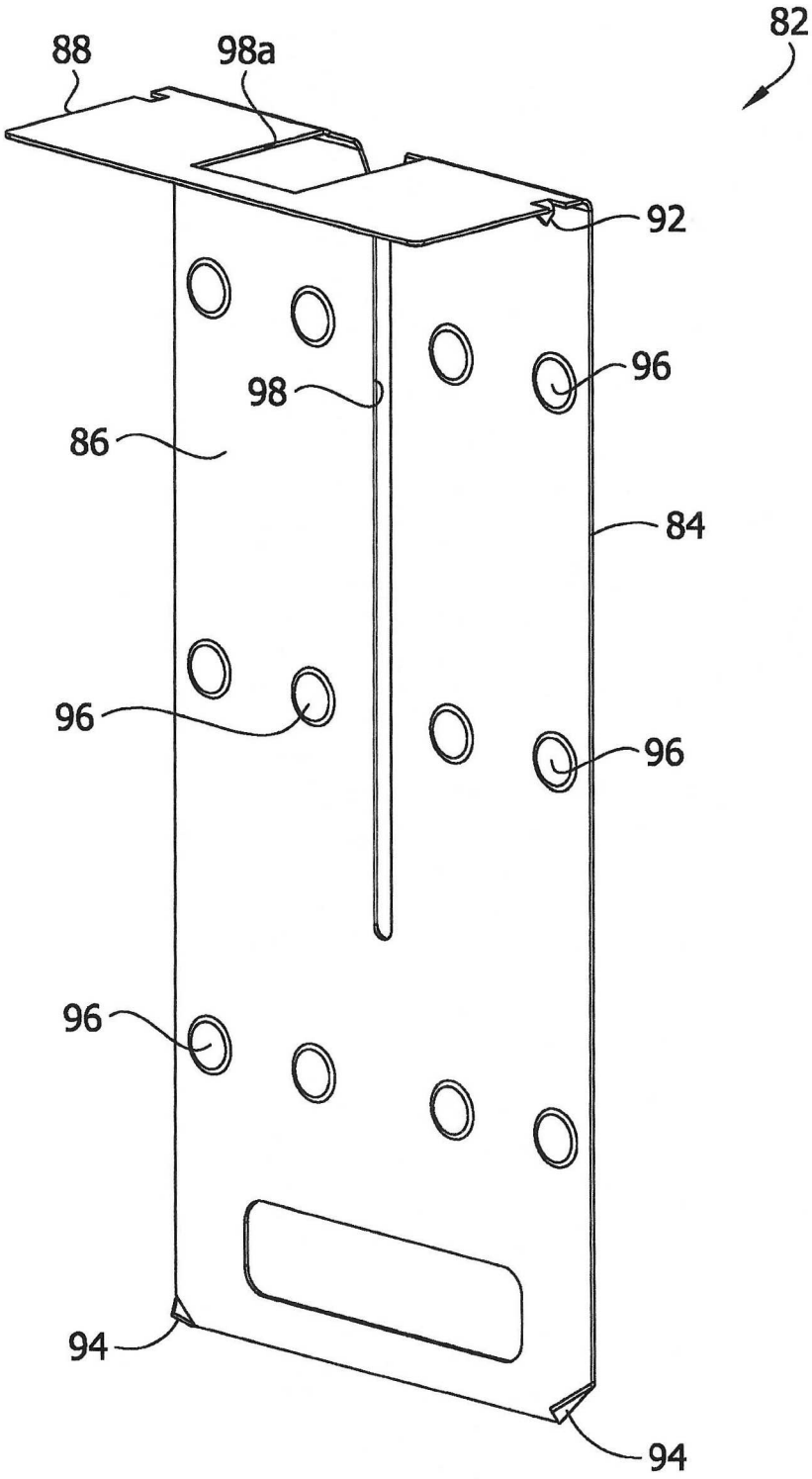


FIG. 18

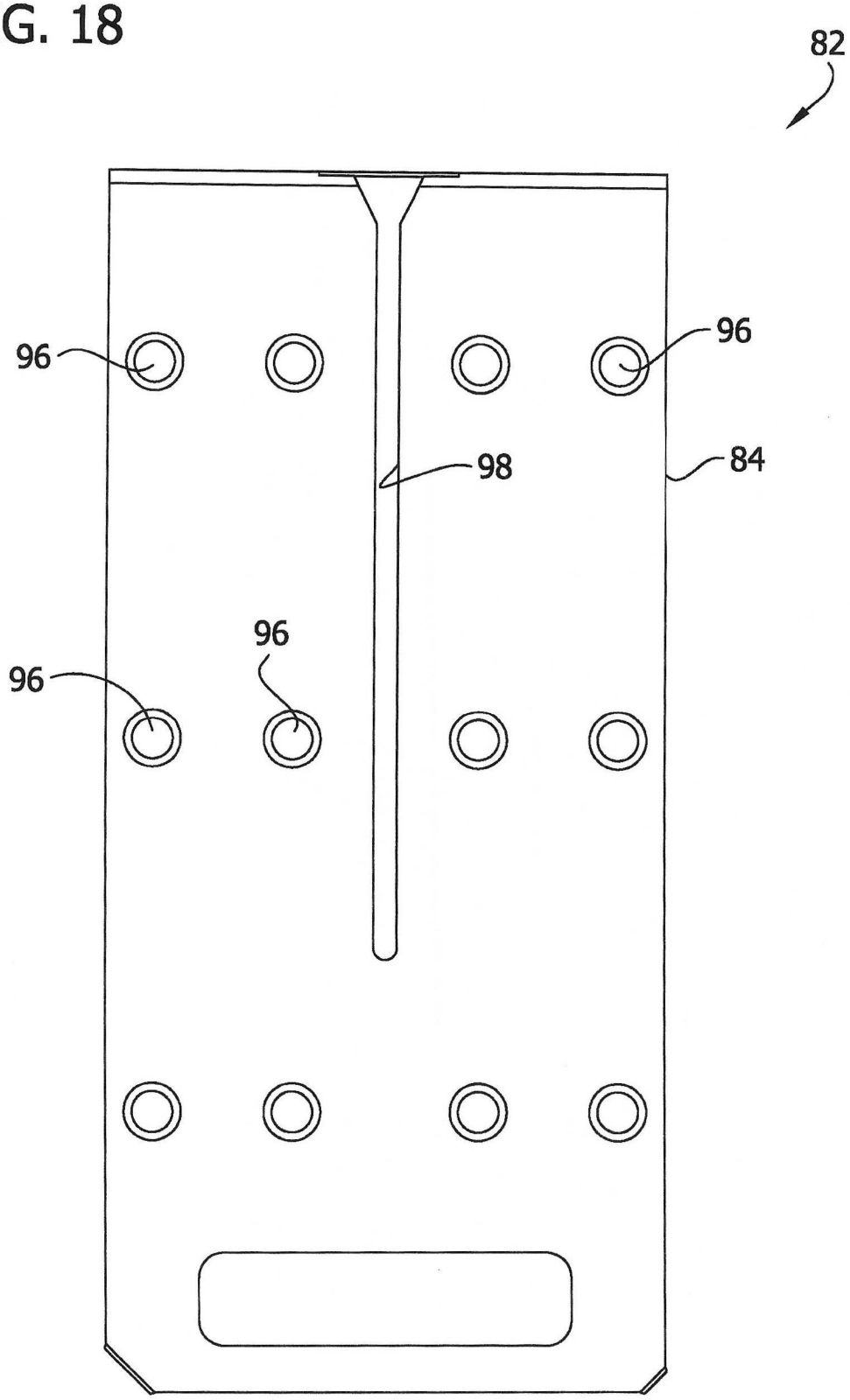


FIG. 19

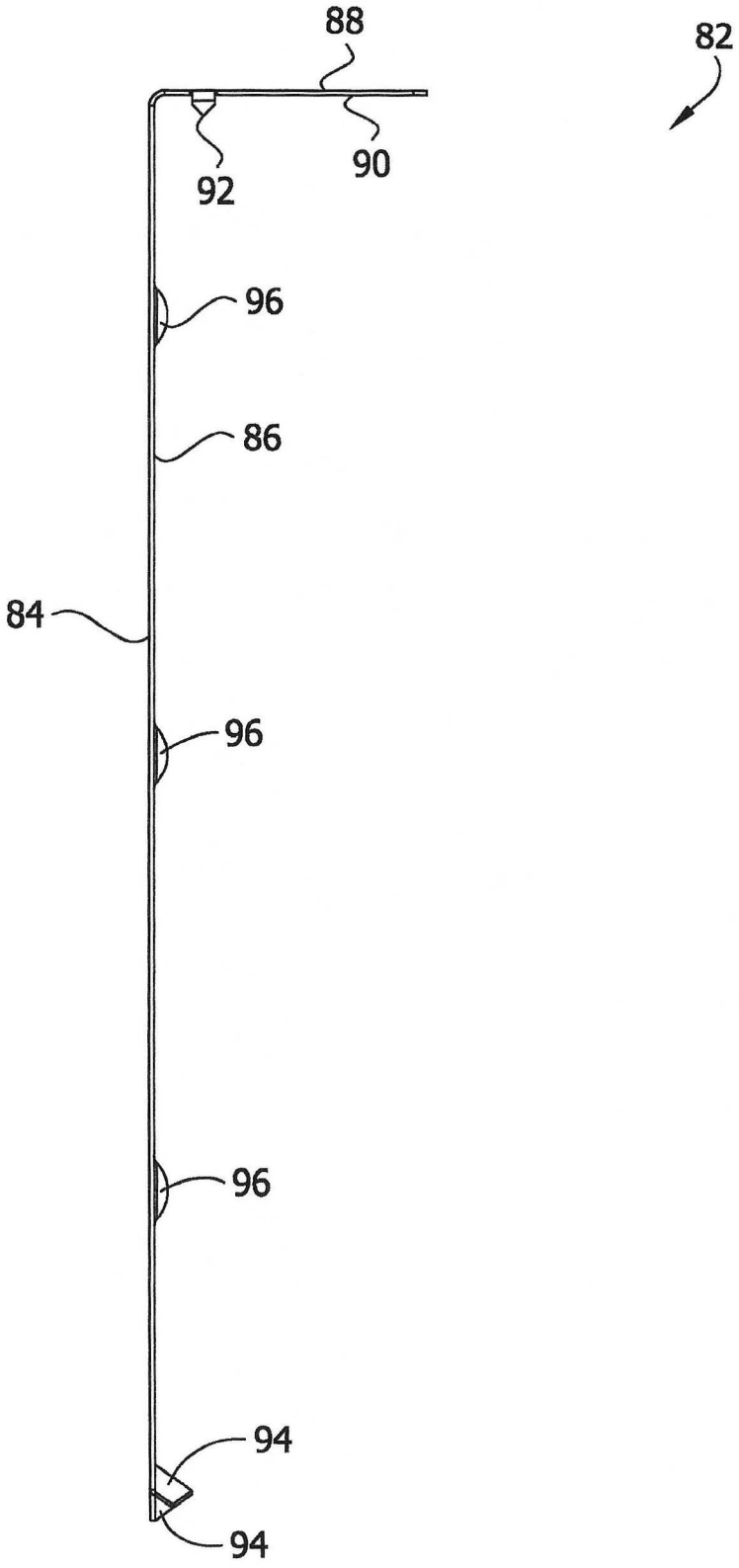


FIG. 20

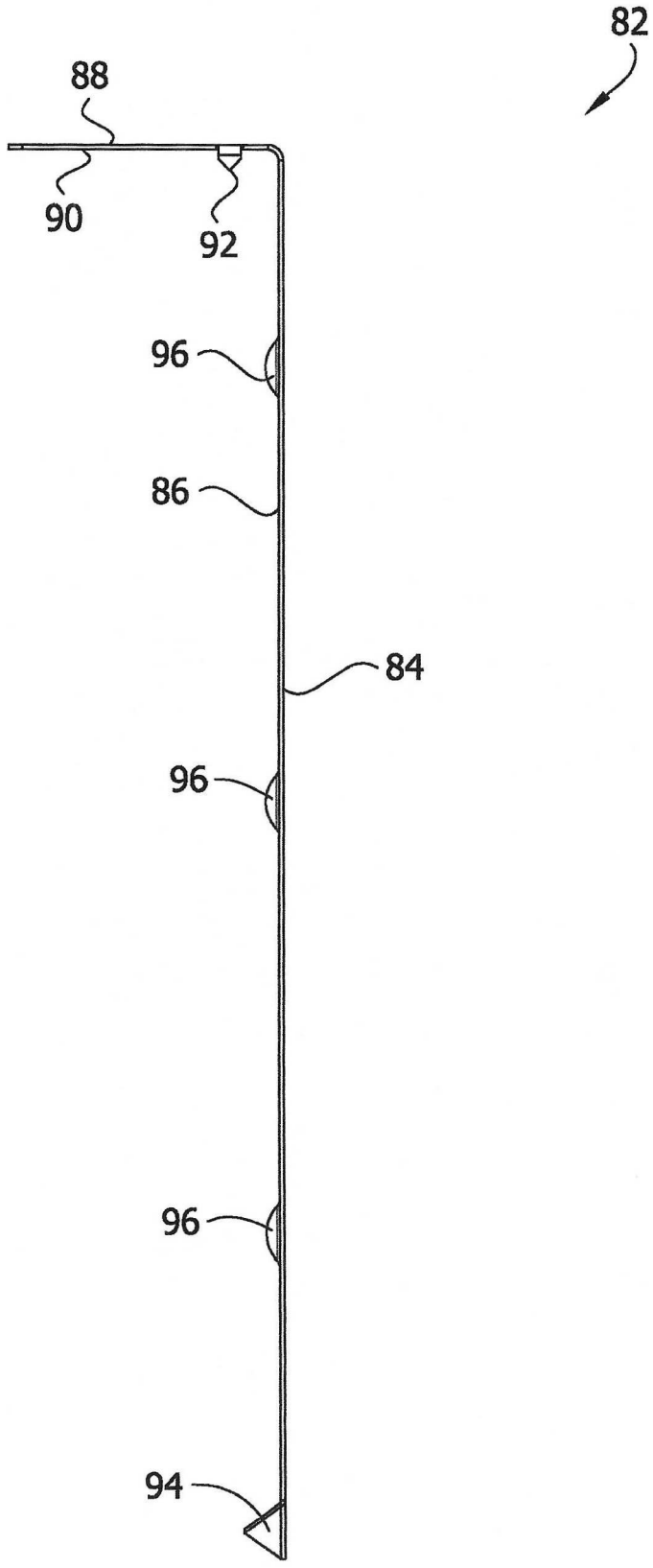
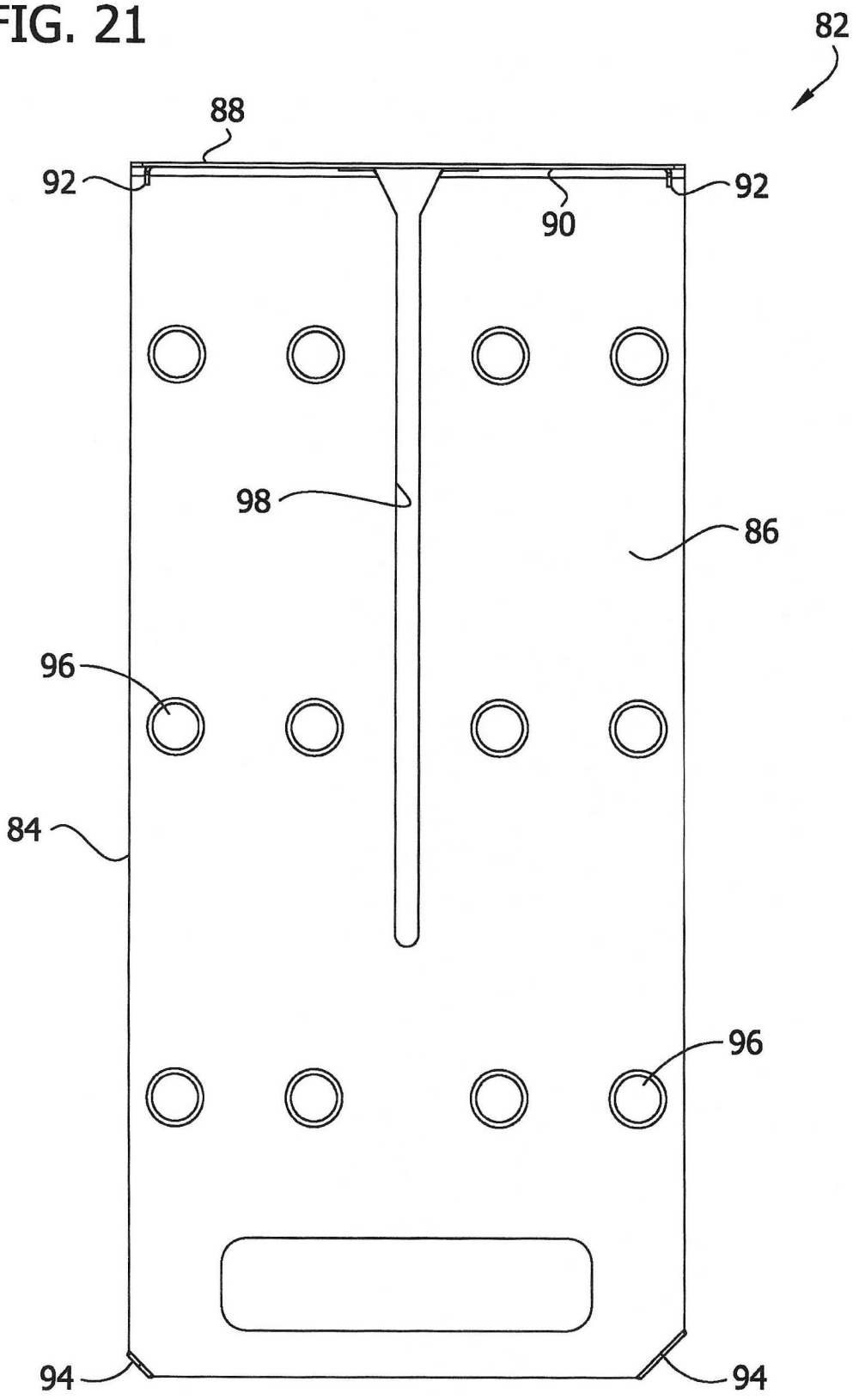


FIG. 21



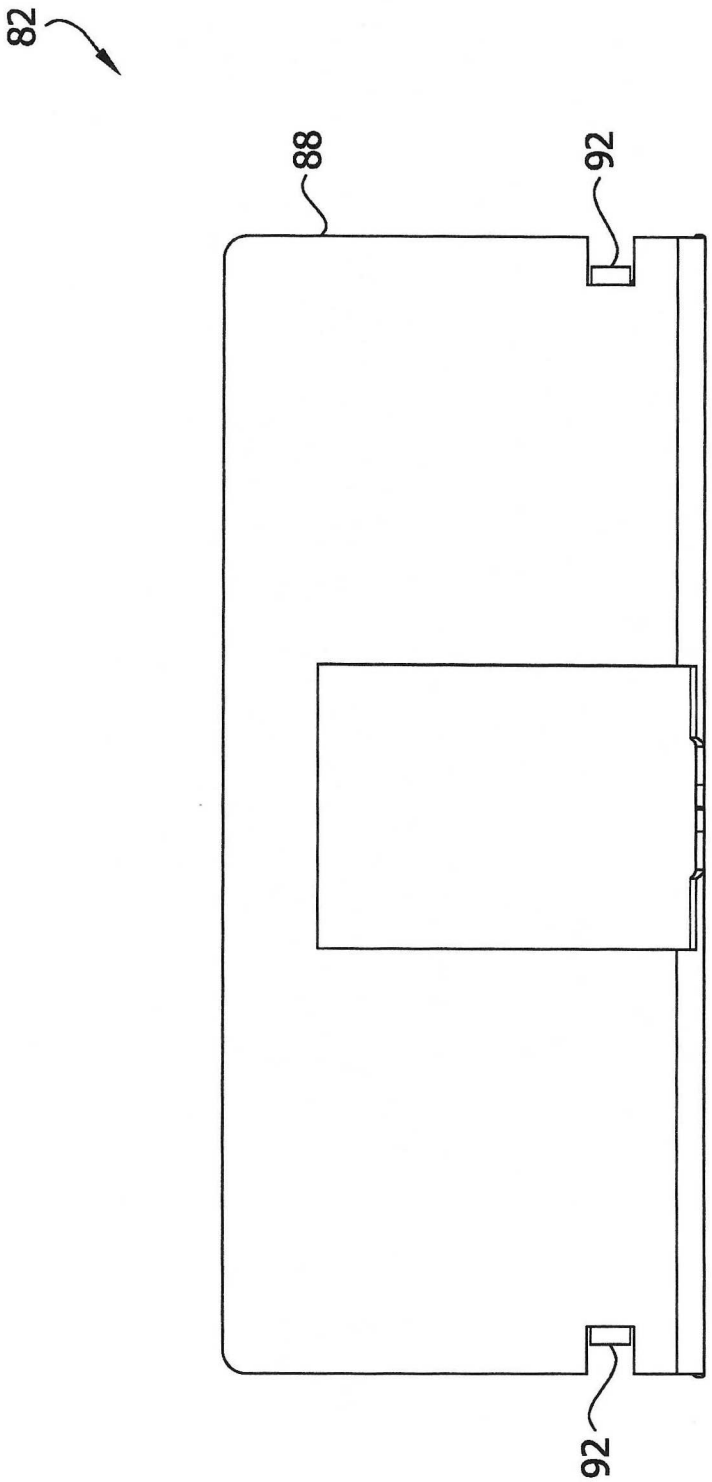


FIG. 22

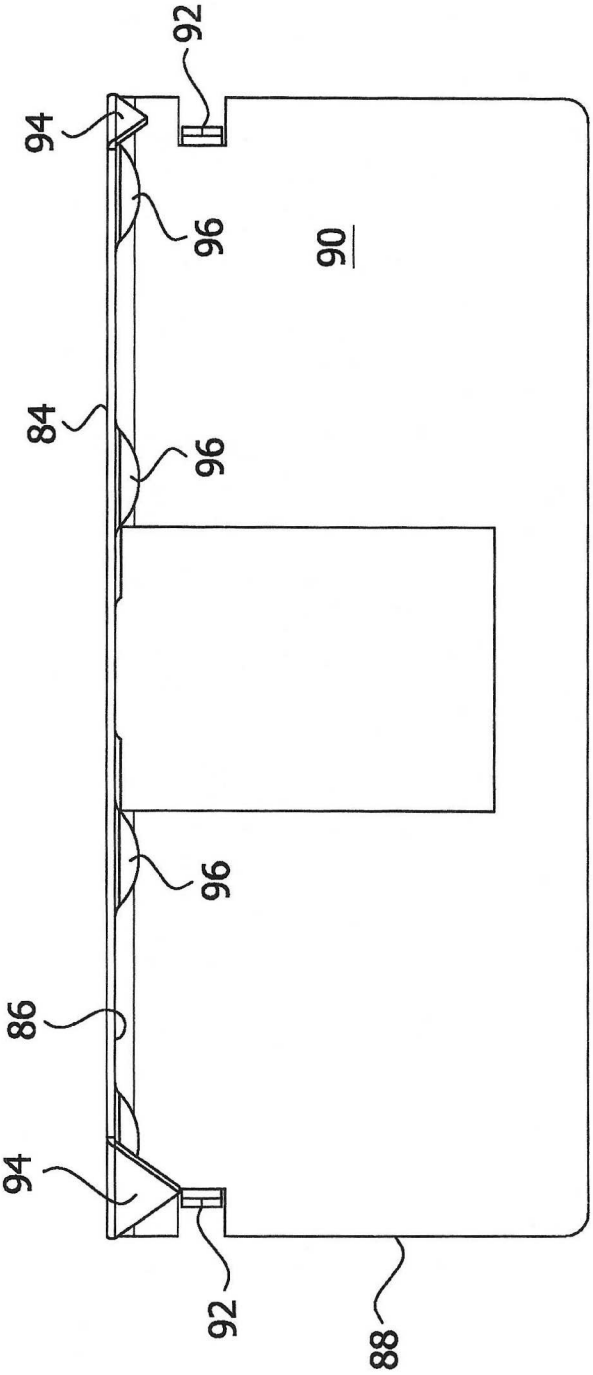


FIG. 23

FIG. 24

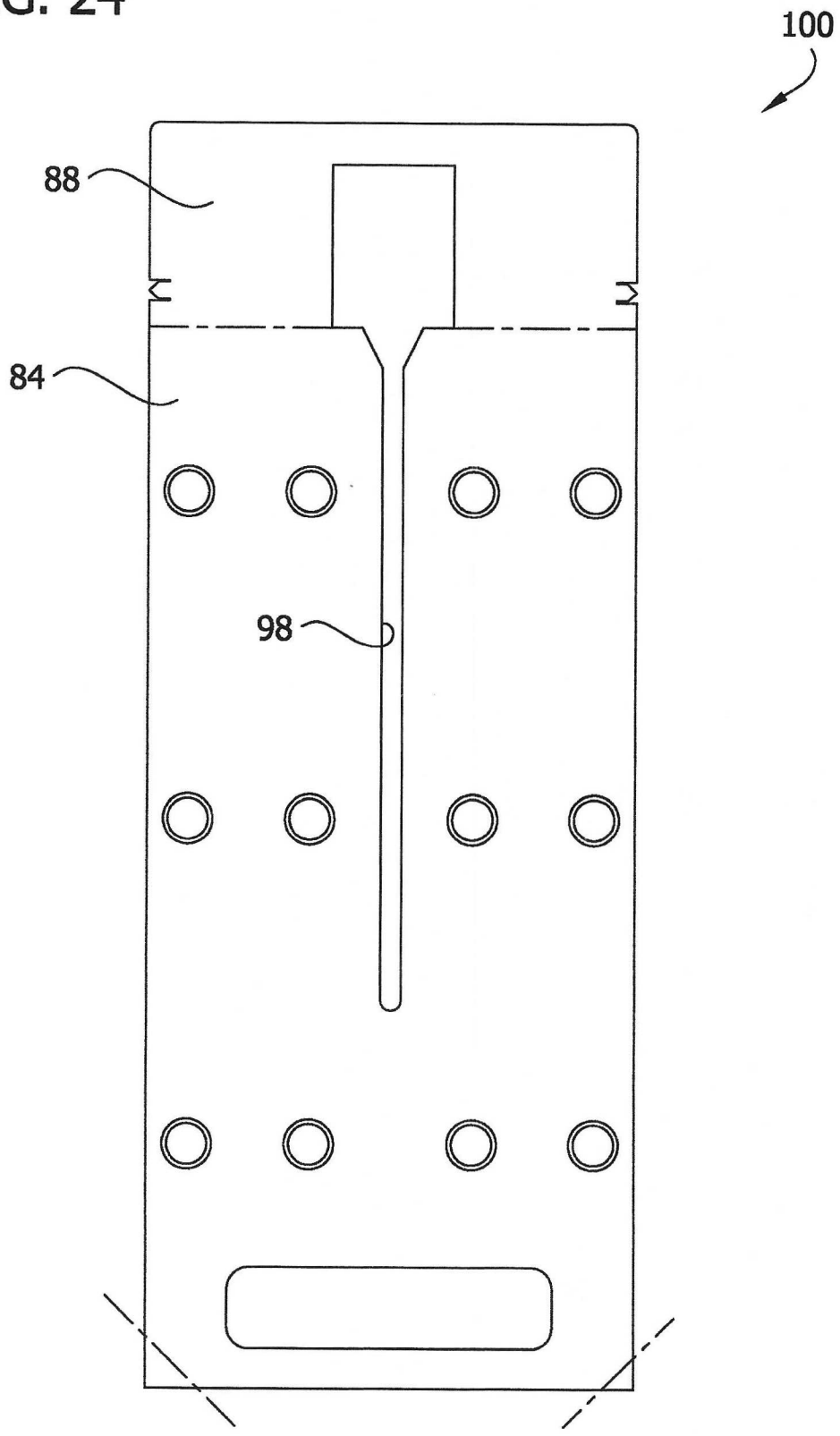


FIG. 25

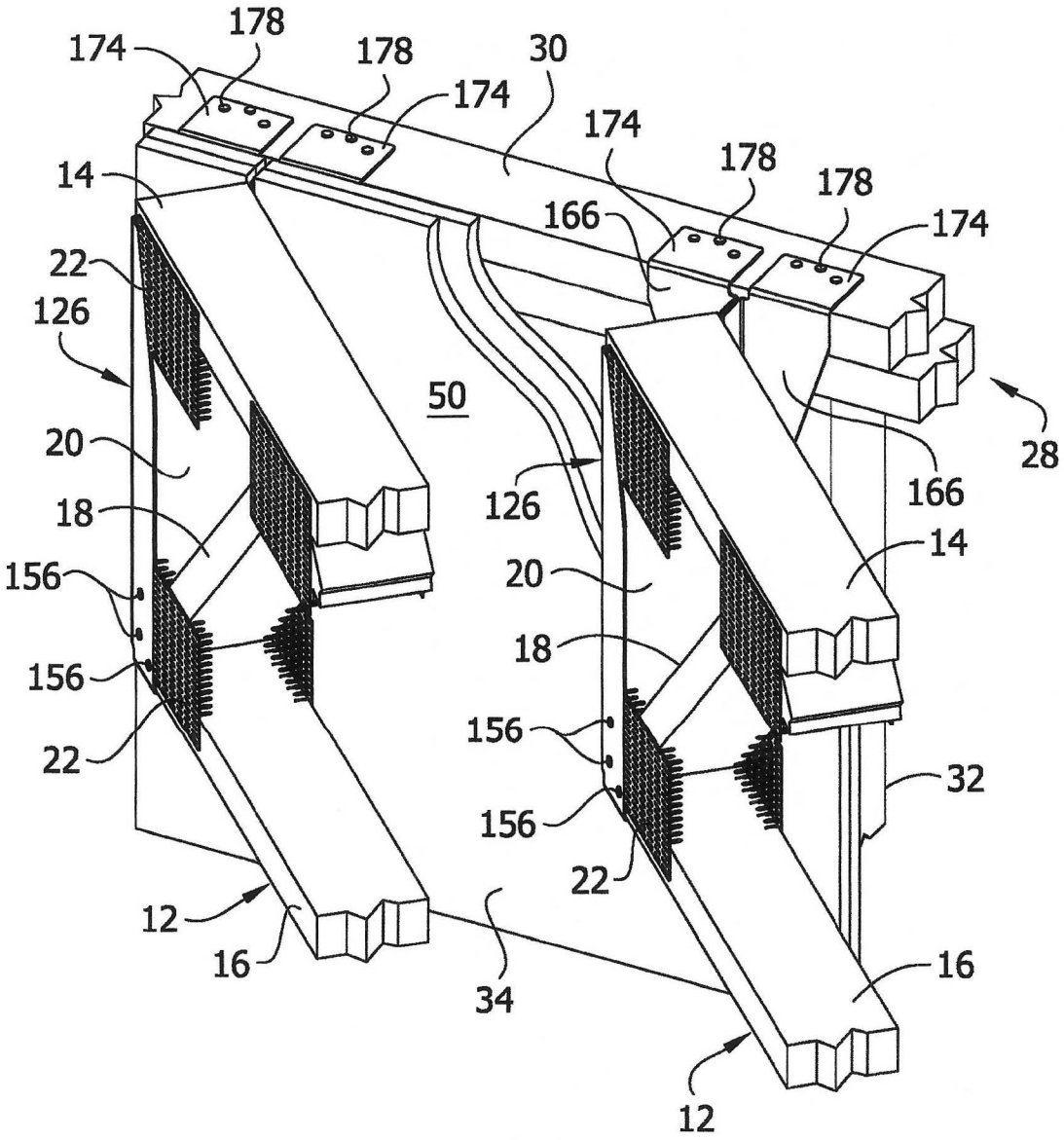

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FIG. 26

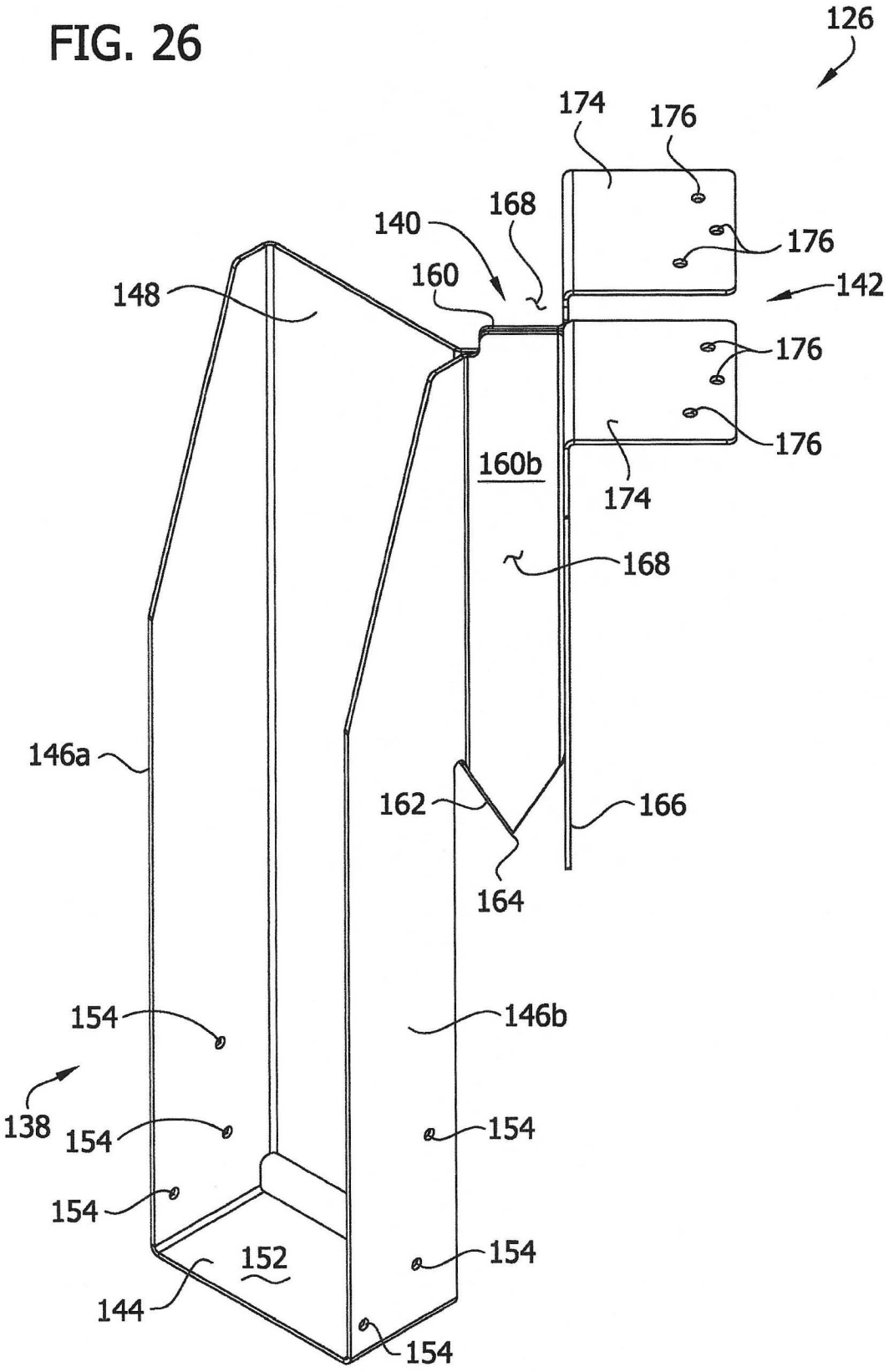
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FIG. 27

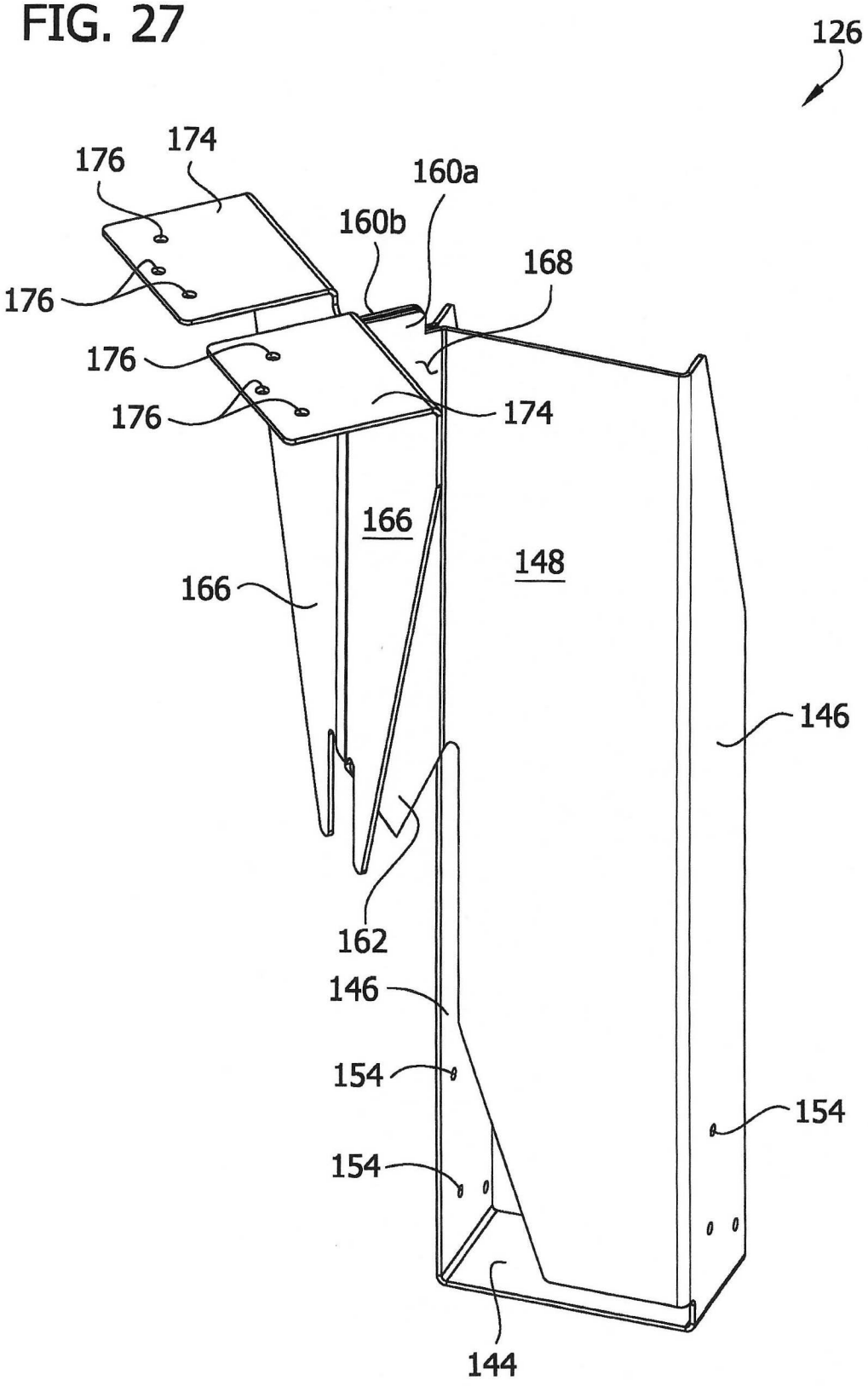
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FIG. 28

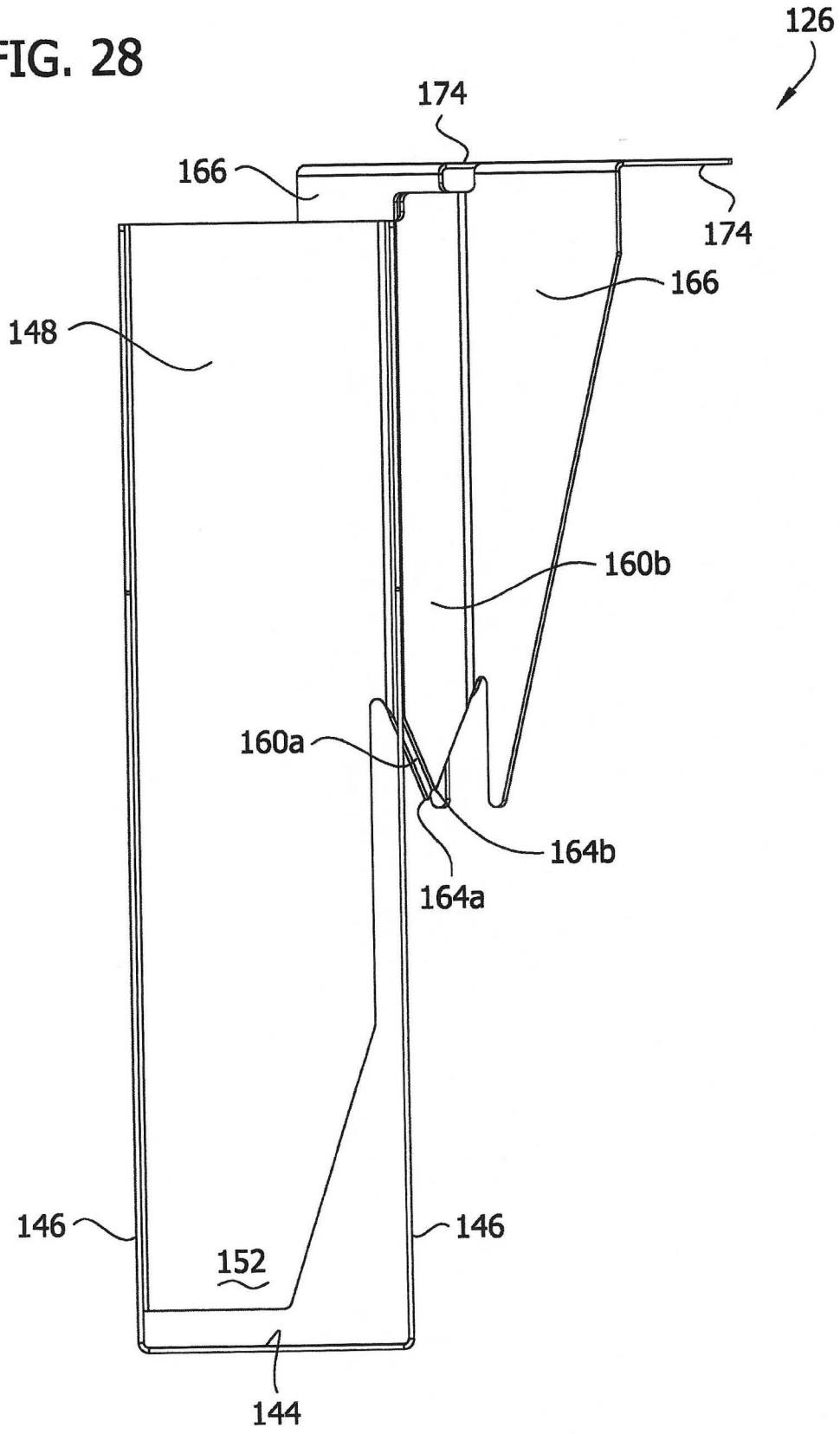


FIG. 29

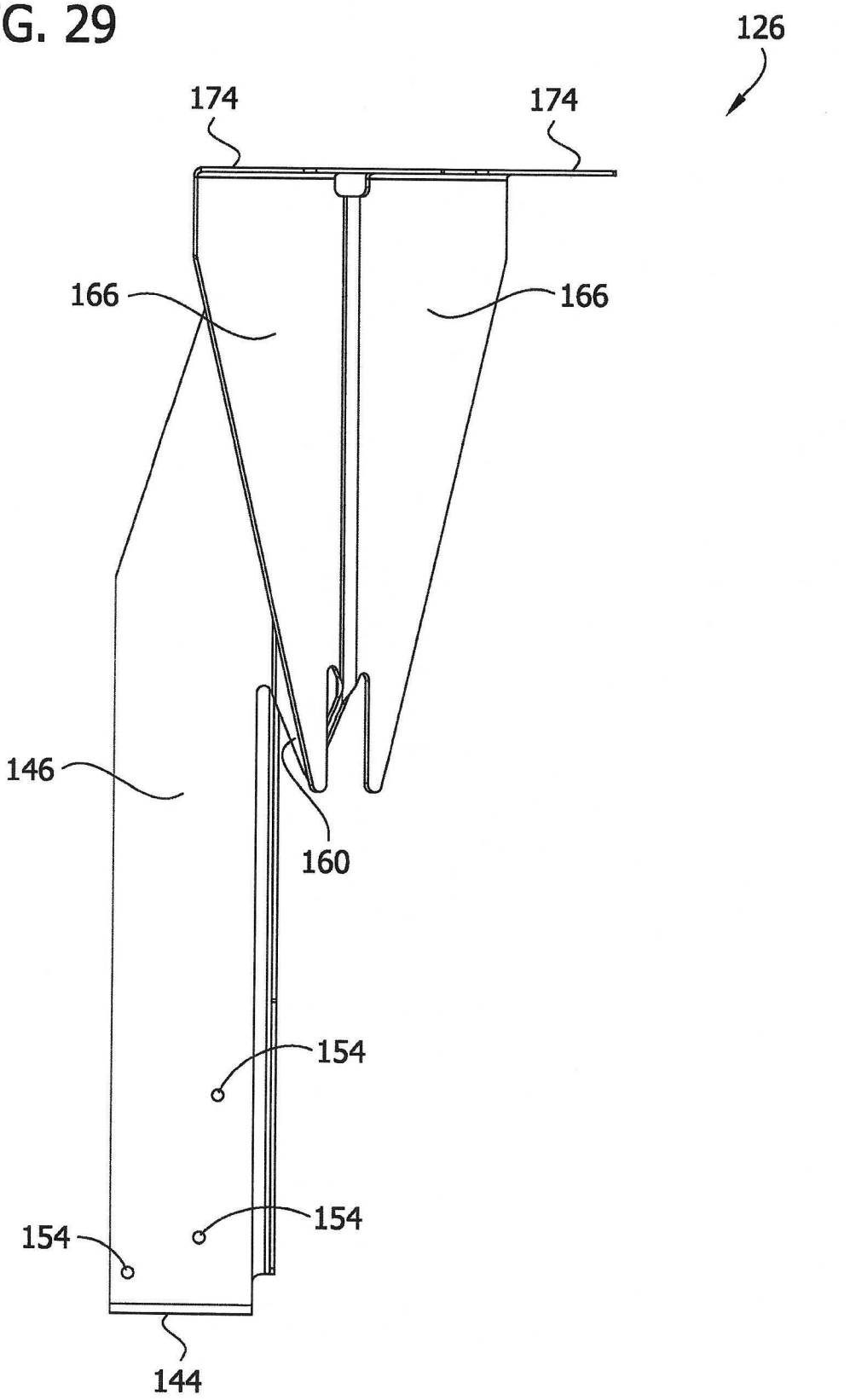


FIG. 30

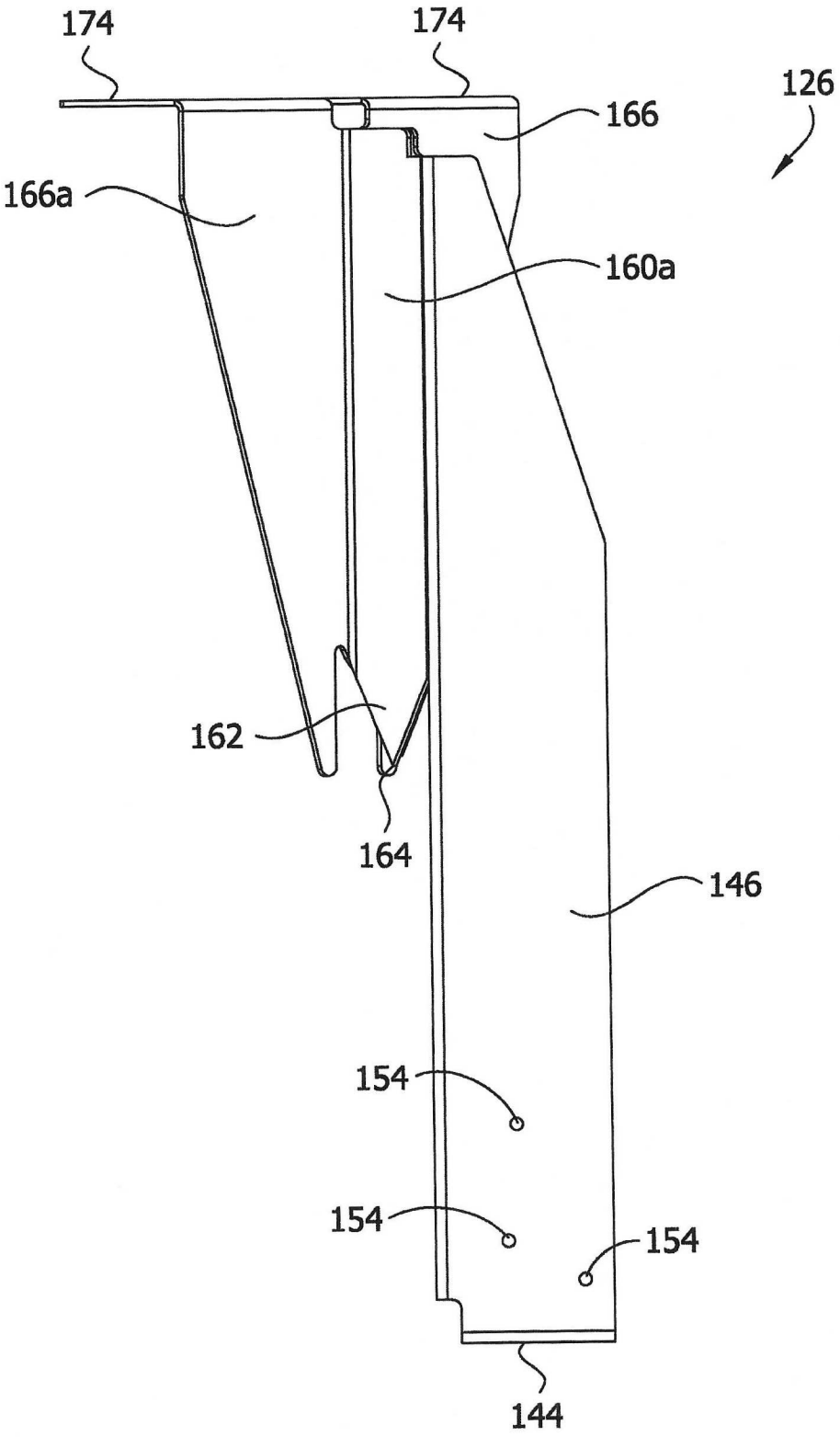
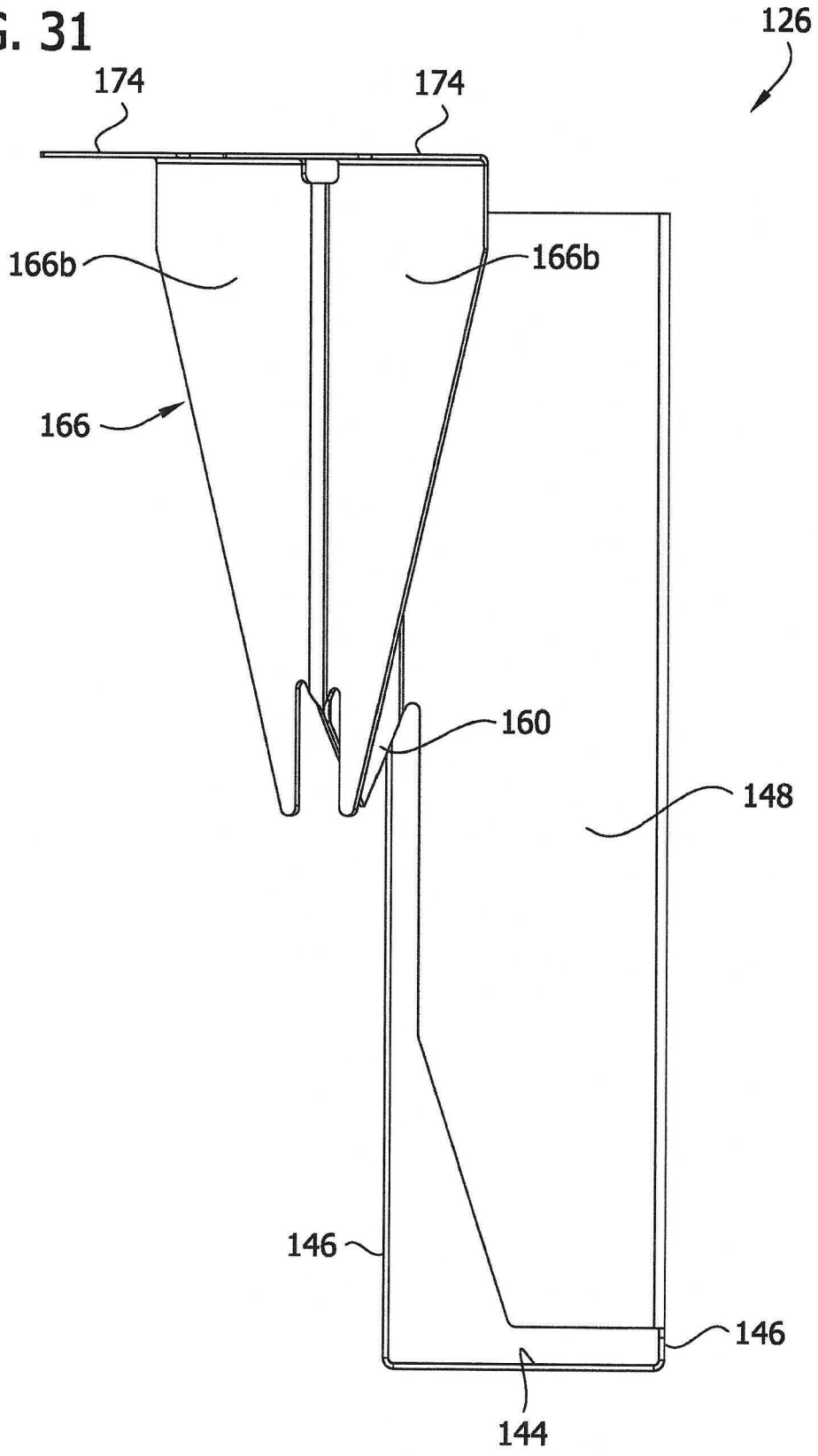


FIG. 31



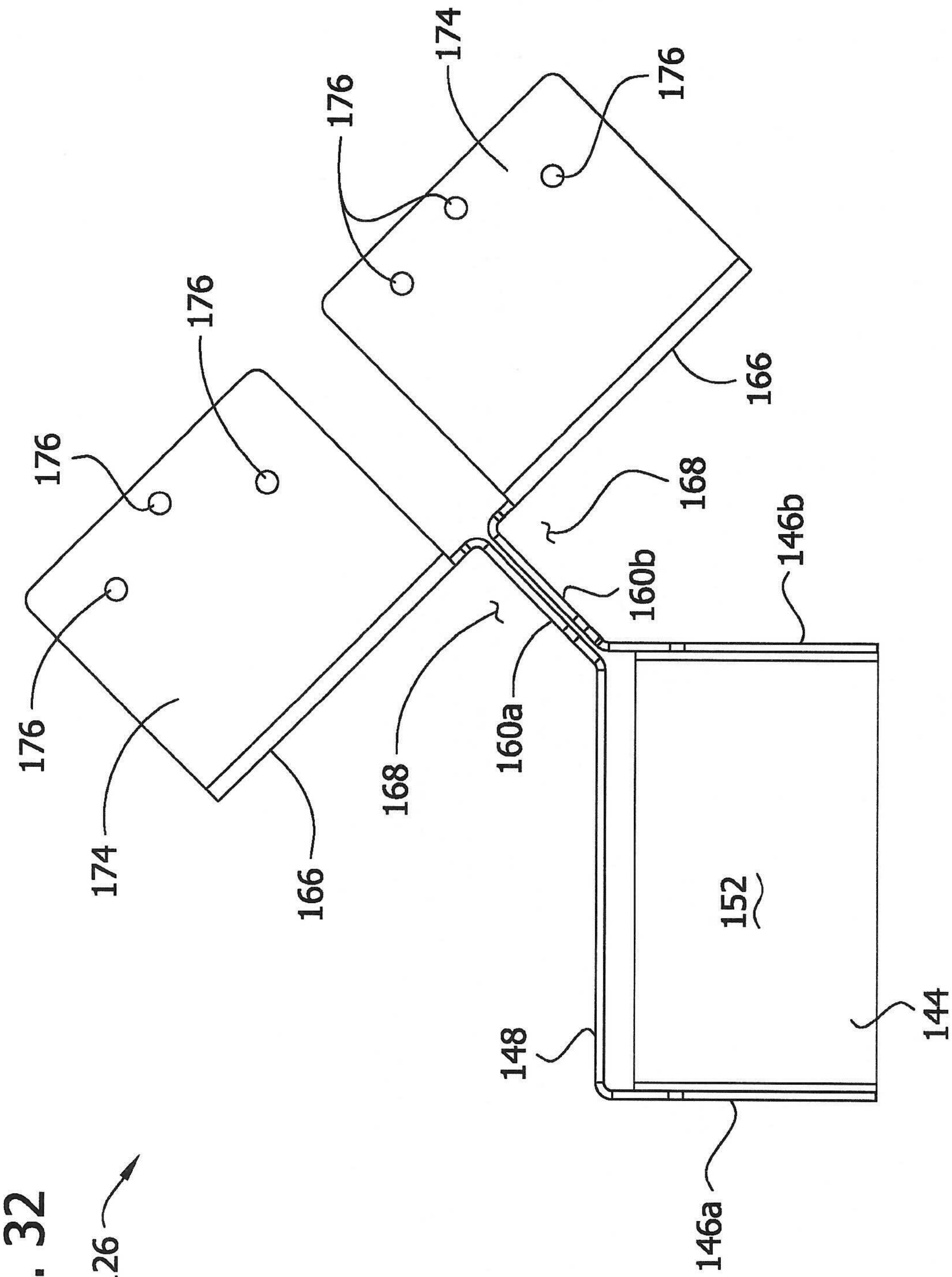

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FIG. 32

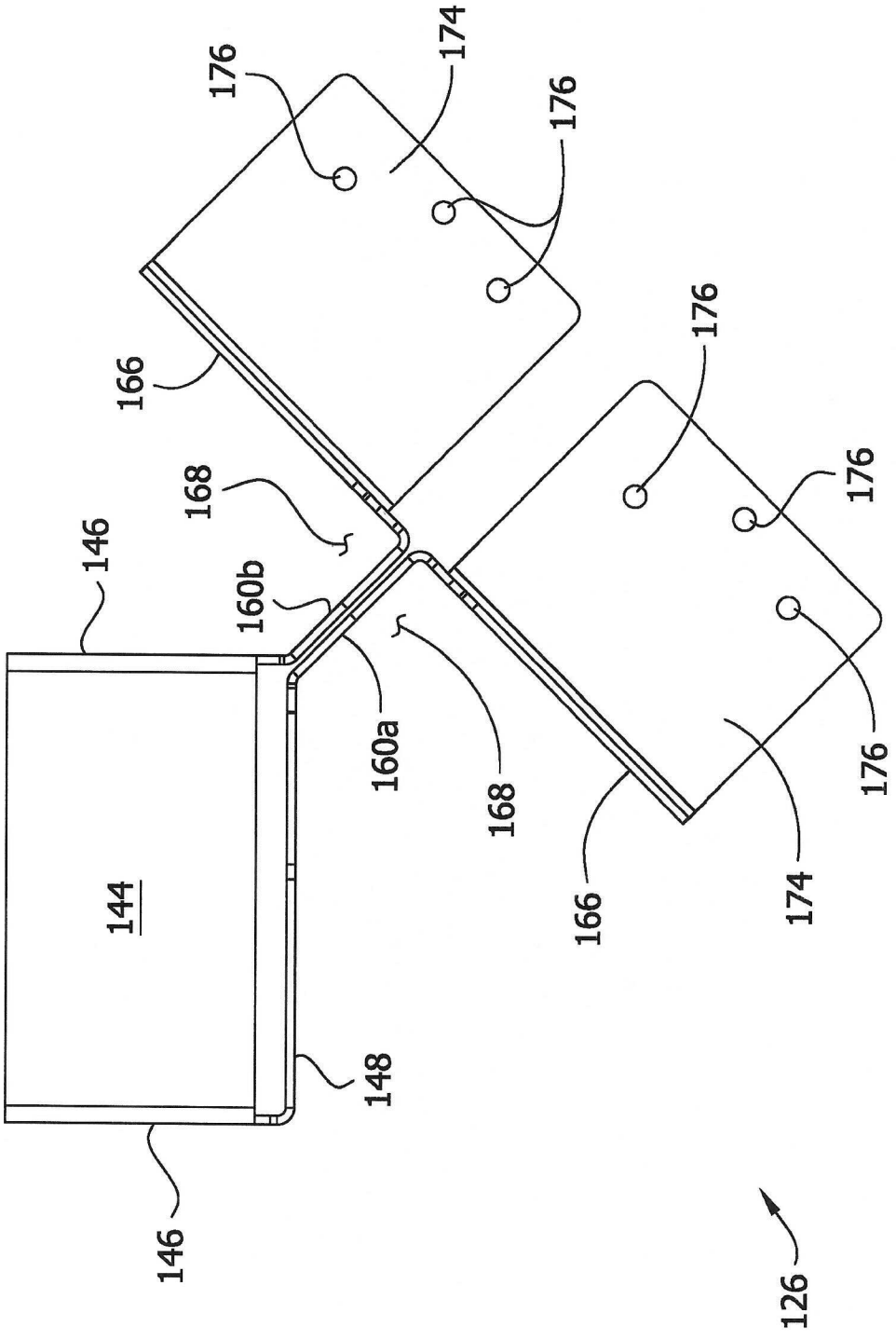
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FIG. 33

FIG. 34

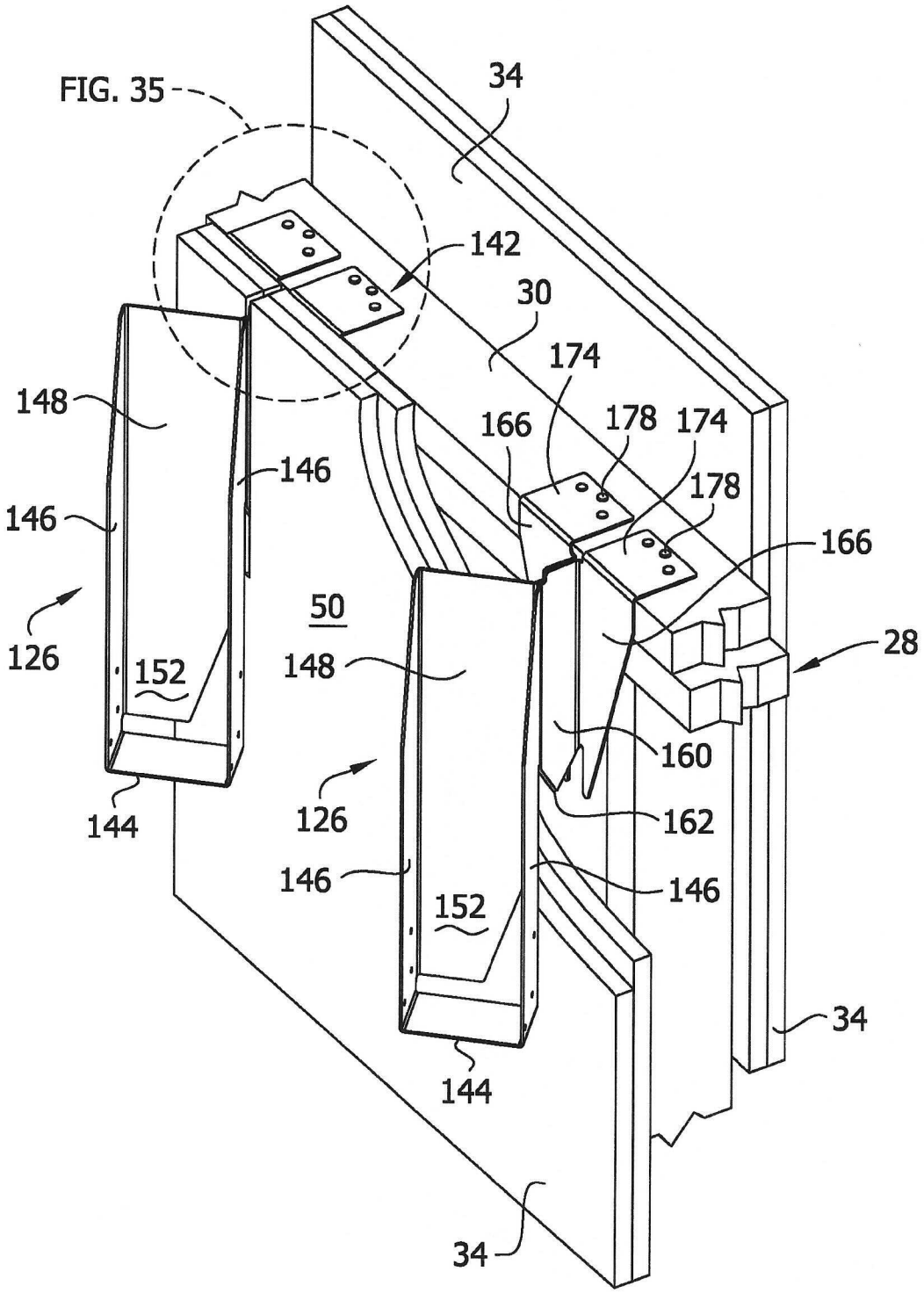
FIG. 35
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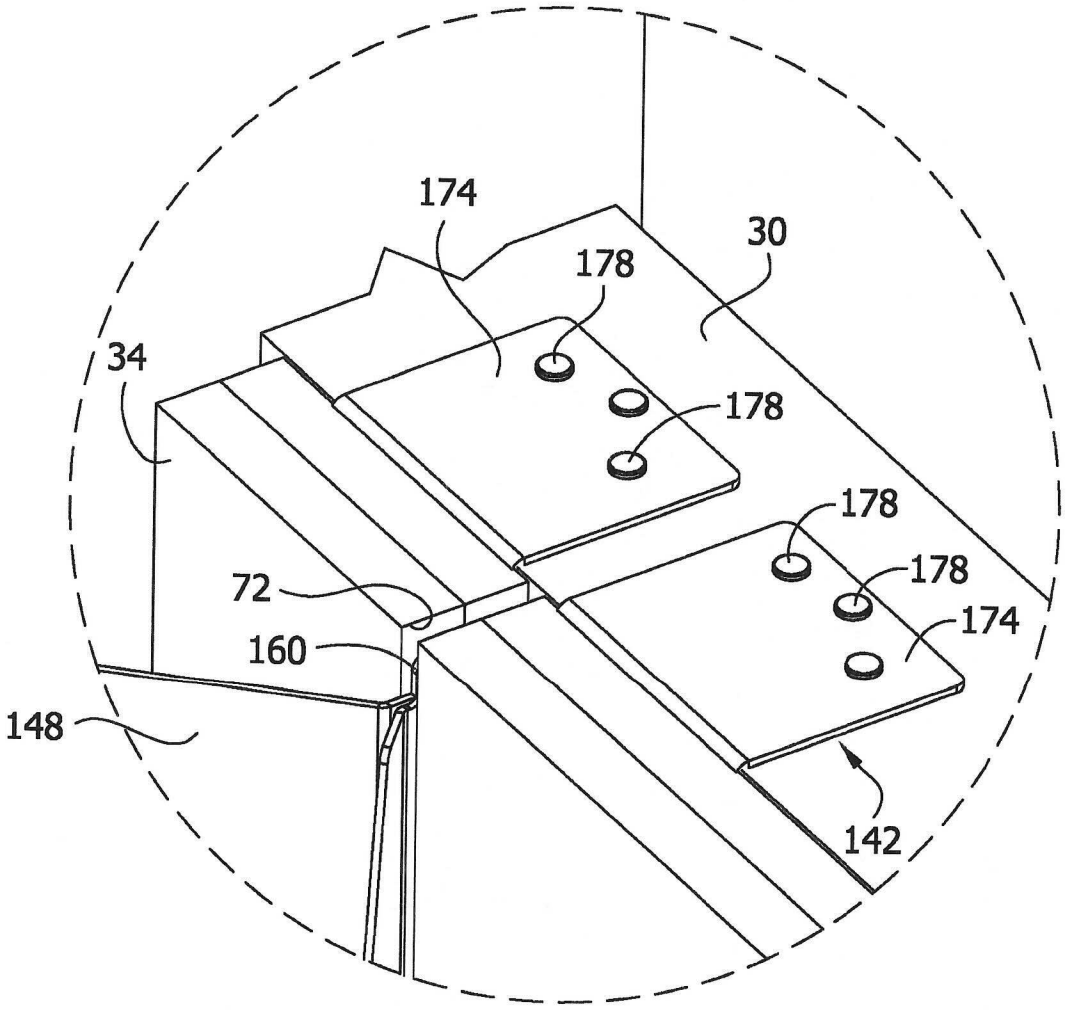
FIG. 35



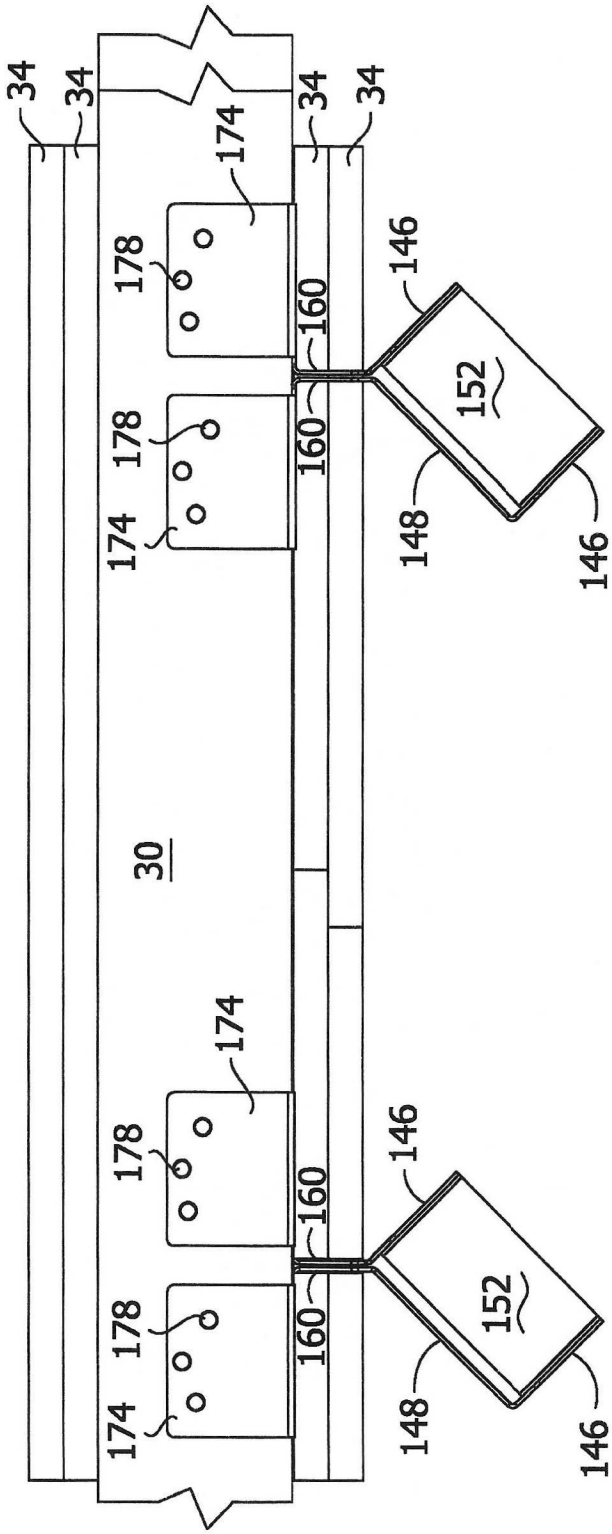

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FIG. 36

FIG. 37

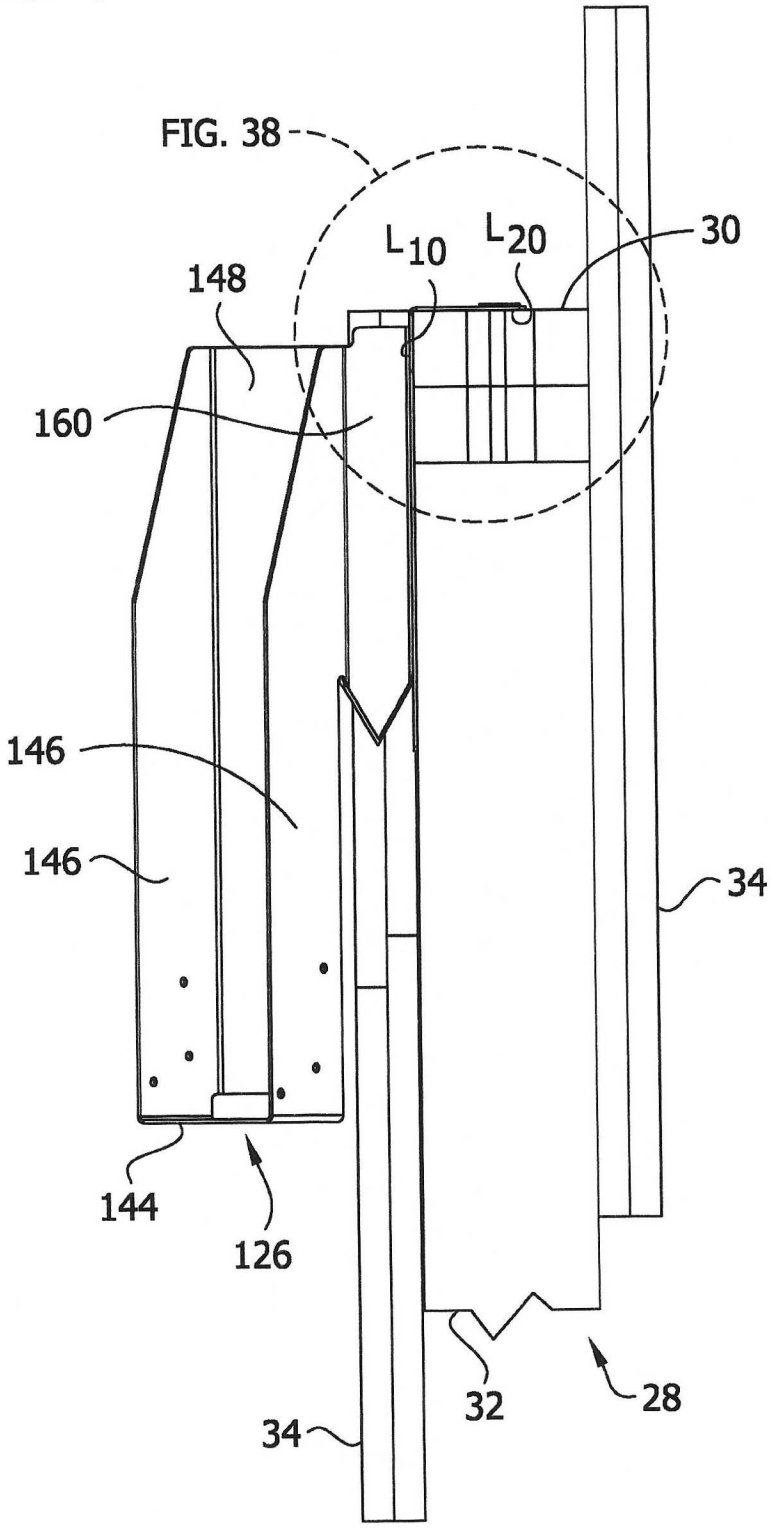
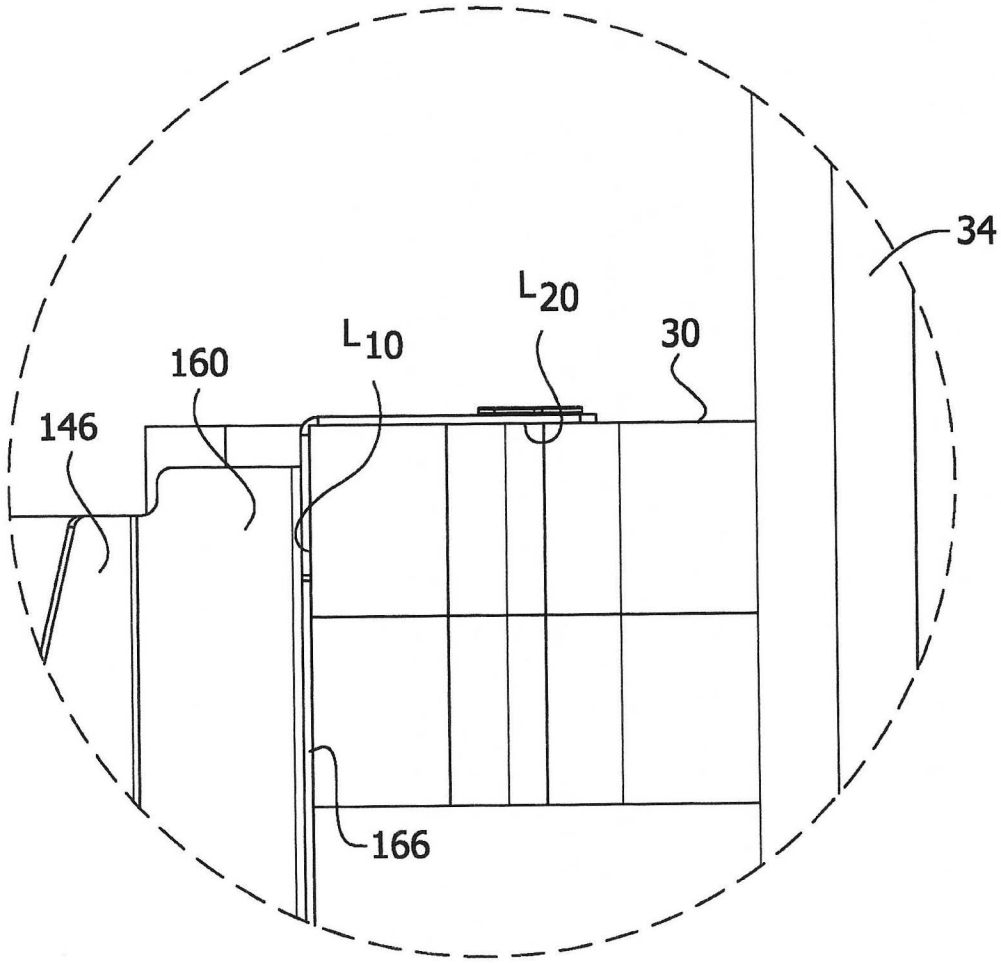


FIG. 38



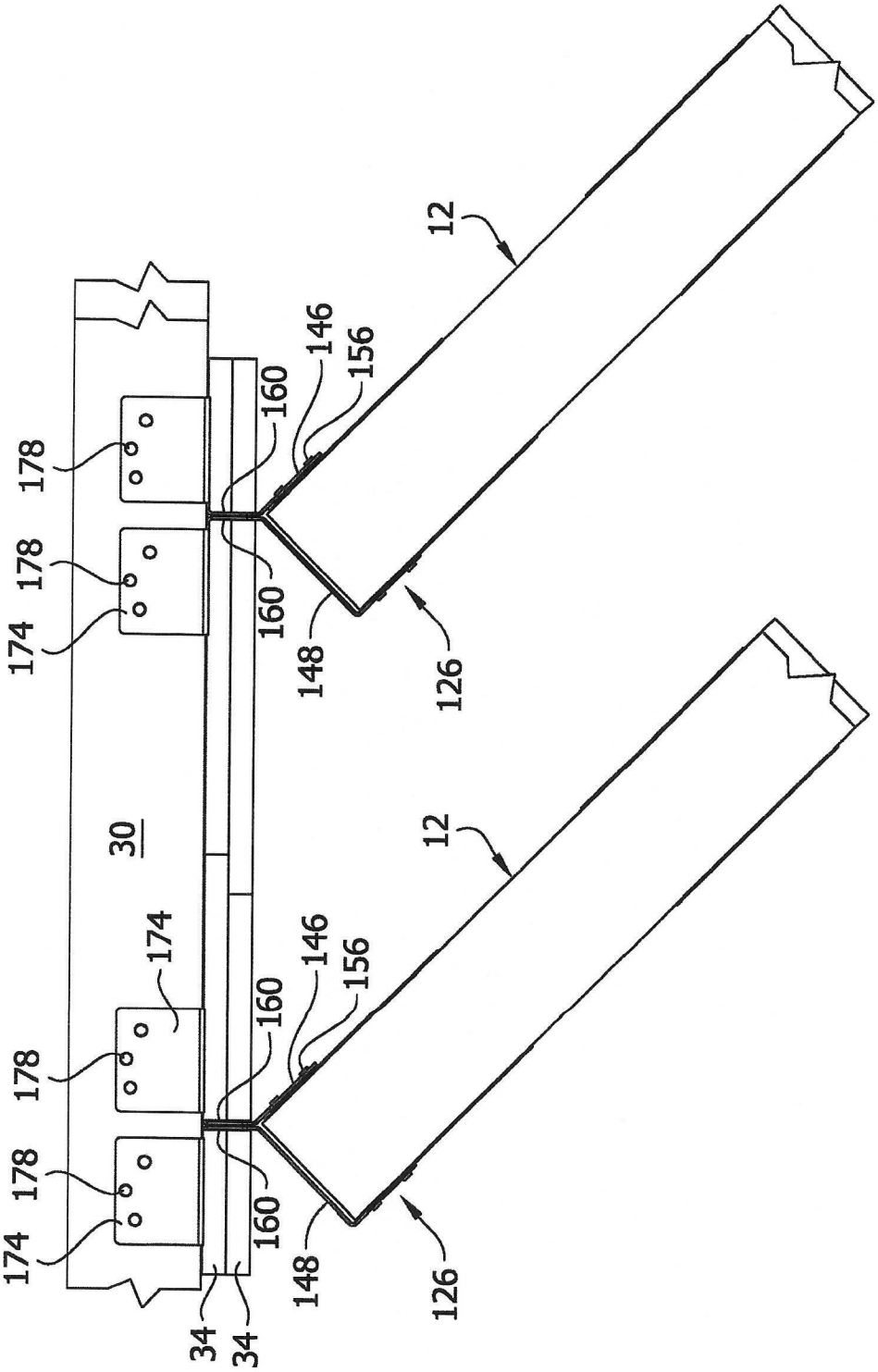

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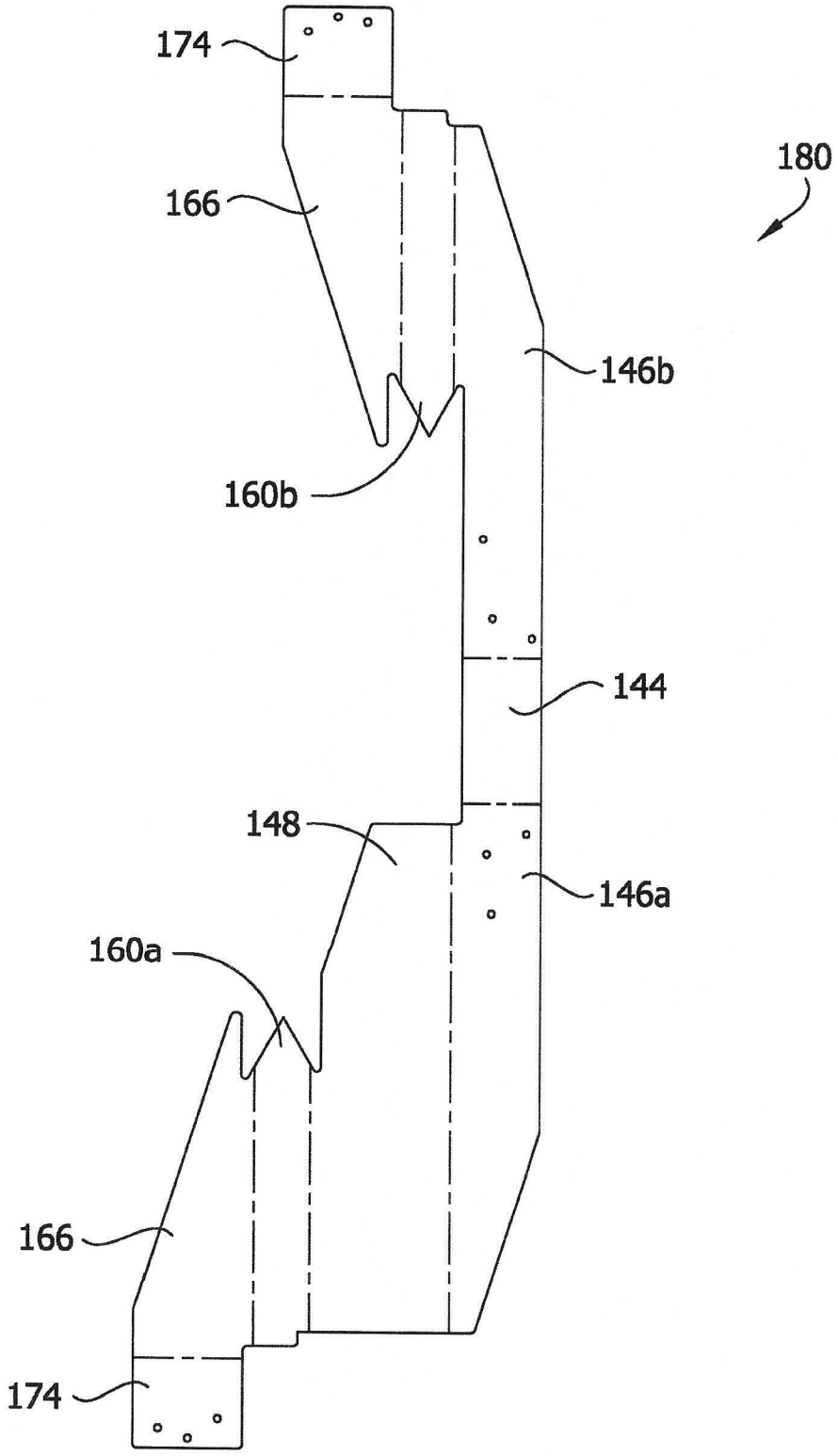
FIG. 39

FIG. 40



METHOD OF CONSTRUCTING A FIRE-RESISTIVE WALL ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 17/235,349, filed Apr. 20, 2021, which is a continuation of U.S. application Ser. No. 16/433,799 filed Jun. 6, 2019, issued as U.S. Pat. No. 11,021,867 on Jun. 21, 2021, U.S. application Ser. No. 16/225,517 filed on Dec. 19, 2018, issued as U.S. Pat. No. 10,316,510 on Jun. 11, 2019, which is a continuation of U.S. application Ser. No. 15/675,409, filed Aug. 11, 2017, issued as U.S. Pat. No. 10,184,242 on Jan. 22, 2019, which is a continuation of U.S. application Ser. No. 14/555,049, filed Nov. 26, 2014, issued as U.S. Pat. No. 10,024,049 on Jul. 17, 2018, which claims priority to U.S. Provisional Application No. 61/922,531, filed Dec. 31, 2013, the entirety of which are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention generally relates to connections for structures, and more specifically, a truss hanger for connecting a truss to a wall including fire retardant sheathing.

BACKGROUND

The use of fire separation walls in structures, such as in multifamily housing, is commonplace. Often, fire separation is required to be continuous along the walls between adjoining units to prevent fire from spreading between the adjoining units in a multifamily structure. For some types of construction, the building codes also require exterior walls to be fire rated. Typically, gypsum board is used as a fire retardant sheathing along these walls. Floor trusses or joists are attached to or hung from the walls including the gypsum board, but cannot be hung from the gypsum board itself. The trusses or joists must therefore be attached to the wall framing. A cutout for the entire cross section of the truss leaves a large discontinuity in the fire retardant sheathing. However, building codes require that the fire separation wall maintain a certain fire resistant rating. Thus, the integrity of the fire retardant sheathing should be maintained and interruptions of the sheathing kept to a minimum.

SUMMARY

In one aspect of the present invention, a hanger for connecting a structural component to a wall having sheathing mounted thereon includes a channel-shaped portion configured to receive the structural component. The channel shaped portion includes a bottom wall, side walls extending from opposite edges of the bottom wall and a back wall. The bottom wall, side walls and back wall are sized and arranged to receive an end of the structural component for supporting the end of the structural component. A connection portion includes a top flange extending away from the back wall of the channel-shaped portion in a direction opposite to the bottom wall of the channel-shaped portion. The top flange is configured for attachment to a top surface of a top plate of the wall. The connection portion further includes a back flange extending from an edge of the top flange in a direction toward the bottom wall of the channel-shaped portion. The back flange of the connection portion faces the back wall of the channel-shaped portion and the back flange and back wall define a space sized to receive the sheathing between the back flange and the back wall. An extension portion extends from the channel-shaped portion to the connection portion and interconnects the channel-shaped portion and the connection portion. The extension portion separates the back wall of the channel-shaped portion from the back flange of the connection portion to define the space sized to receive the sheathing.

In another aspect pf the present invention a hanger for connecting a structural component to a wall adapted to have sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the structural component. An extension portion extends from the channel-shaped portion and is configured to extend through the sheathing to engage the wall at a first location. The extension portion includes extension flanges extending from the channel-shaped portion forming a bend between each extension flange and the channel-shaped portion. Each of the extension flanges is configured to extend through the sheathing. A connection portion is fixed in position relative to the channel-shaped portion such that that channel-shaped portion does not rotate relative to the connection portion. The connection portion is configured for attachment to the wall at a second location spaced from the first location. The extension flanges define planar surfaces disposed in opposed face-to-face relation between the connection portion and the channel-shaped portion.

In another aspect of the present invention, a truss hanger for connecting a truss to a wall adapted to have fire resistant sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the truss. The channel-shaped portion includes a base sized and shaped for receiving a truss chord of the truss thereon, side panels extending upward from the base, and a back panel. The back panel extends orthogonally from one of the side panels. An extension portion extends from the channel-shaped portion and is configured to extend through the fire resistant sheathing. The extension portion includes extension flanges. Each of the extension flanges extends away from the base of the channel-shaped portion. A connection portion includes a top flange extending away from the back panel of the channel-shaped portion in a direction opposite to the base of the channel-shaped portion. The top flange is configured for attachment to a top surface of a top plate of the wall. The connection portion further includes a back flange extending from an edge of the top flange in a direction toward the base of the channel-shaped portion.

A hanger for connecting a structural component to a wall having sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the structural component. An extension portion is configured to be disposed at least partially in the sheathing. A connection portion is configured for attachment to the wall.

Other objects and features will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary perspective of adjacent floor trusses connected to a wall having fire retardant sheathing by truss hangers that extend through the sheathing;

FIG. **2** is a perspective of a truss hanger according to a first embodiment of the present invention;

FIG. **2A** is a rear perspective of the truss hanger;

FIG. **3** is a front elevation thereof;

FIG. **4** is a right side elevation thereof;

FIG. **5** is a left side elevation thereof;

FIG. **6** is a rear elevation thereof;

FIG. **7** is a top plan thereof;

FIG. **8** is a bottom plan thereof;

FIG. **9** is a perspective of a wall having fire retardant sheathing with a slot cut in the sheathing to receive the truss hanger;

FIG. **10** is the perspective of FIG. **9**, but showing two of the truss hangers mounted thereon;

FIG. **10**A is an enlarged fragmentary perspective of FIG. **10**;

FIG. **11** is a top plan of FIG. **10**, illustrating the truss hanger extending through the fire retardant sheathing;

FIG. **12** is a perspective similar to FIG. **10**, but showing a floor truss positioned for mounting in the truss hanger;

FIG. **13** is a side elevation of FIG. **12**;

FIG. **13**A is an enlarged fragmentary perspective of FIG. **13** with a portion of the fire retardant sheathing broken away;

FIG. **14** is the perspective of FIG. **10**, but showing floor trusses mounted in the truss hangers;

FIG. **14**A is an enlarged fragmentary perspective of FIG. **14**;

FIG. **15** is a top view of a stamped metal blank for forming a truss hanger according to the present invention;

FIG. **16** is a perspective of a slot template for use in cutting the slot in the sheathing to receive the truss hanger;

FIG. **17** is a rear perspective of the slot template;

FIG. **18** is a front elevation thereof;

FIG. **19** is a right side elevation thereof;

FIG. **20** is a left side elevation thereof;

FIG. **21** is a rear elevation thereof;

FIG. **22** is a top plan thereof;

FIG. **23** is a bottom plan thereof;

FIG. **24** is a front view of a stamped metal blank for forming the slot template;

FIG. **25** is a fragmentary perspective of adjacent floor trusses connected at an angle to a wall having fire retardant sheathing by truss hangers of a second embodiment that extend through the sheathing;

FIG. **26** is a perspective of one of the truss hangers of FIG. **25**;

FIG. **27** is a rear perspective thereof;

FIG. **28** is a front elevation thereof;

FIG. **29** is a right side elevation thereof;

FIG. **30** is a left side elevation thereof;

FIG. **31** is a rear elevation thereof;

FIG. **32** is a top plan thereof;

FIG. **33** is a bottom plan thereof;

FIG. **34** is a perspective of a wall and the two truss hangers mounted thereon with parts broken away;

FIG. **35** is an enlarged fragmentary perspective of FIG. **34**;

FIG. **36** is a top plan of FIG. **34**, illustrating the truss hangers extending through the fire retardant sheathing;

FIG. **37** is a side elevation of FIG. **34**;

FIG. **38** is an enlarged fragment of FIG. **37**;

FIG. **39** is a top plan similar to FIG. **36**, but showing a floor truss mounted in each truss hanger; and

FIG. **40** is a front view of a stamped metal blank for forming a truss hanger according to the present invention.

Corresponding reference characters indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION

Referring to FIG. **1**, a first embodiment of a connection system for a fire separation wall is shown generally at **10**.

Floor trusses generally indicated at **12** each include truss members (broadly, "wooden structural members") including a top chord **14**, a bottom chord **16**, and web members **18** joining the top and bottom chords. Each floor truss also includes end members **20** at each end joining the top and bottom chords **14**, **16** (only one end of each truss is shown). The truss members can be joined by nail plates **22** or by any other suitable fastening structure. The number and orientations of the web members **18** and chords **14**, **16** may vary from the illustrated embodiment without departing from the scope of the invention, as a truss hanger **26** according to the present invention is readily applicable to other truss configurations (e.g. a roof truss). Moreover, the hanger **26** may be used to connect structural components other than trusses to a wall or other part of a structure. The hanger can be used to support other wood framing members such as solid sawn or structural composite lumber.

As seen in FIG. **1**, a wall **28** includes a top member or plate **30** and support members or studs **32** (only one stud may be seen in FIG. **1**). As illustrated, the top plate **30** is formed by two 2×4's in stacked relation. Fire retardant sheathing **34** is mounted on both sides of the wall **28**, as illustrated. In one embodiment, the fire retardant sheathing is gypsum board, such as two layers of 5/8" gypsum board mounted on each side of the wall **28** as illustrated, although other configurations of fire retardant sheathing are within the scope of the present invention. Other wall configurations, including different wall constructions and materials, are within the scope of the present invention. For example, the truss hangers **26** can be used with any wall assembly or fire-rated wall assembly, such as a 2-hour fire-resistive wall assembly. The floor trusses **12** are mounted on the wall **28** adjacent the fire retardant sheathing **34** by the truss hangers **26**. The truss hangers **26** extend through a narrow slot in the fire retardant sheathing **34** to maintain the integrity and fire retardant characteristics of the fire separation wall.

Referring to FIGS. **2-8**, the truss hanger **26** includes a channel-shaped portion **38**, an extension portion **40**, and a connection portion **42**. The channel-shaped portion **38** is configured to receive the floor truss **12**. The channel-shaped portion **38** includes a seat or base **44** and a pair of side panels **46** extending upward from the base. When installed, the base **44** is generally horizontal, and the side panels **46** extend generally vertical from the base. A back panel **48** extends from each of the side panels **46**. Each back panel **48** is generally perpendicular to both the side panels **46** and the base **44**. When installed, each back panel **48** extends generally parallel to an interior face **50** of the fire retardant sheathing **34**. The base **44**, side panels **46**, and back panels **48** form a channel **52** configured to receive the floor truss **12**.

As seen in FIGS. **1** and **12-14**A, the floor truss **12** is received in the channel **52** to attach the floor truss to the wall **28**. The bottom chord **16** of the floor truss **12** engages and rests upon (i.e., is supported by) the base **44**. The end member **20** of the floor truss **12** is positioned against the back panels **48** between the side panels **46**. The truss hanger **26** includes fastening structure for attaching the floor truss **12** to the truss hanger. Fastening structure can be of any type known in the art for attaching a connector to a wooden structural member, such as nailing teeth (not shown) struck from the material of the hanger. In the illustrated embodiment, the fastening structure comprises a hole to allow for insertion of a fastening member. More specifically, in one embodiment the fastening structure comprises nail holes **54** in the side panels **46** of the truss hanger **26**, and the fastening member comprises a nail **56** (see FIG. **12**). In the illustrated embodiment, nail holes **54** are positioned on each of the side

panels **46** so that nails **56** can be inserted into both the bottom chord **16** and the end member **20** of the floor truss **12** to attach the hanger **26** to the floor truss **12**.

Referring again to FIGS. **2-8**, the extension portion **40** includes two extension flanges **60** configured to extend through the fire retardant sheathing **34**. Each flange **60** extends from one of the back panels **48**. The flanges **60** are positioned in opposed, face-to-face relation, and preferably engage each other along a juncture. Each flange **60** extends generally perpendicular from the corresponding back panel **48** and generally parallel to the side panels **46**. At a bottom edge, each flange **60** includes a driving point **62**. Each of the driving points **62** is generally triangular and includes a pointed tip **64**. As seen in FIGS. **3** and **6**, the tips **64** of the driving points **62** are vertically offset from each other. As illustrated, the tip **64***a* of one flange **60***a* extends vertically below the tip **64***b* of the other flange **60***b*. In one embodiment, the tips **64** are vertically offset from each other about ⅛", although other configurations are within the scope of the present invention, such as tips that are aligned or tips that are offset a smaller or larger amount.

A back flange **66** extends from each of the extension flanges **60**. Each back flange **66** extends generally perpendicular from the extension flange **60** and is oriented generally parallel to the back panels **48**. Referring to FIG. **13**A, the back flanges **66** engage the wall **28** at a first location L_1, which in the illustrated embodiment is a vertical face of the top plate **30** of the wall. The back panels **48**, extension flanges **60**, and back flanges **66** form a pair of sheathing channels **68**. Each sheathing channel **68** is configured to receive a portion of the fire retardant sheathing **34** to secure the sheathing between the hanger **26** and the wall **28**. As seen in FIG. **7**, the sheathing channels **68** extend generally perpendicular to the truss-receiving channel **52**.

As seen in FIGS. **10**A and **11**, the extension flanges **60** extend through a slot **72** in the fire retardant sheathing **34**. Preferably, the slot has an area less than or equal to 6 square inches, and the gap between the extension flanges **60** and the edge of the slot **72** is less than or equal to ⅛". The driving points **62** extend down into the sheathing **34** to further secure the sheathing between the hanger **26** and the wall **28**. A portion of the fire retardant sheathing **34** extends into each sheathing channel **68** and is secured between the back panels **48** and the back flanges **66**.

In one embodiment, the slot **72** in the fire retardant sheathing **34** can be made using a slot template **82** (FIGS. **16-24**). The slot template **82** includes a vertical panel **84** having a rear face **86** configured to engage the interior face **50** of the fire retardant sheathing **34** and a horizontal panel **88** having a bottom face **90** configured to engage a top face of the sheathing. The horizontal panel **88** extends generally perpendicular from the vertical panel **84**. The slot template **82** is configured to be quickly fixed in position on the sheathing **34** for use in cutting the slot **72** to receive the truss hanger **26**. Portions of the slot template **82** are configured to be pressed into the sheathing **34** to locate the template on the sheathing and retain the template in position for cutting the slot **72**. In the illustrated embodiment, the horizontal panel includes prongs **92** that are bent downward for insertion into the top face of the sheathing **34**. Bottom corners **94** of the vertical panel **84** are bent rearward for insertion into the interior face **50** of the sheathing **34**. The prongs **92** and the corners **94** are inserted into the sheathing **34** to retain the template **82** in position for cutting the slot **72**. In addition, the vertical panel **84** optionally includes dimples **96** extending toward the rear face **86** of the vertical panel **84**. The dimples **96** ensure the vertical panel **84** remains slightly spaced from the interior face **50** of the sheathing **34** so the template **82** can be easily removed from the sheathing after the slot **72** is cut.

The template **82** includes a guide slot **98** to guide a cutting tool in cutting the slot **72** in the sheathing **34**. The guide slot **98** extends from a top edge of the vertical panel **84** to a location spaced from a bottom edge of the vertical panel. As illustrated, the guide slot **98** includes a wide, rectangular portion **98***a* in the horizontal panel **88** to ease insertion of a cutting tool into the guide slot. A converging portion **98***b* of the slot **98** in the vertical panel **84** transitions from the wide portion **98***a* to a narrow lower portion **98***c* of the slot. This facilitates entry of the cutting tool into the narrow portion **98***c*. The narrow portion **98***c* of the guide slot **98** is dimensioned to facilitate cutting the slot **72** in the sheathing **34** to a size configured to receive the extension flanges **60** of the truss hanger **26**.

As seen in FIG. **24**, the template **82** described above can be formed as one piece from a metal blank **100** that is stamped from a sheet metal roll and bent into shape. In one embodiment, the template **82** is stamped from 16 gauge steel, although other thicknesses (e.g., 12-18 gauge) and other suitable materials are within the scope of the present invention.

In use, the template **82** is placed on the sheathing **34** in a selected location for a slot **72**. The template can be used to cut the slot **72** in the sheathing **34** either before or after the sheathing is mounted on the wall **28**. The prongs **92** and corners **94** are inserted into the sheathing **34** by tapping with a hand or striking with a hammer or other blunt instrument. Once the template **82** is secured in position on the sheathing **34**, a cutting tool (e.g., a drywall cutout tool) is inserted into the guide slot **98** to cut a slot **72** in the sheathing at the location of the guide slot. In one embodiment, a drywall cutout tool with a ⅛" or ¼" spiral bit is used to cut the slot **72**, although other cutting tools are within the scope of the present invention. After the slot **72** is cut in the sheathing **34**, the template **82** is removed from the sheathing. The sheathing **34** is then configured to receive the truss hanger **26**.

Referring again to FIGS. **2-8**, the connection portion of the hanger includes a pair of connector tabs **74** extending from the back flanges **66**. Each connector tab **74** extends generally perpendicular from one of the back flanges **66**. The connector tabs **74** are generally horizontal when the hanger **26** is installed. The connector tabs **74** are configured to engage an upper surface of the top plate **30** of the wall **28** at a second location L_2 spaced from the first location L_1. The connector tabs **74** can be used to attach the truss hanger **26** to the wall, thereby hanging the floor trusses **12** from the wall. As seen in FIG. **1**, the connector tabs **74** extend over a portion of the top plate **30** of the wall **28**. Each connector tab **74** includes fastening structure, such as nail holes **76**, for insertion of a fastening member, such as nails **78** (see FIGS. **10** and **10**A), to attach the hanger **26** to the wall **28**. In the illustrated embodiment, each connector tab **74** includes three nail holes **76**. Other configurations are within the scope of the present invention, such as a different number of nail holes, or alternate fastening structure such as nailing teeth or other appropriate structure for fastening the hanger to the wall.

The base **44** and back flanges **66** of the truss hanger **26** cooperate to stabilize the truss hanger **26** and protect the fire retardant sheathing **34** under the loads transferred from the truss **12** to the wall **28** by way of the hanger. The channel **52** that receives an end portion of the truss **12** is spaced to the interior of the wall **28** and more particularly to the interior of the second location L_2 where the connector tabs **74** are

attached to an upper surface of the top plate **30**. The vertically downward load of the truss **12** applied to the base **44** of the truss hanger **26** urges the truss hanger **26** to pivot so that the base would move toward the wall **28**, which could damage the fire retardant sheathing **34** and pry out the nails **78** connecting the connector tabs **74** to the upper surface of the top plate **30**. However, this motion is resisted by the engagement of the back flanges **66** with the interior vertical face of the top plate **30** at the first location L_1. Thus, there is a force couple between the base **44** of the hanger **26** carrying the vertical load of the truss **12** and the back panels **48** of the hanger (via engagement of the back flanges **66** with the top plate **30**) engaging the end face of the truss. Accordingly, the truss hanger **26** and truss **12** are stable with minimal disruption of the fire retardant sheathing **34**, even though the truss is held at a distance from the wall **28** by the truss hanger.

As seen in FIG. **15**, a truss hanger **26** as described above can be formed as one piece from a metal blank **80** that is stamped from a sheet metal roll and bent into shape. In one embodiment, the truss hanger **26** is stamped from 12-14 gauge steel, although other suitable materials are within the scope of the present invention. The configuration of the truss hanger **26** of the present invention allows a lighter gauge metal to be used.

In use, the truss hanger **26** is positioned in the slot **72** of the fire retardant sheathing **34** mounted on the wall **28**. As seen in FIGS. **9-14**A, one method of using the truss hanger **26** includes cutting the slot **72** in the fire retardant sheathing **34** (either before or after the sheathing is mounted on the wall). In one embodiment, the slot **72** can be cut using the slot template **82** (either before or after the sheathing **34** is mounted to the wall **28**). The slot can be any suitable length, and in one embodiment is about 10 inches long. The truss hanger **26** is then positioned against the fire retardant sheathing **34** so that the extension flanges **60** extend through the slot **72**. In one embodiment, the hanger **26** is slid downward into place so that the extension flanges **60** extend through the slot **72**, the back flanges **66** are positioned adjacent the wall **28**, and the fire retardant sheathing **34** is positioned in the sheathing channels **68** between the back flanges and the back panels **48**. The hanger connector tabs **74** are fastened to the top plate **30** of the wall **28** by any suitable means, such as by inserting nail **78** through the nail holes **76**. Then, a truss member, e.g. truss bottom chord **16**, is positioned in the truss channel **52** of the hanger **26** (see FIG. **1**), thereby securing the floor truss **12** to the wall **28**. The truss hanger **26** is then fastened to the truss **12** by any suitable means, such as by inserting nails **56** through the nail holes **54** in each side panel **46** of the hanger. The hanger **26** is thus secured to both the truss **12** and the wall **28**, with the fire retardant sheathing **34** secured between the hanger and the wall.

In another embodiment, the truss hangers **26** can be installed without pre-forming the slot **72** in the fire retardant sheathing **34**. More particularly, each hanger **26** can be driven into the sheathing **34**. The driving point **62** of the hanger **26** is positioned against a top edge of the fire retardant sheathing. The hanger **26** is then driven downward into the sheathing **34**, led by the pointed tip **64**. The hanger **26** continues to be driven into the gypsum boards until the connector tabs **74** engage the upper surface of the top plate **30**. In this way, the hanger **26** forms the slot in the sheathing **34**.

In still another embodiment, the truss hangers **26** can be installed on the wall **28** before the sheathing **34** is mounted on the wall. This simplifies construction by allowing the building to be completely framed and roofed before requiring the sheathing **34** to be installed. Trade workers (e.g., mechanical, electrical) therefore have complete access to the wall cavity to install components without interference from the sheathing **34**. The truss hanger **26** is positioned against the wall **28** such that the back flanges **66** engage the wall and the connector tabs **74** engage the top plate **30**. The connector tabs **74** are fastened to the top plate **30** of the wall by any suitable means, such as by inserting nails **78** through nail holes **76**. Then, a truss **12** is positioned in the truss channel **52** of the hanger **26**. The truss hanger is fastened to the truss **12** by any suitable means, such as by inserting nails **56** through the nail holes **54** in each side panel **46** of the hanger **26**. The floor truss **12** is thereby secured to the hanger **26** and the wall **28**, and access to the wall cavity remains unhindered by sheathing. Subsequently, the sheathing **34** can be mounted on the wall **28** by moving the sheathing upward into place so that the extension flanges **60** of the hanger **26** extend through the slot **72** of the sheathing and the sheathing is positioned in the sheathing channels **68** between the back flanges **66** and the back panels **48**.

Referring to FIGS. **25-40**, a second embodiment of a truss hanger **126** for use in mounting the floor truss **12** to the wall **28** is illustrated. The truss hanger **126** is similar to the truss hanger **26** described above, with differences as pointed out herein. Where the truss hanger **26** is configured for mounting the floor truss **12** generally orthogonal to the wall **28**, the truss hanger **126** is configured for mounting the floor truss **12** in a skewed position relative to the wall.

Referring to FIGS. **26-33**, the truss hanger **126** includes a channel-shaped portion **138**, an extension portion **140**, and a connection portion **142**. The channel-shaped portion **138** is configured to receive the floor truss **12**. The channel-shaped portion **138** is configured to support the floor truss **12** at a non-orthogonal angle relative to the wall **28**. In this skewed embodiment, the channel-shaped portion **138** is offset from the extension portion **140**. The channel-shaped portion **138** includes a seat or base **144** and a pair of side panels **146** extending upward from the base. When installed, the base **144** is generally horizontal, and the side panels **146** extend generally vertical from the base. A back panel **148** extends from one of the side panels **146***a* toward the opposing side panel **146***b*. The back panel **148** is generally perpendicular to both the side panels **146** and the base **144**. When installed, the back panel **148** extends at a non-orthogonal angle (e.g., about 45°) to the interior face **50** of the fire retardant sheathing **34**. The base **144**, side panels **146**, and back panel **148** form a channel **152** configured to receive the floor truss **12**. Other configurations are within the scope of the present invention. For example, the truss hanger **126** can be configured to support the floor truss **12** at a range of different angles with respect to the wall **28**.

As seen in FIGS. **25** and **39**, the floor truss **12** is received in the channel **152** to attach the floor truss to the wall **28** at a skewed angle. The bottom chord **16** of the floor truss **12** engages and rests upon (i.e., is supported by) the base **144**. The end member **20** of the floor truss **12** is positioned against the back panel **148** between the side panels **146**. The truss hanger **126** includes fastening structure for attaching the floor truss **12** to the truss hanger. Fastening structure can be of any type known in the art for attaching a connector to a wooden structural member, such as nailing teeth (not shown) struck from the material of the hanger. In the illustrated embodiment, the fastening structure comprises a hole to allow for insertion of a fastening member. More specifically, in one embodiment the fastening structure comprises nail holes **154** in the side panels **146** of the truss hanger **126** (see,

FIG. **26**), and the fastening member comprises a nail **156** (see, FIG. **25**). In the illustrated embodiment, nail holes **154** are positioned on each of the side panels **146** so that nails **156** can be inserted into both the bottom chord **16** and the end member **20** of the floor truss **12** to attach the hanger **126** to the floor truss.

Referring again to FIGS. **26-33**, the extension portion **140** includes two extension flanges **160** configured to extend through the fire retardant sheathing **34**. One of the flanges **160***a* extends from the back panel **148**. The other flange **160***b* extends from the side panel **146***b*. The flanges **160** are positioned in opposed, face-to-face relation, and preferably engage each other along a juncture. At a bottom edge, each flange **160** includes a driving point **162**. Each of the driving points **162** is generally triangular and includes a pointed tip **164**. As seen in FIG. **28**, the tips **164** of the driving points **162** are vertically offset from each other. As illustrated, the tip **164***a* of one flange **160***a* extends vertically below the tip **164***b* of the other flange **160***b*. In one embodiment, the tips **164** are vertically offset from each other about ⅛", although other configurations are within the scope of the present invention, such as tips that are aligned or tips that are offset a smaller or larger amount.

A back flange **166** extends from the extension flange **160** generally perpendicular from the extension flange. Referring to FIG. **38**, the back flange **166** engages the wall **28** at a first location L_{10}, which in the illustrated embodiment is a vertical face of the top plate **30** of the wall behind the fire retardant sheathing **34**. The back flange **166** comprises a back flange portion **166***a* bent from the extension flange **160***a* and a back flange portion **166***b* bent from the extension flange **160***b*. The back panel **148**, side panel **146***b*, extension flanges **160**, and back flange **166** form a pair of sheathing channels **168** (see, FIG. **32**). Each sheathing channel **168** is configured to receive a portion of the fire retardant sheathing **34**.

As seen in FIGS. **34-36**, the extension flanges **160** extend through the slot **72** in the fire retardant sheathing **34**. Preferably, the slot has an area less than or equal to 6 square inches, and the gap between the extension flanges **60** and the edge of the slot **72** is less than or equal to ⅛". The driving points **162** extend down into the sheathing **34** to engage the sheathing and further secure the sheathing between the hanger **126** and the wall **28**. A portion of the fire retardant sheathing **34** extends into each sheathing channel **168** and is secured against the back flange **166**.

Referring again to FIGS. **26-33**, the connection portion **142** of the hanger **126** includes a pair of connector tabs **174** extending from the back flange portions **166***a*, **166***b*. Each connector tab **174** extends generally perpendicular from a respective one of the back flanges **166***a*, **166***b*. The connector tabs **174** are generally horizontal when the hanger **126** is installed. The connector tabs **174** are configured to overlie and engage an upper surface of the top plate **30** of the wall **28** at a second location L_{20} spaced from the first location L_{10} (see, FIGS. **37** and **38**). The connector tabs **174** can be used to attach the truss hanger **126** to the wall **28**, thereby hanging the floor trusses **12** from the wall. As seen in FIG. **25**, the connector tabs **174** extend over a portion of the top plate **30** of the wall **28**. Each connector tab **174** includes fastening structure, such as nail holes **176**, for insertion of a fastening member, such as nails **178** (see FIGS. **34** and **35**), to attach the hanger **126** to the wall **28**. In the illustrated embodiment, each connector tab **174** includes three nail holes **176**. Other configurations are within the scope of the present invention, such as a different number of nail holes, or alternate fastening structure such as nailing teeth or other appropriate structure for fastening the hanger to the wall.

The base **144** and back flanges **166** cooperate to stabilize the truss hanger **126** and protect the fire retardant sheathing **34** from exposure to the loads transferred from the truss **12** to the wall **28** by way of the truss hanger **126**. The channel **152** that receives an end portion of the truss **12** is spaced to the interior of the wall **28** and more particularly to the interior of the second location L_{20} where the connector tabs **174** are attached to an upper surface of the top plate **30** (see FIG. **38**). The vertically downward load of the truss **126** applied to the base **144** of the truss hanger **126** urges the truss hanger to pivot so that the base would move toward the wall **28**, which could damage the fire retardant sheathing **34** and pry out the nails **178** connecting the connector tabs **174** to the upper surface of the top plate **30**. However, this motion is resisted by the engagement of the back flanges **166** with the interior vertical face of the top plate **30** at the first location L_{10}. Thus, there is a force couple between the base **144** and back panel **148** of the hanger **126** (via engagement of the back flanges **166** with the top plate **30**) engaging the end fact of the truss. Accordingly, the truss hanger **126** and truss **12** are stable with minimal disruption of the fire retardant sheathing **34**, even though the truss is held at a distance from the wall **28**.

As seen in FIG. **40**, a truss hanger **126** as described above can be formed as one piece from a metal blank **180** that is stamped from a sheet metal roll and bent into shape. Parts of the blank **180** are labelled with reference numerals corresponding to the various parts of the formed truss hanger **126**. In one embodiment, the truss hanger **126** is stamped from 12-14 gauge steel, although other suitable materials are within the scope of the present invention. The configuration of the truss hanger **126** of the present invention allows a lighter gauge metal to be used.

The truss hanger **126** is used as described above with reference to the truss hanger **26**. In use, the truss hanger **126** is positioned in the slot **72** of the fire retardant sheathing **34** mounted to the wall **28**. One method of using the truss hanger **126** includes cutting the slot **72** in the fire retardant sheathing **34** (either before or after the sheathing is mounted on the wall). In one embodiment, the slot **72** can be cut using the slot template **82** (either before or after the sheathing **34** is mounted to the wall **28**). The slot **72** can be any suitable length, and in one embodiment is about 10 inches long. The truss hanger **126** is then positioned against the fire retardant sheathing **34** so that the extension flanges **160** extend through the slot **72**. In one embodiment, the hanger **126** is slid downward into place so that the extension flanges **160** extend through the slot **72**, the driving point **162** engages the fire retardant sheathing **34**, the back flange **166** is positioned adjacent the wall **28**, and the fire retardant sheathing is positioned in the sheathing channels **168** of the hanger. The hanger connector tabs **174** are fastened to the top plate **30** of the wall **28** by driving nails **178** through the nail holes **176** into the top plate **30**. Then, a truss member, e.g. truss bottom chord **16** is positioned in the truss channel **152** of the hanger **126**. Nails **156** are driven through holes **154** in the side panels **146** to secure the floor truss **12** to the wall **28**. The hanger **126** is thus secured to both the truss **12** and the wall **28**, with the fire retardant sheathing **34** between the hanger and the wall.

In another embodiment, the truss hangers **126** can be installed without pre-forming the slot **72** in the fire retardant sheathing **34**. More particularly, each hanger **126** can be driven into the sheathing **34**. The pointed tip **164** of the driving point **162** of the hanger **126** is positioned against a

top edge of the fire retardant sheathing **34**. The hanger **126** is then driven downward into the sheathing **34**, led by the pointed tip **164**. The hanger **126** continues to be driven into the gypsum boards until the connector tabs **174** engage the upper surface of the top plate **30**. In this way, the hanger **126** forms the slot in the sheathing **34**.

In another embodiment, the truss hangers **126** can be installed on the wall **28** before the sheathing **34** is mounted on the wall. This simplifies construction by allowing the building to be completely framed and roofed before requiring the sheathing **34** to be installed. Trade workers (e.g., mechanical, electrical) therefore have complete access to the wall cavity to install components without interference from the sheathing **34**. The truss hanger **126** is positioned against the wall **28** such that the back flange **166** engages the wall and the connector tabs **174** engage the top plate **30**. The connector tabs **174** are fastened to the top plate **30** of the wall by any suitable means, such as by inserting nails **178** through nail holes **176**. Then, a truss **12** is positioned in the truss channel **152** of the hanger **126**. The truss hanger **126** is fastened to the truss **12** by any suitable means, such as by inserting nails **156** through the nail holes **154** in each side panel **146** of the hanger. The floor truss **12** is thereby secured to the hanger **126** and the wall **28**, and access to the wall cavity remains unhindered by sheathing. Subsequently, the sheathing **34** can be mounted on the wall **28** by moving the sheathing upward into place so that the extension flanges **160** of the hanger **126** extend through the slot **72** of the sheathing and the sheathing is positioned in the sheathing channels **168** of the hanger.

The truss hanger **26**, **126** permits a floor truss **12** to be secured to a wall **28** through fire retardant sheathing **34** with minimal interruption to the sheathing. Installation of the truss hanger minimally disrupts the continuity of the sheathing and therefore does not reduce the fire resistive rating of a fire rated assembly. The extension flanges **60**, **160** extend through the fire retardant sheathing **34** so that the sheathing is interrupted only by the slot **72** required to receive the flanges. The back flanges **66**, **166** engage the wall **28** behind the sheathing **34** to stabilize the hanger **26**, **126** and protect the sheathing. The truss hanger **26**, **126** can be mounted on a wall already having sheathing mounted thereon, or can be mounted on a wall before the sheathing (i.e., the sheathing does not have to be mounted on the wall before the truss hanger), thereby simplifying construction. The truss hanger **26**, **126** can be formed from a metal blank **80**, **180**, which reduces the number of parts required to hang the floor truss **12** and simplifies the manufacturing process.

In an independent test performed by an outside firm, the truss hanger was installed as part of a wall assembly including 2×6 wood studs, 24" on center, with two layers of ⅝" Type X gypsum attached to each side. The gypsum board included a slot to accommodate the hanger. The hanger was fixed to the top plate of the wall with six 10d common nails in the connector tabs. The cavities in the wall were filled with mineral wool insulation. The testing was performed per ASTM E814 which subjected the specimen to the time/temperature curve prescribed in ASTM E119 for a period of two hours, followed by a hose stream test. As a result of this testing, the outside firm reported that when installed on one side of a maximum 2 hour fire-rated wall assembly, the penetration of the truss hanger through the gypsum board will not reduce the fire resistive rating of the 2 hour fire resistive assembly.

Having described the invention in detail, it will be apparent that modifications and variations are possible without departing from the scope of the invention defined in the appended claims.

When introducing elements of the present invention or the preferred embodiments(s) thereof, the articles "a", "an", "the" and "said" are intended to mean that there are one or more of the elements. The terms "comprising", "including" and "having" are intended to be inclusive and mean that there may be additional elements other than the listed elements.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above products without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A method of constructing a fire-resistive wall assembly, the method comprising:

mounting a fire wall hanger on a frame wall, the frame wall including a top plate and a plurality of studs extending down from the top plate, and the fire wall hanger including a channel-shaped portion sized and shaped to receive a structural component, a connection portion configured for attachment to the frame wall and an extension portion interconnecting the channel-shaped portion and the connection portion and spacing the channel-shaped portion from the connection portion, said step of mounting the fire wall hanger includes securing the connection portion of the fire wall hanger to the top plate of the frame wall so that the channel-shaped portion is spaced from the frame wall;

cutting an opening into an exterior edge of fire retardant sheathing, the opening extending through a front face of the fire retardant sheathing and through a rear face of the fire retardant sheathing and opening outwardly from the exterior edge of the fire retardant sheathing; and

after mounting the fire wall hanger on the frame wall and after cutting the opening into the exterior edge of the fire retardant sheathing, installing the fire retardant sheathing with respect to the frame wall so the rear face of the fire retardant sheathing faces toward the studs of the frame wall, said step of installing the fire retardant sheathing includes:

inserting the fire retardant sheathing between the channel-shaped portion of the fire wall hanger and the frame wall; and

moving the fire retardant sheathing relative to the fire wall hanger mounted on the frame wall so that an edge of the fire retardant sheathing bounding the opening moves alongside the extension portion and the fire wall hanger extends through the opening in the fire retardant sheathing.

2. The method of claim **1**, wherein said step of mounting the fire wall hanger includes engaging a front face of the frame wall with a back flange of the connection portion of the fire wall hanger.

3. The method of claim **2**, wherein the step of mounting the fire wall hanger further includes engaging an upper surface of the top plate with a top flange of the connection portion of the fire wall hanger.

4. The method of claim **3**, wherein said step of inserting the fire retardant sheathing between the channel-shaped portion of the fire wall hanger and the frame wall includes

positioning the fire retardant sheathing over and in front of a front face of the back flange of the connection portion of the fire wall hanger.

5. The method of claim **4**, wherein said step of installing the fire retardant sheathing includes placing the rear face of the fire retardant sheathing against the front face of the frame wall.

6. The method of claim **5**, wherein said step of placing the rear face of the fire retardant sheathing against the front face of the frame wall includes engaging the rear face of the fire retardant sheathing with the top plate and the plurality of studs, the top plate and the plurality of studs forming the front face of the frame wall.

7. The method of claim **3**, wherein said step of securing the connection portion of the fire wall hanger to the top plate of the frame wall includes driving one or more nails through the top flange of the connection portion of the fire wall hanger into the upper surface of the top plate.

8. The method of claim **1**, further comprising positioning the structural component on an upper surface of a base of the channel-shaped portion of the fire wall hanger before said step of installing the fire retardant sheathing, said step of positioning the structural component including engaging the structural component with a stop of the fire wall hanger to space an end of the structural component from the frame wall to permit the fire retardant sheathing to be received between the end of the structural component and the frame wall, and wherein said step of inserting the fire retardant sheathing between the channel-shaped portion of the fire wall hanger and the frame wall includes inserting the fire retardant sheathing between the end of the structural component and the frame wall.

9. The method of claim **1**, wherein said step of cutting the opening into the exterior edge of the fire retardant sheathing includes cutting the opening to have an area less than an area of an end of the structural component facing toward the fame wall, the area of the opening being taken at and parallel to the front face of the fire retardant sheathing.

10. The method of claim **9**, wherein said step of cutting the opening into the exterior edge of the fire retardant sheathing includes cutting the opening to have a height less than a height of the channel-shaped portion of the fire wall hanger.

11. The method of claim **10**, wherein said step of cutting the opening into the exterior edge of the fire retardant sheathing includes cutting the opening to have a width less than a width of the channel-shaped portion of the fire wall hanger.

12. The method of claim **1**, wherein said step of cutting the opening into the exterior edge of the fire retardant sheathing includes placing a template on the fire retardant sheathing and cutting the opening using the template.

13. The method of claim **1**, wherein said step of installing the fire retardant sheathing includes positioning the fire retardant sheathing relative to the fire wall hanger so that the edge of the fire retardant sheathing bounding the opening is in close conformance with a first exterior face of the extension portion of the fire wall hanger.

14. The method of claim **13**, wherein the edge of the fire retardant sheathing bounding the opening is a first vertical edge, wherein said step of installing the fire retardant sheathing relative to the fire wall hanger further includes positioning the fire retardant sheathing so that a second exterior face of the extension portion is in close conformance with a second vertical edge of the fire retardant sheathing bounding the opening.

15. The method of claim **1**, wherein said step of moving the fire retardant sheathing relative to the fire wall hanger includes positioning the fire retardant sheathing so that a first extension flange of the extension portion of the fire wall hanger extends through the opening in the fire retardant sheathing.

16. The method of claim **15**, wherein said step of moving the fire retardant sheathing relative to the fire wall hanger includes positioning the fire retardant sheathing so that a second extension flange of the extension portion of the fire wall hanger extends through the fire retardant sheathing.

17. The method of claim **16**, wherein said step of positioning the fire retardant sheathing so that the second extension flange of the fire wall hanger extends through the fire retardant sheathing includes positioning the fire retardant sheathing so that the second extension flange of the extension portion of the fire wall hanger extends through the opening in the fire retardant sheathing.

18. The method of claim **1**, wherein said step of moving the fire retardant sheathing relative to the fire wall hanger includes positioning the fire retardant sheathing relative to the extension portion of the fire wall hanger so that only the extension portion of the fire wall hanger extends through the fire retardant sheathing.

19. The method of claim **1**, wherein said step of moving the fire retardant sheathing relative to the fire wall hanger includes positioning the fire retardant sheathing relative to the extension portion of the fire wall hanger so that only first and second extension flanges of the extension portion of the fire wall hanger extend through the fire retardant sheathing.

20. The method of claim **1**, wherein said step of moving the fire retardant sheathing relative to the fire wall hanger includes positioning the fire retardant sheathing relative to the extension portion of the fire wall hanger so that only first and second planar extension plates of the extension portion of the fire wall hanger extend through the opening in the fire retardant sheathing.

21. The method of claim **20**, wherein only the first and second planar extension plates of the extension portion of the fire wall hanger are disposed in the opening in the fire retardant sheathing.

22. The method of claim **20**, wherein the first and second planar extension plates lie in parallel vertical planes.

23. The method of claim **22**, wherein the first and second planar extension plates each include opposite first and second ends, the first end of the first planar extension plate being connected to the channel-shaped portion by a first bend, the second end of the first planar extension plate being connected to the connection portion by a second bend, the first end of the second planar extension plate being connected to the channel-shaped portion by a third bend, and the second end of the second planar extension plate being connected to the connection portion by a fourth bend.

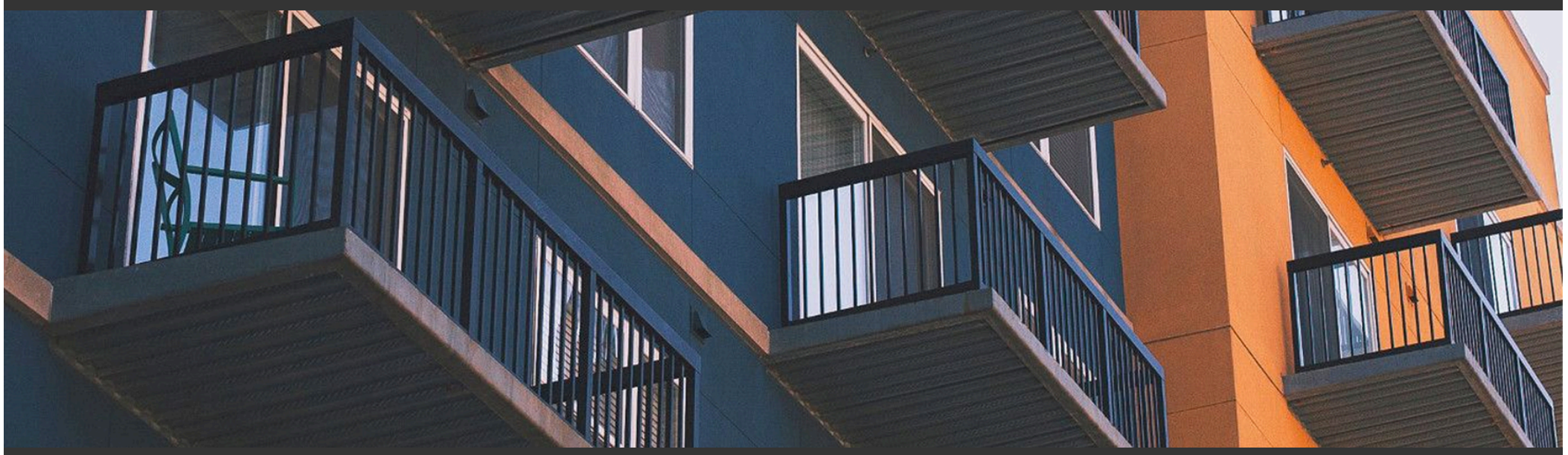
24. The method of claim **1**, wherein said step of installing the fire retardant sheathing comprises positioning first and second Type X gypsum panels of the fire retardant sheathing, the first and second Type X gypsum panels each being 5/8-inch-thick, the first Type X gypsum panel having a front face and an opposite rear face, the second Type X gypsum panel having a front face and an opposite rear face, the rear face of the first Type X gypsum panel forming the rear face of the fire retardant sheathing and the front face of the second Type X gypsum panel forming a front face of the fire retardant sheathing, the rear face of the second Type X panel being in contact with the front face of the first Type X gypsum panel.

Exhibit B

SIMPSON Strong-Tie

Search...

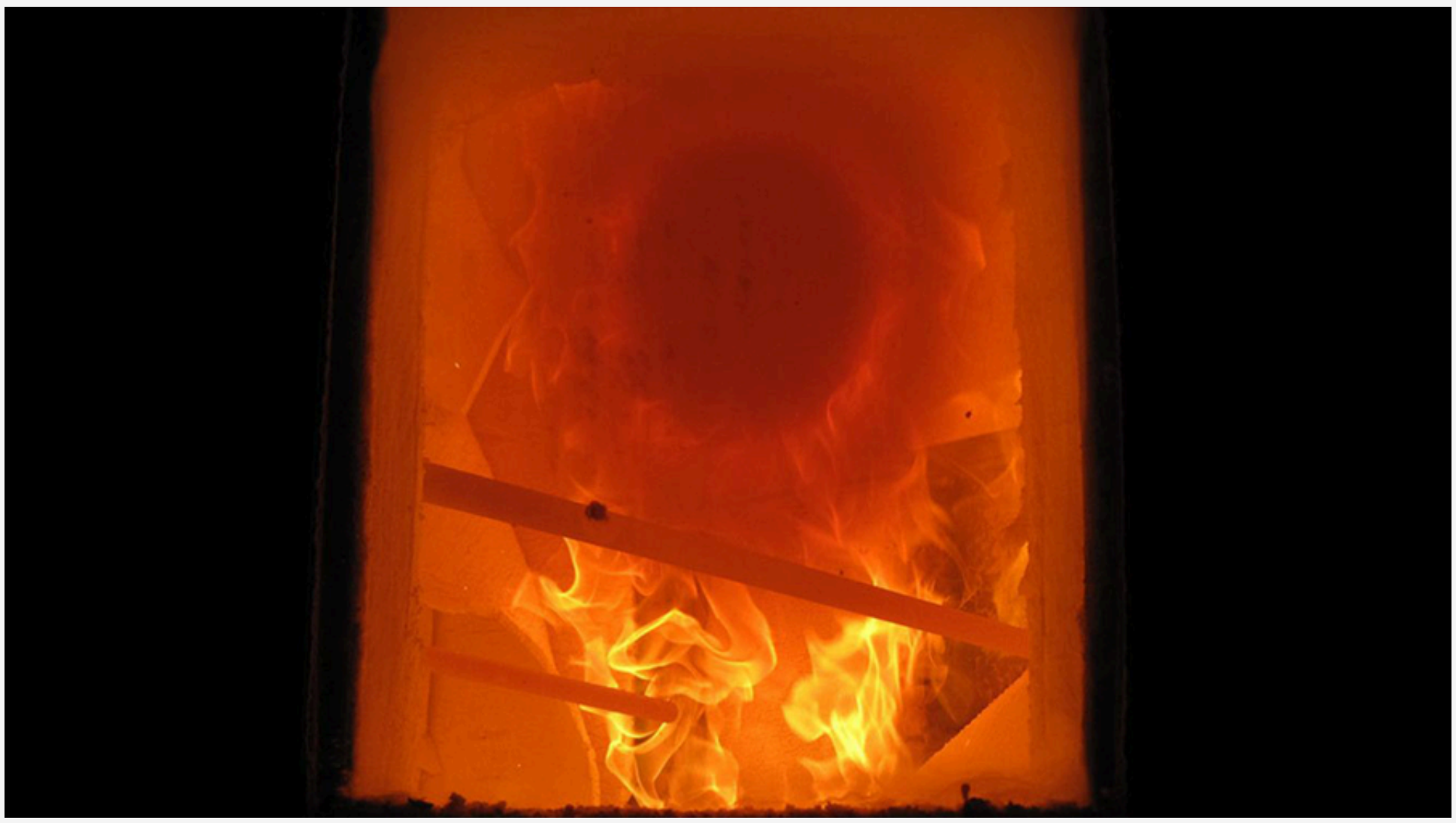
Fire Wall Assembly Solutions for Multi-Story Wood Buildings



Today, one of the fastest-growing segments of new residential construction is light-frame wood multi-story buildings. Several years ago, a key building code change provided an exception allowing wood-framed buildings to be classified as Type III construction. To meet the more stringent fire-resistant ratings for Type III construction, the exception in the building code requires wood members in load-bearing exterior walls to be treated with a fire-resistive chemical and to have a two-hour fire rating which commonly includes two layers of 5/8" gypsum wall board, or drywall.

Fire-Resistant Code Requirements for Modern Type III Wood Construction

Importantly, these hangers are code-listed under ICC-ES ESR-2553 and have been tested and rated at an accredited laboratory and received a two-hour rating for use on one or both sides of the wall. Rating that the hangers do not reduce the two-hour, fire wall assembly rating.



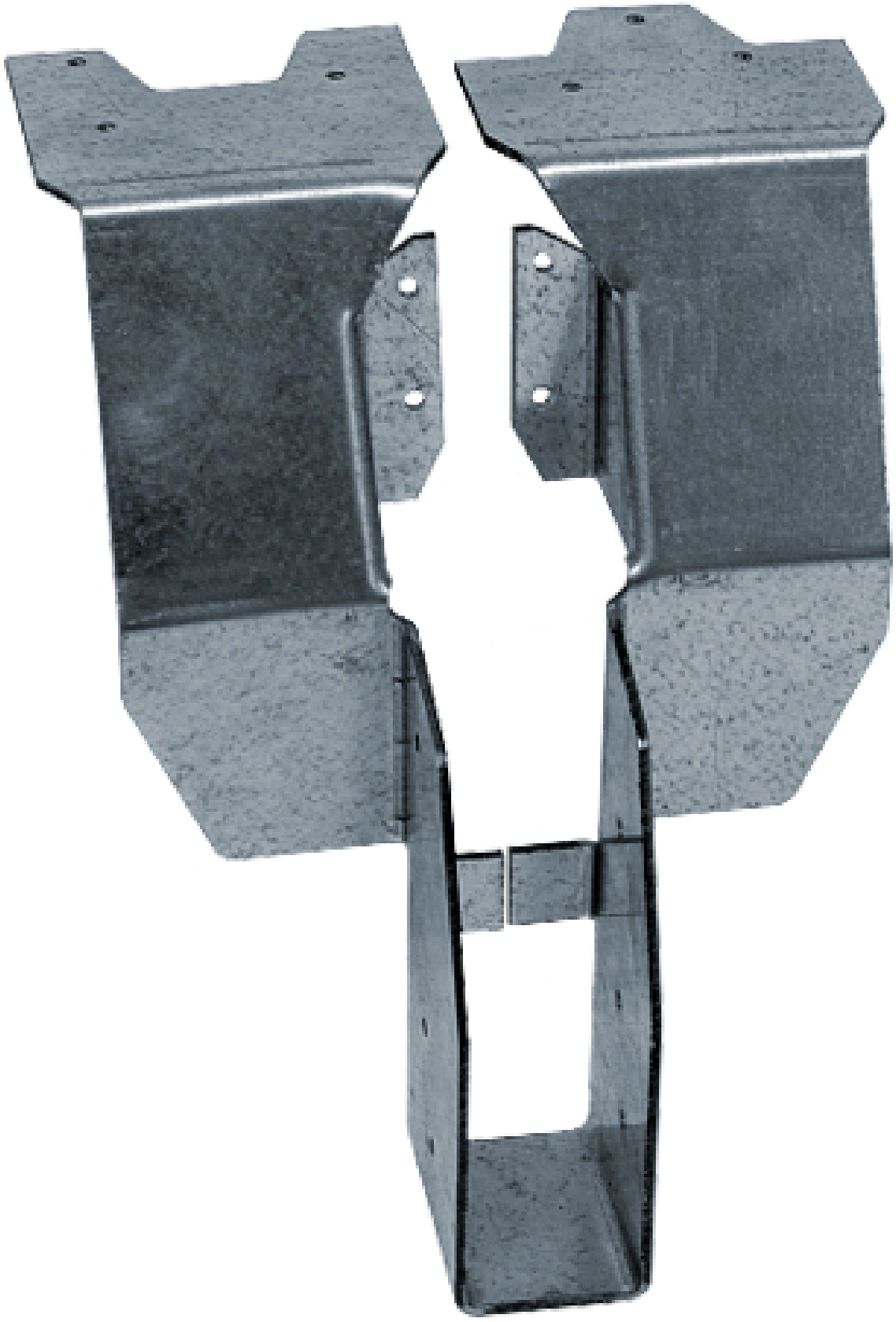
A fire wall assembly is tested at Intertek's laboratory in Middleton, WI.

on wood walls that are designated as two-hour fire walls in the IBC. The assembly of a 2x stud wall with two layers of drywall on both sides is exposed to fire for two hours in accordance with the ASTM E119 time vs. temperature curve. The assembly complies with the IBC requirements for through penetrations of fire-resistance-rated walls if it does not pass flame before the two-hour test is complete.

Full Range of Fire Wall Assembly Solutions

DGT™ / DGHT™ Hangers

The DGT/DGHT fire wall hanger series easily installs on a two-hour wood-stud fire wall (e.g., Type III construction) during framing. These patent-pending, top-flange hangers provide space for two layers of 5/8" gypsum wall board (drywall) to be slipped into place after the framing is complete. The DGT/DGHT fire-rated wall hangers have been tested according to ASTM E814 and received a two-hour fire rating for use on one or both sides of the wall. This rating verifies that the DGT/DGHT hangers do not reduce the two-hour, fire wall assembly rating. The rating applies to both 2×4 and 2×6 walls.



DGT Hangers →

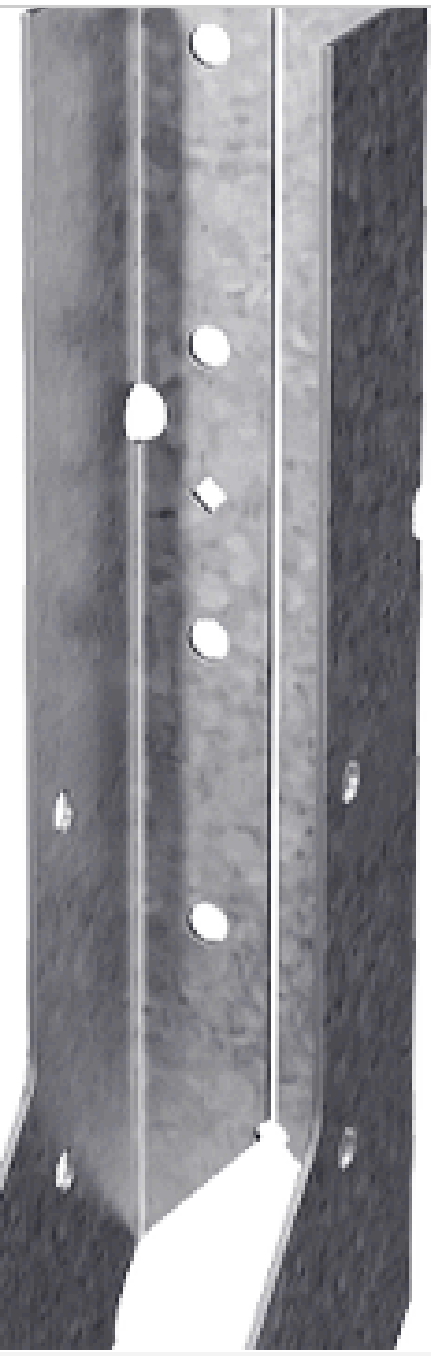
DHU Hangers - DHUTF Top-Mount Hangers

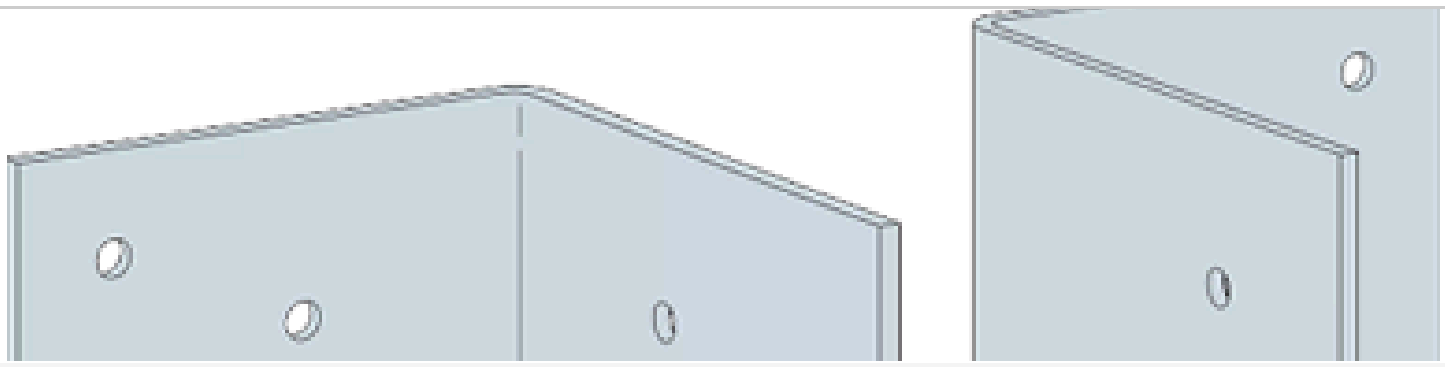
The DU/DHU face-mount and the DHUTF top-mount hangers are designed to carry joist floor loads to a wood-stud wall through two layers of 5/8" gypsum board (drywall). These hangers install after the drywall is in place. For widths at least 2 1/2" wide, they can be ordered with one flange concealed. They can also be ordered skewed up to 45°. These hangers have been tested according to ASTM E814 and received F (flame) and T (temperature) ratings for use on one or both sides of the wall. These ratings verify that the DU series hangers do not reduce the two-hour, fire wall assembly rating.

DHU Hangers

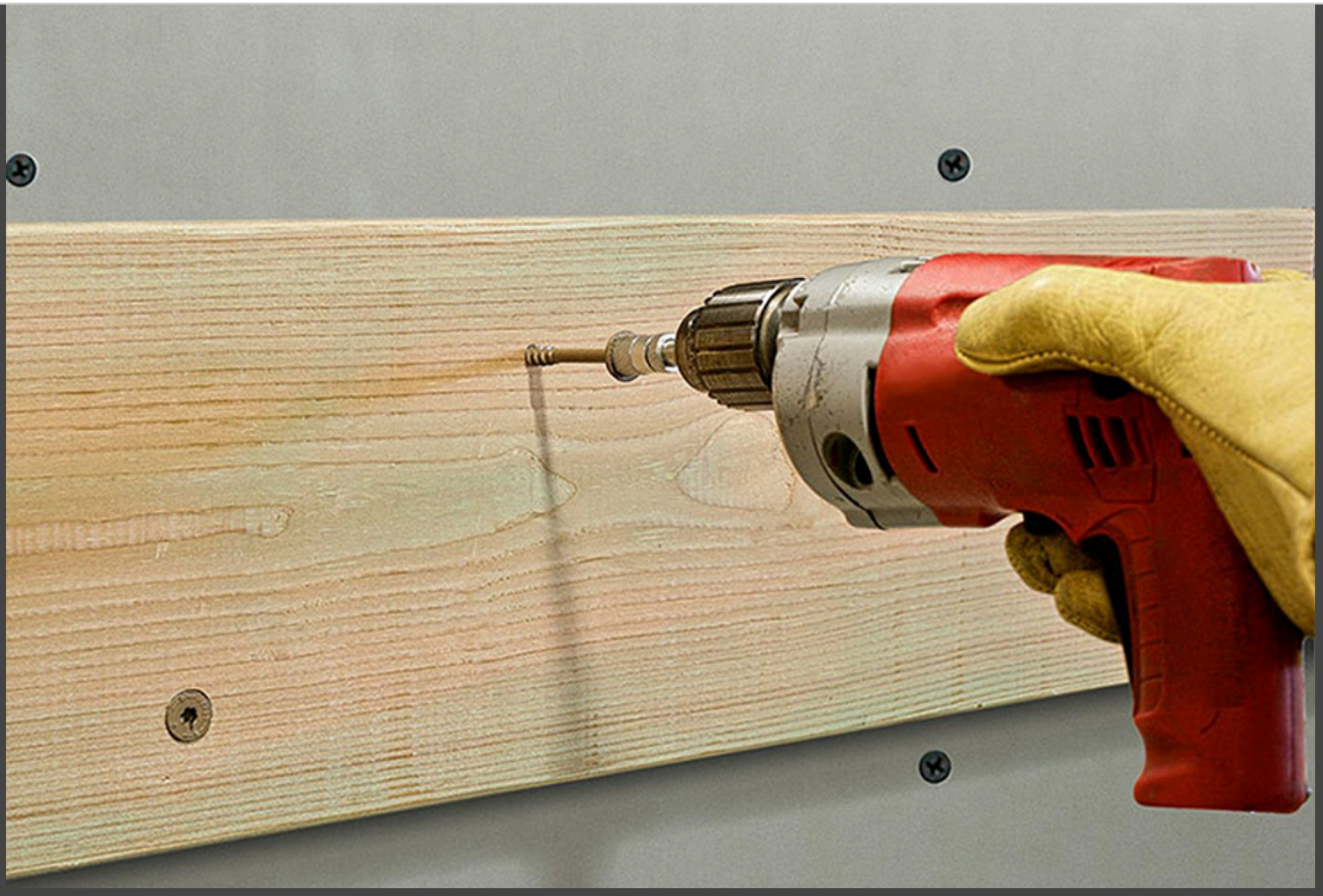
Additional Fire-Rated Hangers

In addition to the DGT and DGHT hangers, we offer several heavy-duty, face-mount hangers that have been tested according to ASTM E814 and received a two-hour fire rating. This rating verifies that these hangers do not reduce the two-hour fire wall assembly rating. These hangers can be installed over two layers of 5/8" drywall. For installation and allowable loads for these hangers, refer to engineering letter L-C-FACEMNTFW.





HHGU



Fastener Solution

Simpson Strong-Tie offers a third solution for installing drywall in Type III construction. The Strong-Drive® SDWS TIMBER screw may be installed with one or two layers of 5/8" gypsum board. This layer of gypsum can be located between the side and main member for a standard connection, and between the ledger and sheathing for a ledger connection. Loads are derived from assembly testing based on ICC-ES AC233.

SDWS TIMBER Screw

Strong-Drive® SDWS TIMBER Screw Fire Wall Solution

The Strong-Drive SDWS TIMBER screw may be installed with one or two layers of 5/8" gypsum board. This layer of gypsum can be located between the side and main member for a standard connection, and between the ledger and sheathing for a ledger connection. Loads are derived from assembly testing based on ICC-ES AC233.

Product Information

Technical Information

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Exhibit C

New Fire Wall Hangers Optimized for Power Nailers

A cost-effective, code-listed solution for multifamily.

Ideal for multifamily, multilevel Type III residential construction, our new patent-pending DGT™ and DGHT™ hangers are load-tested fire wall hangers with a two-hour fire rating. They're the first fire wall hangers designed to install with a power nailer during framing, which helps save time before hanging drywall and keeps construction projects on schedule.

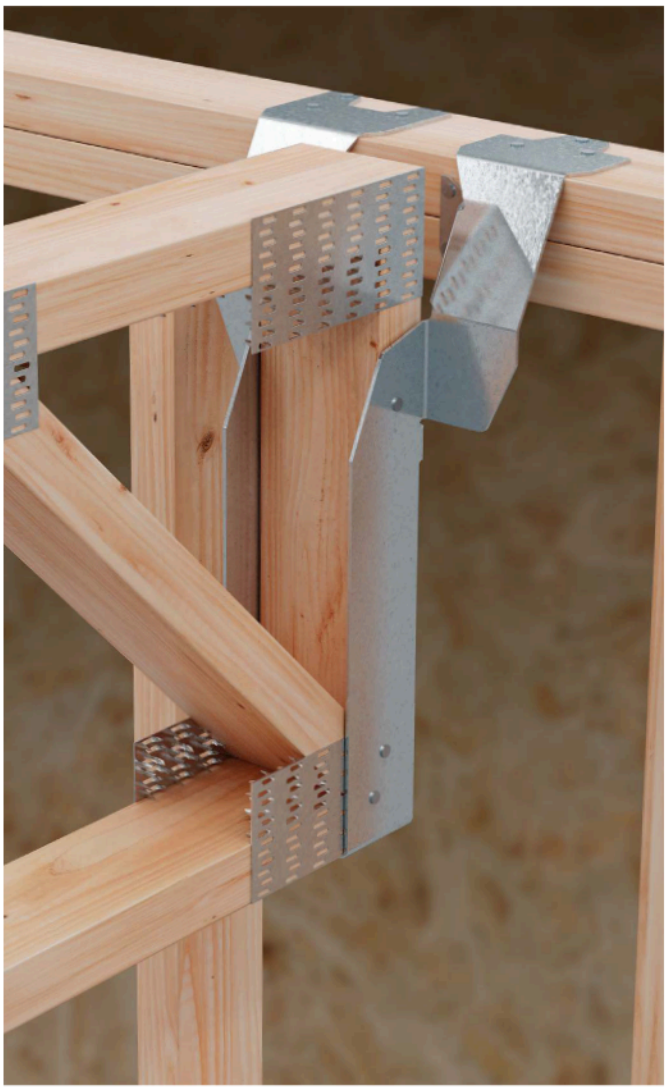
Both models are offered in a wide range of sizes, making them simple to select and use. Both the DGT and DGHT hangers provide space for two layers of ⅝" gypsum board (drywall) to be slipped into place after the framing is complete.

These fire wall hangers have been tested according to ASTM E814 and received a two-hour fire rating for use on one or both sides of the wall. This rating verifies that the DGT and DGHT hangers do not reduce the two-hour fire wall assembly rating.

These fire wall hangers are widely available and backed by our expert service and technical support.

Intertek ICC ES **Code listed under the IRC® and IBC®; see strongtie.com for code listing.**

DGT fire wall hanger installation.



DGHT fire wall hanger installation.

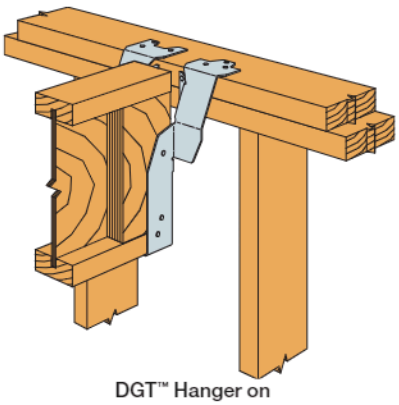
Features

- Tested loads for 1½" and 2½" power-driven or hand-installed nails
- Optimized, cost-effective design for the market
- Tested and code-listed for 2x4 walls
- Innovative top-flange design for back-to-back installation on 2x6 (min.) walls
- Space for two layers of ⅝" drywall after framing
- Two-hour Fire-Resistant rating Intertek Design No. SST/WPCF 120-01

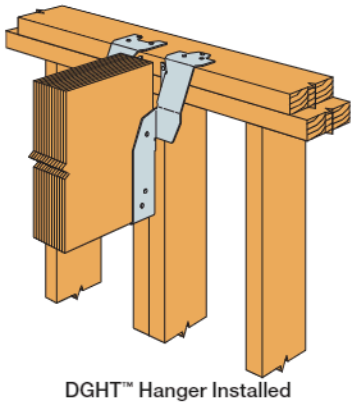
Material: DGT — 12 gauge; DGHT — 10 gauge

Finish: Galvanized

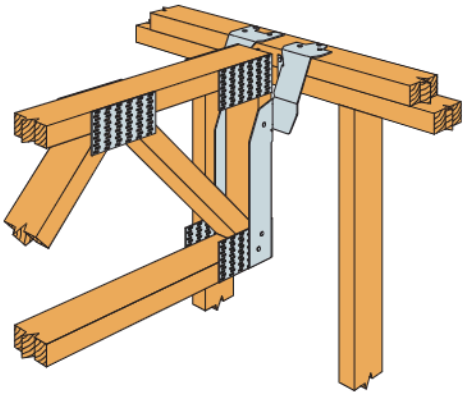
Fire-Rated and Ready for Multifamily



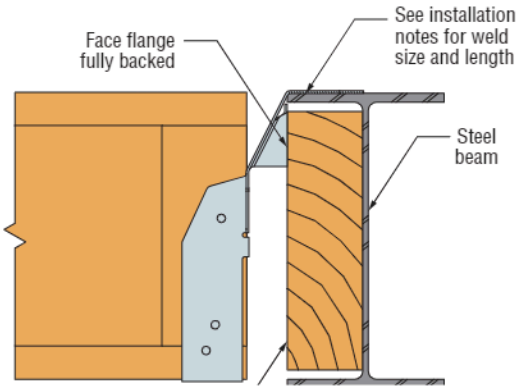
DGT™ Hanger on Stud Wall with I-Joist
(DGHT similar)



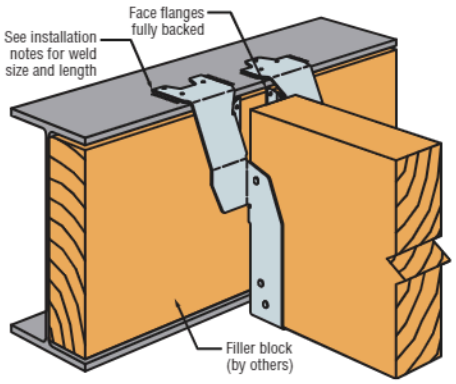
DGHT™ Hanger Installed over Double Studs



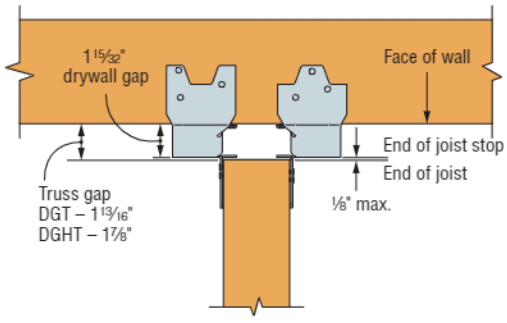
DGHT Hanger on Stud Wall with Truss
(DGT similar)



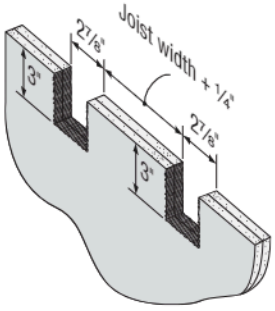
DGHT Welded with Full Backing – Side View



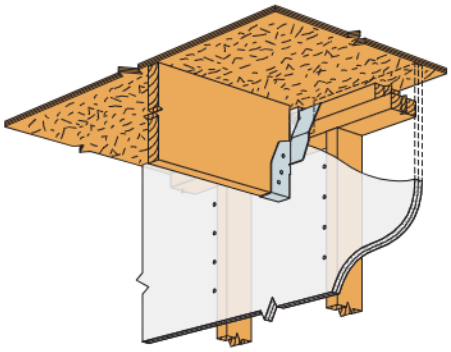
DGHT Welded Installation
(DGT similar)



DGHT Hanger Top View with Gap
(DGT similar)



Drywall Notches



DGT Hanger Installed
(DGHT similar)

Installation

- Use all specified fasteners. I-joists require web stiffeners.
- DGT/DGHT hangers are mounted like a standard top-flange hanger.
- Stud wall-plate splices must occur at a stud location.
- DGT welded to steel header with (4) 1/8" x 1½" fillet welds and (6) joist nails achieves a download of 1,700 lb. Face flanges require full backing.
- DGHT welded to steel header with (4) 3/16" x 1½" fillet welds and (6) joist nails achieves a download of 2,700 lb. Face flanges require full backing.

Options

- All DGHT models may be ordered with a skew angle of up to 45° or with one flange concealed left or right. To order, add an "X" to the model number (see illustration on p. 4).
- For the skew option, specify skew direction and angle (e.g., for a 3½" x 18" joist skewed 45° to the right, order as DGHT3.62/18X SKR45).
- For the concealed-flange option, simply specify left or right (e.g., DGHT3.62/18X right flange concealed). Concealed option available for widths from 3⅝"–7⅛".

For more information, go to **strongtie.com/firewallsolutions**.

Fire-Rated and Ready for Multifamily

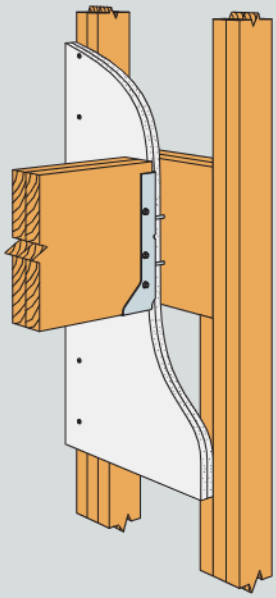
Allowable Loads on Stud Wall

Model	Ga.	Joist Depth (in.)	Fasteners (in.)			DF/SP				SPF/HF				Code Reference
			Top	Face	Joist	Uplift (160)	Download (100/125)			Uplift (160)	Download (100/125)			
							Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer		Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer	
DGT	12	7¼ to 11¼	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	500	1,650	1,650	1,650	450	1,270	1,270	1,270	IBC, FL, LA
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	640	1,860	—	1,860	555	1,430	—	1,430	
DGT	12	11⅞ to 24	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	500	1,620	1,620	1,620	450	1,370	1,370	1,370	
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	640	1,725	—	1,725	555	1,455	—	1,455	
DGHT	10	9½ to 24	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	660	1,995	1,995	1,995	570	1,535	1,535	1,535	
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,350	—	2,350	725	1,805	—	1,805	
DGHT (over studs)[4]	10	9½ to 24	(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,485	—	—	725	1,920	—	—	
DGHT (over studs with SDWC)[4]			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,740	—	—	725	2,065	—	—	

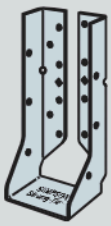
1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Allowable loads are for 2x4 minimum stud wall or nailer. Back-to-back installations require a minimum 2x6. Wall design by designer.
3. Hangers spaced closer than 16" o.c. shall reduce allowable load proportionately (e.g. for hangers spaced at 12" o.c., adjust tabulated loads by 12/16 = 0.75).
4. Where "(over studs)" is listed, DGHT installation requires a minimum (2) 2x4 stud or post in the wall at hanger location. Post design by designer. Where "(over studs with SDWC)" is listed, install SDWC15600 per the figure on p. 4.
5. DGHT hangers may be skewed up to 45°. Skew and concealed flange options cannot be combined. For skewed DGHT, apply 0.78 factor on hanger widths of 1⁹⁄₁₆"–3⅝" and 0.57 factor on widths of 3¹¹⁄₁₆"–7¼" for uplift and download. Square cut or bevel cut joist allowed. For DGHT one face flange concealed, use 0.74 of the table loads for uplift and download.
6. Web stiffeners required for I-joists.
7. DGT and DGHT may be installed over ⅝" maximum wood structural sheathing. For DGT, use 0.72 of the table loads for uplift and download. For DGHT, use 0.75 of table loads for uplift and download. Sheathing shall be installed flush with top of wall and fastened per code.
8. Fasteners: Nail dimensions are listed diameter by length. SDWC15600 = 0.152" shank diameter x 6" long Strong-Drive SDWC Truss Screw.

Additional Fire Rated Hangers for Mid-Wall Installations and Heavier Loads

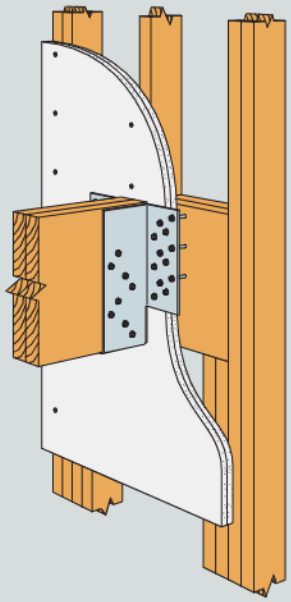
In addition to the DGT™ and DGHT™ hangers, we offer several heavy-duty, face-mount hangers that have been tested according to ASTM E814 and received a two-hour fire rating. This rating verifies that these hangers do not reduce the two-hour fire wall assembly rating. These hangers can be installed over two layers of ⅝" drywall. For installation and allowable loads for these hangers, refer to engineering letter L-C-FACEMNTFW on **strongtie.com**.



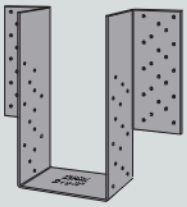
HUCQ Installed Over Two Layers of ⅝" Drywall



HUCQ



MGU Installed Over Two Layers of ⅝" Drywall



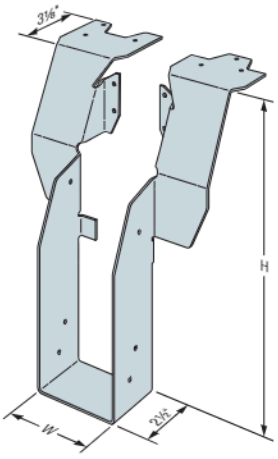
HHGU
(LGU, MGU and HGU similar)

Fire-Rated and Ready for Multifamily

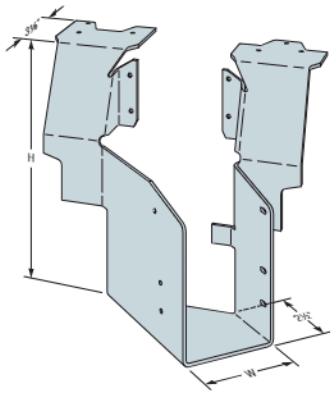
SIMPSON Strong-Tie

DGT™/DGHT™ Models

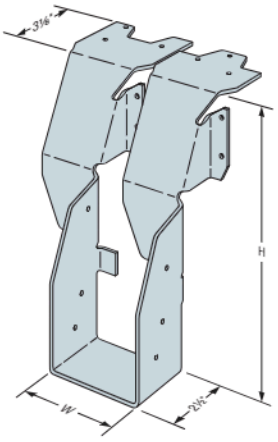
Joist Size (in.)	DGT (12 Ga.) Model No.	DGHT (10 Ga.) Model No.	W (in.)	H (in.)
2x8	DGT28	—	1 3/16	7 1/8
2x10	DGT210	—	1 3/16	9 1/8
2x12	DGT212	—	1 3/16	11 1/8
1 3/4 x 9 1/2	DGT1.81/9.5	DGHT1.81/9.5	1 13/16	9 7/16
1 3/4 x 11 7/8	DGT1.81/11.88	DGHT1.81/11.88	1 13/16	11 13/16
1 3/4 x 14	DGT1.81/14	DGHT1.81/14	1 13/16	13 15/16
1 3/4 x 16	DGT1.81/16	DGHT1.81/16	1 13/16	15 15/16
2 x 9 1/2	DGT2.1/9.5	DGHT2.1/9.5	2 1/8	9 7/16
2 x 11 7/8	DGT2.1/11.88	DGHT2.1/11.88	2 1/8	11 13/16
2 x 14	DGT2.1/14	DGHT2.1/14	2 1/8	13 15/16
2 x 16	DGT2.1/16	DGHT2.1/16	2 1/8	15 15/16
2 1/16 x 9 1/2	DGT2.1/9.5	DGHT2.1/9.5	2 1/8	9 7/16
2 1/16 x 11 7/8	DGT2.1/11.88	DGHT2.1/11.88	2 1/8	11 13/16
2 1/16 x 14	DGT2.1/14	DGHT2.1/14	2 1/8	13 15/16
2 1/16 x 16	DGT2.1/16	DGHT2.1/16	2 1/8	15 15/16
2 5/16 x 9 1/2	DGT2.37/9.5	DGHT2.37/9.5	2 3/8	9 7/16
2 5/16 x 11 7/8	DGT2.37/11.88	DGHT2.37/11.88	2 3/8	11 13/16
2 5/16 x 14	DGT2.37/14	DGHT2.37/14	2 3/8	13 15/16
2 5/16 x 16	DGT2.37/16	DGHT2.37/16	2 3/8	15 15/16
2 5/16 x 18	DGT2.37/18	DGHT2.37/18	2 3/8	17 15/16
2 5/16 x 20	DGT2.37/20	DGHT2.37/20	2 3/8	19 15/16
2 1/2 x 9 1/2	DGT2.56/9.5	DGHT2.56/9.5	2 9/16	9 7/16
2 1/2 x 11 7/8	DGT2.56/11.88	DGHT2.56/11.88	2 9/16	11 13/16
2 1/2 x 14	DGT2.56/14	DGHT2.56/14	2 9/16	13 15/16
2 1/2 x 16	DGT2.56/16	DGHT2.56/16	2 9/16	15 15/16
2 1/2 x 18	DGT2.56/18	DGHT2.56/18	2 9/16	17 15/16
2 1/2 x 20	DGT2.56/20	DGHT2.56/20	2 9/16	19 15/16
2 1/2 x 22	DGT2.56/22	DGHT2.56/22	2 9/16	21 15/16
2 1/2 x 24	DGT2.56/24	DGHT2.56/24	2 9/16	23 15/16
3 1/2 x 9 1/4	DGT3.62/9.25	DGHT3.62/9.25	3 5/8	9 3/16
3 1/2 x 9 1/2	DGT3.62/9.5	DGHT3.62/9.5	3 5/8	9 7/16
3 1/2 x 11 1/4	DGT3.62/11.25	DGHT3.62/11.25	3 5/8	11 3/16
3 1/2 x 11 7/8	DGT3.62/11.88	DGHT3.62/11.88	3 5/8	11 13/16
3 1/2 x 14	DGT3.62/14	DGHT3.62/14	3 5/8	13 15/16
3 1/2 x 16	DGT3.62/16	DGHT3.62/16	3 5/8	15 15/16
3 1/2 x 18	DGT3.62/18	DGHT3.62/18	3 5/8	17 15/16
3 1/2 x 20	DGT3.62/20	DGHT3.62/20	3 5/8	19 15/16
3 1/2 x 22	DGT3.62/22	DGHT3.62/22	3 5/8	21 15/16
3 1/2 x 24	DGT3.62/24	DGHT3.62/24	3 5/8	23 15/16
5 1/4 x 11 7/8	—	DGHT5.37/11.88	5 3/8	11 13/16
5 1/4 x 14	—	DGHT5.37/14	5 3/8	13 15/16
5 1/4 x 16	—	DGHT5.37/16	5 3/8	15 15/16
5 1/4 x 18	—	DGHT5.37/18	5 3/8	17 15/16
5 1/4 x 20	—	DGHT5.37/20	5 3/8	19 15/16
5 1/4 x 22	—	DGHT5.37/22	5 3/8	21 15/16
5 1/4 x 24	—	DGHT5.37/24	5 3/8	23 15/16
5 1/8 glulam	—	DGHT5.25	5 1/4	SPEC
5 1/2 glulam and 6x H = XX–XX	—	DGHT5.56	5 9/16	SPEC
6 3/4 glulam	—	DGHT6.88	6 7/8	SPEC
7 x 11 7/8	—	DGHT7.12/11.88	7 1/8	11 13/16
7 x 14	—	DGHT7.12/14	7 1/8	13 15/16
7 x 16	—	DGHT7.12/16	7 1/8	15 15/16
7 x 18	—	DGHT7.12/18	7 1/8	17 15/16
7 x 20	—	DGHT7.12/20	7 1/8	19 15/16
7 x 22	—	DGHT7.12/22	7 1/8	21 15/16
7 x 24	—	DGHT7.12/24	7 1/8	23 15/16



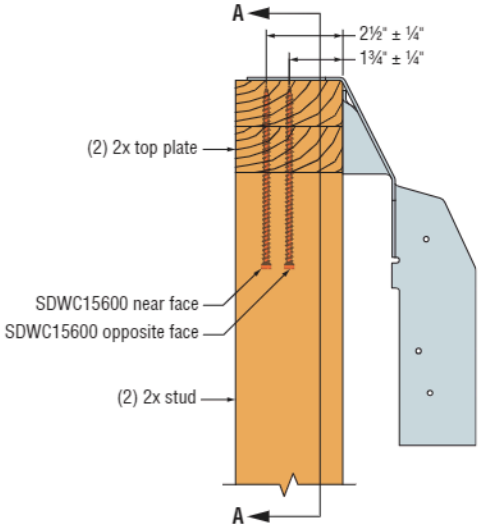
DGT Fire Wall Hanger
(DGHT similar)



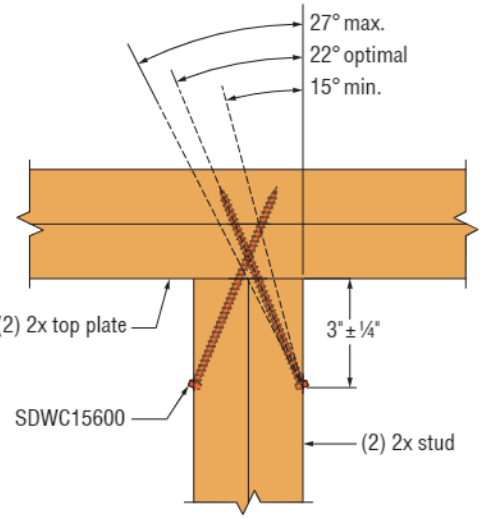
DGHT Skewed Right Shown
(Square-cut or bevel-cut joist allowed)



DGHT Installation with Right Flange Concealed
(Left similar)



DGHT (over studs with SDWC)



Section A-A Installation Angle Range
(DGHT not shown for clarity)

For more information about the DGT/DGHT hangers, see engineering letter L-C-DGFDGTSUB on **strongtie.com.**

(800) 999-5099
strongtie.com

Exhibit D

DGT™/DGHT™

Fire Wall Hangers

Ideal for multi-family, multi-level Type III residential construction, the new patent-pending DGT and DGHT hangers are load-tested firewall hangers with a two-hour fire rating. They're the first fire wall hangers designed to install with a power nailer during framing, which helps save time before hanging drywall and keeps construction projects on schedule.

These two top-flange hangers connect floor trusses and joists to wood stud walls. Both models are offered in a wide range of sizes, making them simple to select and use. Both the DGT and DGHT hangers feature space for two layers of ⅝" gypsum board (drywall) to be slipped into place after the framing is complete.

These fire wall hangers have been tested according to ASTM E814 and received a two-hour fire rating for use on one or both sides of the wall. This rating verifies that the DGT and DGHT hangers do not reduce the two-hour fire wall assembly rating.

Features:

- Tested loads for 1½" and 2½" power-driven or hand-installed nails.
- Optimized, cost-effective design for the market.
- Tested and code-listed for for 2x4 walls.
- Innovative top-flange design for back-to-back installation on 2x6 (min.) walls.
- Two-hour Fire-Resistant rating Intertek Design No. SST/WPCF 120-01.

Material: DGT — 12 gauge; DGHT — 10 gauge

Finish: Galvanized

Installation:

- Use all specified fasteners. I-joists require web stiffeners.
- DGT/DGHT hangers are mounted like a standard top-flange hanger.
- Stud wall-plate splices must occur at a stud location.
- DGT welded to steel header with (4) ⅛" x 1½" fillet welds and (6) joist nails achieves a download of 1,700 lb. Face flanges require full backing.
- DGHT welded to steel header with (4) 3⁄16" x 1½" fillet welds and (6) joist nails achieves a download of 2,700 lb. Face flanges require full backing.

Options:

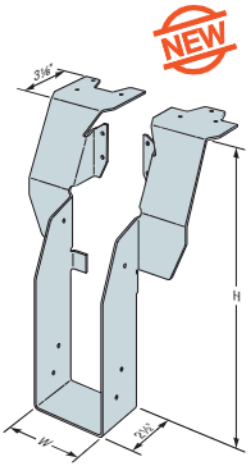
- All DGHT models may be ordered with a skew angle of up to 45° or with one flange concealed left or right. To order, add an "X" to the model number.
- For the skew option, specify skew direction and angle (e.g., for a 3½" x 18" joist skewed 45° to the right, order as DGHT3.62 /18X SKR45).
- For the concealed-flange option, simply specify left or right (e.g., DGHT3.62 /18X right flange concealed). Concealed option available for widths from 3⅝"–7⅛".

Codes: See p. 13 for Code Reference Key Chart

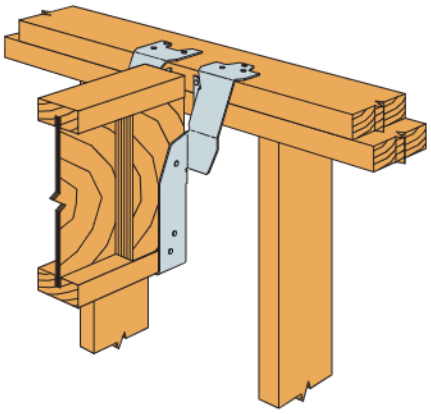
Web Applications: Visit **app.strongtie.com/hs** to access our Hanger Selector web application.

Two-Hour, Fire-Rated Wall

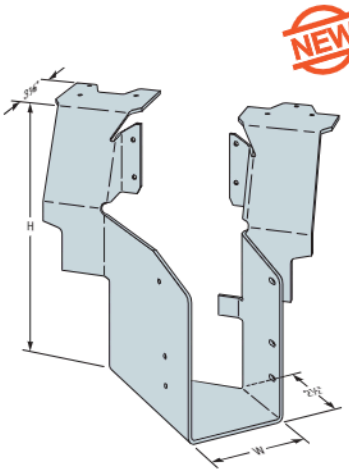
Simpson Strong-Tie has completed ASTM E814 standard testing at an accredited laboratory. The use of the DGT/DGHT hangers does not reduce the two-hour, fire wall assembly rating.



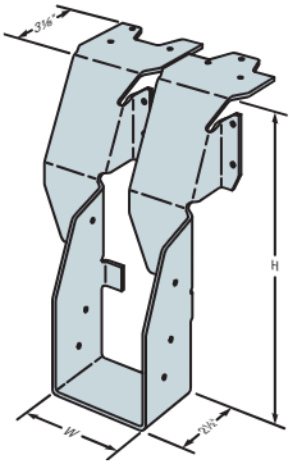
DGT
(DGHT similar)



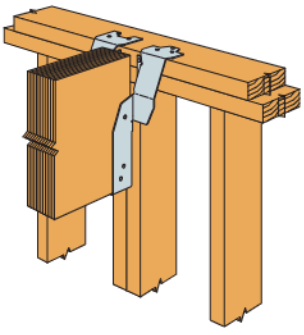
DGT Hanger Installed on Stud Wall with I-Joist
(DGHT similar)



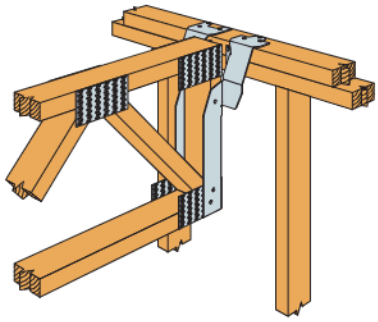
DGHT Skewed Right Shown
(square-cut or bevel-cut joist allowed)



DGHT Installation with Right Flange Concealed
(left similar)



DGHT Hanger Installed over Double Studs



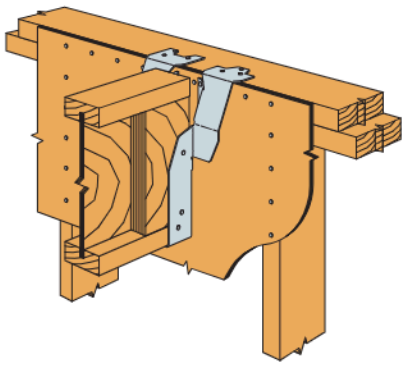
DGHT Hanger Installed on Stud Wall with Truss
(DGT similar)

Fire Wall Hangers (cont.)

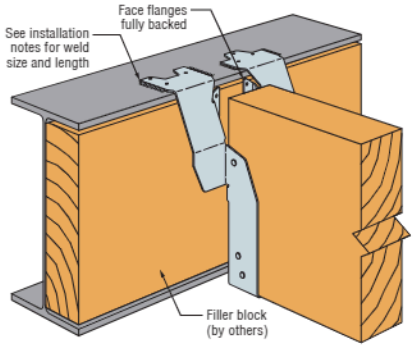
Allowable Loads on Stud Wall

Model	Ga.	Joist Depth (in.)	Fasteners (in.)			DF/SP				SPF/HF				Code Ref.
			Top	Face	Joist	Uplift (160)	Download (100/125)			Uplift (160)	Download (100/125)			
							Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer		Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer	
DGT	12	7¼ to 11¼	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	500	1,650	1,650	1,650	450	1,265	1,265	1,265	IBC®, FL, LA
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	640	1,860	—	1,860	555	1,430	—	1,430	
DGT	12	11⅞ to 24	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	500	1,620	1,620	1,620	450	1,380	1,380	1,380	
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	640	1,725	—	1,725	555	1,390	—	1,390	
DGHT	10	9½ to 24	(6) 0.148 x 1½	(2) 0.148 x 1½	(6) 0.148 x 1½	660	1,995	1,995	1,995	570	1,535	1,535	1,535	
			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,350	—	2,350	725	1,805	—	1,805	
DGHT (over studs)[4]	10	9½ to 24	(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,485	—	—	725	1,920	—	—	
DGHT (over studs with SDWC™)[4]			(6) 0.148 x 2½	(4) 0.148 x 2½	(6) 0.148 x 1½	830	2,740	—	—	725	2,065	—	—	

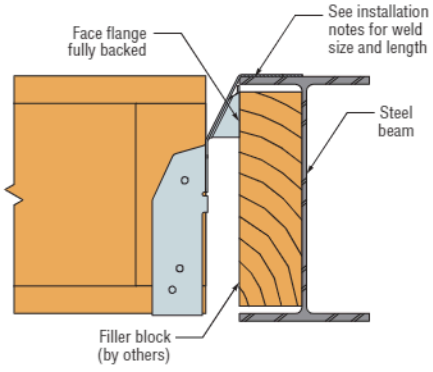
1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Allowable loads are for 2x4 minimum stud wall or nailer. Back-to-back installations require a minimum 2x6. Wall design by designer.
3. Hangers spaced closer than 16" o.c. shall reduce allowable load proportionately (e.g. for hangers spaced at 12" o.c., adjust tabulated loads by 12/16 = 0.75).
4. Where "(over studs)" is listed, DGHT installation requires a minimum (2) 2x4 stud or post in the wall at hanger location. Post design by designer. Where "(over studs with SDWC)" is listed, install SDWC15600 per the figure on p. 247.
5. DGHT hangers may be skewed up to 45°. Skew and concealed flange options cannot be combined. For skewed DGHT, apply 0.78 factor on hanger widths of 1⅜"–3⅝" and 0.57 factor on widths of 3 11/16"–7 ¼" for uplift and download. Square cut or bevel cut joist allowed. For DGHT one face flange concealed, use 0.74 of the table loads for uplift and download.
6. Web stiffeners required for I-joists.
7. DGT and DGHT may be installed over ⅝" maximum wood structural sheathing. For DGT, use 0.72 of the table loads for uplift and download. For DGHT, use 0.75 of table loads for uplift and download. Sheathing shall be installed flush with top of wall and fastened per code.
8. **Fasteners:** Nail dimensions are listed diameter by length. SDWC15600 = 0.152" shank diameter x 6" long Strong-Drive® SDWC Truss Screw. See pp. 23–24 for fastener information.



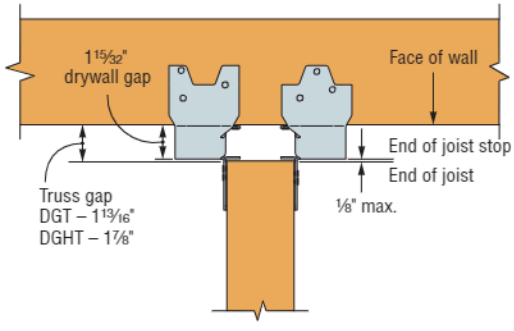
DGT Hanger Installation on Stud Wall with I-Joist
(DGHT similar)



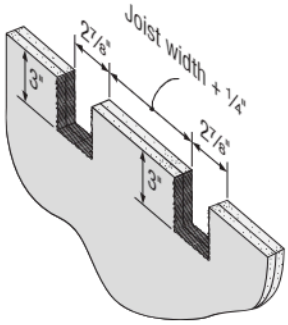
DGHT Welded Installation on Steel Beam



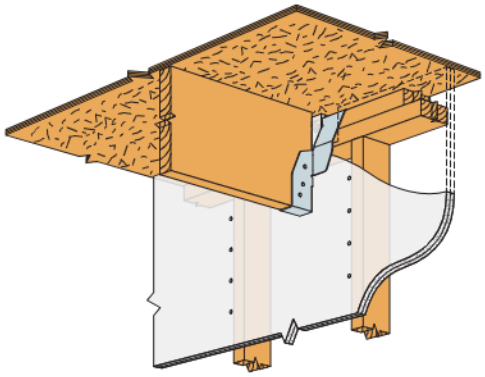
DGHT Welded Installation
(side view)



DGHT Hanger Installation
(top view with gap; DGT similar)



Drywall Notches

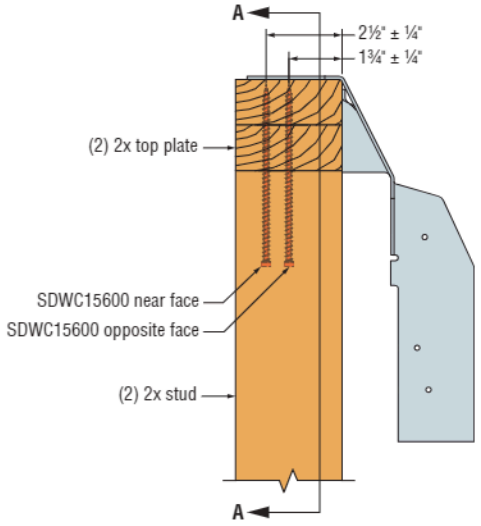


DGT Hanger Installation
(DGHT similar)

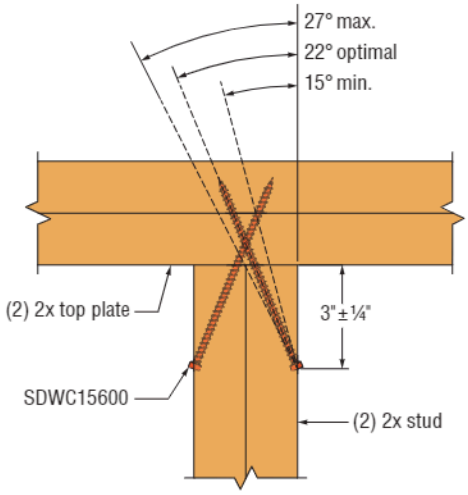
Fire Wall Hangers (cont.)

DGT/DGHT Models

Joist Size (in.)	DGT (12 Ga.) Model No.	DGHT (10 Ga.) Model No.	W (in.)	H (in.)
2x8	DGT28	—	1 9/16	7 1/8
2x10	DGT210	—	1 9/16	9 1/8
2x12	DGT212	—	1 9/16	11 1/8
1 3/4 x 9 1/2	DGT1.81/9.5	DGHT1.81/9.5	1 13/16	9 7/16
1 3/4 x 11 7/8	DGT1.81/11.88	DGHT1.81/11.88	1 13/16	11 13/16
1 3/4 x 14	DGT1.81/14	DGHT1.81/14	1 13/16	13 15/16
1 3/4 x 16	DGT1.81/16	DGHT1.81/16	1 13/16	15 15/16
2 x 9 1/2	DGT2.1/9.5	DGHT2.1/9.5	2 1/8	9 7/16
2 x 11 7/8	DGT2.1/11.88	DGHT2.1/11.88	2 1/8	11 13/16
2 x 14	DGT2.1/14	DGHT2.1/14	2 1/8	13 15/16
2 x 16	DGT2.1/16	DGHT2.1/16	2 1/8	15 15/16
2 1/16 x 9 1/2	DGT2.1/9.5	DGHT2.1/9.5	2 1/8	9 7/16
2 1/16 x 11 7/8	DGT2.1/11.88	DGHT2.1/11.88	2 1/8	11 13/16
2 1/16 x 14	DGT2.1/14	DGHT2.1/14	2 1/8	13 15/16
2 1/16 x 16	DGT2.1/16	DGHT2.1/16	2 1/8	15 15/16
2 5/16 x 9 1/2	DGT2.37/9.5	DGHT2.37/9.5	2 3/8	9 7/16
2 5/16 x 11 7/8	DGT2.37/11.88	DGHT2.37/11.88	2 3/8	11 13/16
2 5/16 x 14	DGT2.37/14	DGHT2.37/14	2 3/8	13 15/16
2 5/16 x 16	DGT2.37/16	DGHT2.37/16	2 3/8	15 15/16
2 5/16 x 18	DGT2.37/18	DGHT2.37/18	2 3/8	17 15/16
2 5/16 x 20	DGT2.37/20	DGHT2.37/20	2 3/8	19 15/16
2 1/2 x 9 1/2	DGT2.56/9.5	DGHT2.56/9.5	2 9/16	9 7/16
2 1/2 x 11 7/8	DGT2.56/11.88	DGHT2.56/11.88	2 9/16	11 13/16
2 1/2 x 14	DGT2.56/14	DGHT2.56/14	2 9/16	13 15/16
2 1/2 x 16	DGT2.56/16	DGHT2.56/16	2 9/16	15 15/16
2 1/2 x 18	DGT2.56/18	DGHT2.56/18	2 9/16	17 15/16
2 1/2 x 20	DGT2.56/20	DGHT2.56/20	2 9/16	19 15/16
2 1/2 x 22	DGT2.56/22	DGHT2.56/22	2 9/16	21 15/16
2 1/2 x 24	DGT2.56/24	DGHT2.56/24	2 9/16	23 15/16
3 1/2 x 9 1/4	DGT3.62/9.25	DGHT3.62/9.25	3 5/8	9 3/16
3 1/2 x 9 1/2	DGT3.62/9.5	DGHT3.62/9.5	3 5/8	9 7/16
3 1/2 x 11 1/4	DGT3.62/11.25	DGHT3.62/11.25	3 5/8	11 3/16
3 1/2 x 11 7/8	DGT3.62/11.88	DGHT3.62/11.88	3 5/8	11 13/16
3 1/2 x 14	DGT3.62/14	DGHT3.62/14	3 5/8	13 15/16
3 1/2 x 16	DGT3.62/16	DGHT3.62/16	3 5/8	15 15/16
3 1/2 x 18	DGT3.62/18	DGHT3.62/18	3 5/8	17 15/16
3 1/2 x 20	DGT3.62/20	DGHT3.62/20	3 5/8	19 15/16
3 1/2 x 22	DGT3.62/22	DGHT3.62/22	3 5/8	21 15/16
3 1/2 x 24	DGT3.62/24	DGHT3.62/24	3 5/8	23 15/16
5 1/4 x 11 7/8	—	DGHT5.37/11.88	5 3/8	11 13/16
5 1/4 x 14	—	DGHT5.37/14	5 3/8	13 15/16
5 1/4 x 16	—	DGHT5.37/16	5 3/8	15 15/16
5 1/4 x 18	—	DGHT5.37/18	5 3/8	17 15/16
5 1/4 x 20	—	DGHT5.37/20	5 3/8	19 15/16
5 1/4 x 22	—	DGHT5.37/22	5 3/8	21 15/16
5 1/4 x 24	—	DGHT5.37/24	5 3/8	23 15/16
5 1/8 glulam	—	DGHT5.25	5 1/4	SPEC
5 1/2 glulam and 6x H = XX–XX	—	DGHT5.56	5 9/16	SPEC
6 3/4 glulam	—	DGHT6.88	6 7/8	SPEC
7 x 11 7/8	—	DGHT7.12/11.88	7 1/8	11 13/16
7 x 14	—	DGHT7.12/14	7 1/8	13 15/16
7 x 16	—	DGHT7.12/16	7 1/8	15 15/16
7 x 18	—	DGHT7.12/18	7 1/8	17 15/16
7 x 20	—	DGHT7.12/20	7 1/8	19 15/16
7 x 22	—	DGHT7.12/22	7 1/8	21 15/16
7 x 24	—	DGHT7.12/24	7 1/8	23 15/16

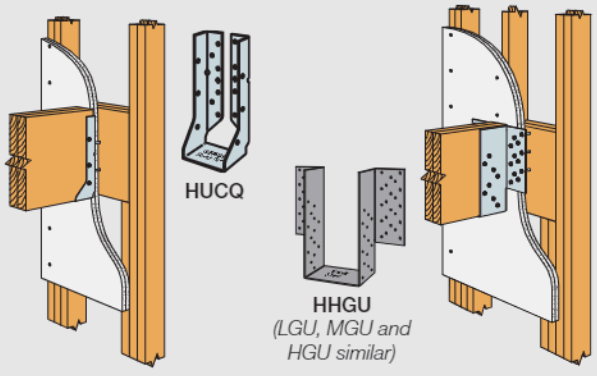


DGHT (over studs with SDWC™)



Section A-A Installation Angle Range
(DGHT not shown for clarity)

Additional Fire Rated Hangers for Mid-Wall Installations and Heavier Loads



HUCQ Installed Over Two Layers of ⅝" Drywall

MGU Installed Over Two Layers of ⅝" Drywall

For installation and allowable load information, see engineering letter L-C-FACEMNTFW at **strongtie.com**.

Exhibit E

SIMPSON Strong-Tie

strongtie.com

Simpson Strong-Tie Company, Inc. | 5956 West Las Positas Boulevard | Pleasanton, CA 94588 | (925) 560-9000

October 18, 2023

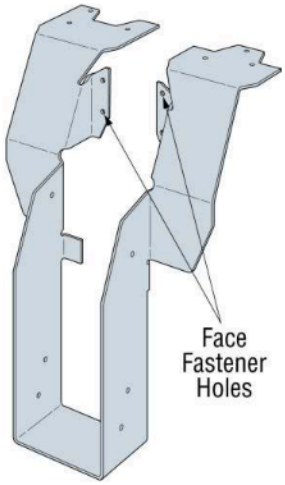
Re: Simpson Strong-Tie® DGT™ and DGHT™ Installed without Face Fasteners

To Whom It May Concern:

Simpson Strong-Tie has evaluated our DGT and DGHT hangers when installed without the fasteners into the face of the supporting wall or beam. Allowable loads for this installation are shown in the table below, with changes from the standard installations shown in red.

Model	Ga.	Joist Depth (in.)	Fasteners (in.)			DF/SP				SPF/HF			
			Top	Face	Joist	Uplift (160)	Download (100/125)			Uplift (160)	Download (100/125)		
							Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer		Stud Wall	2x, 3x Nailer	(2) 2x, 4x Nailer
DGT	12	7¼ to 11¼	(6) 0.148 x 1½	—	(6) 0.148 x 1½	195	1,650	1,650	1,650	170	1,270	1,270	1,270
			(6) 0.148 x 2½	—	(6) 0.148 x 1½	195	1,860	N/A	1,860	170	1,430	N/A	1,430
DGT	12	11⅞ to 24	(6) 0.148 x 1½	—	(6) 0.148 x 1½	195	1,620	1,620	1,620	170	1,370	1,370	1,370
			(6) 0.148 x 2½	—	(6) 0.148 x 1½	195	1,725	N/A	1,725	170	1,455	N/A	1,455
DGHT	10	9½ to 24	(6) 0.148 x 1½	—	(6) 0.148 x 1½	195	1,995	1,995	1,995	170	1,535	1,535	1,535
			(6) 0.148 x 2½	—	(6) 0.148 x 1½	195	2,350	N/A	2,350	170	1,805	N/A	1,805
DGHT (over studs)[4]	10	9½ to 24	(6) 0.148 x 2½	—	(6) 0.148 x 1½	195	2,350	N/A	N/A	170	1,805	N/A	N/A
DGHT (over studs with SDWC)[4]						195	2,350	N/A	N/A	170	1,805	N/A	N/A

1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Allowable loads are for 2x4 minimum stud wall or nailer. Back-to-back installations require a minimum 2x6. Wall design by designer.
3. Hangers spaced closer than 16" o.c. shall reduce allowable load proportionately (e.g. for hangers spaced at 12" o.c., adjust tabulated loads by $^{12}/_{16}$ = 0.75).
4. Where "(over studs)" is listed, DGHT installation requires a minimum (2) 2x4 stud or post in the wall at hanger location. Post design by designer. Where "(over studs with SDWC)" is listed, install SDWC15600.
5. Tabulated values are not applicable to skewed or concealed-flange options. Refer to strongtie.com for allowable loads and installation information for these hanger options, which require face fasteners.
6. Web stiffeners required for I-joists.
7. DGT and DGHT may be installed over $^{5}/_{8}$" maximum wood structural sheathing. For DGT, use 0.72 of the table loads for uplift and download. For DGHT, use 0.75 of table loads for uplift and download. Sheathing shall be installed flush with top of wall and fastened per code.
8. Fasteners: Nail dimensions are listed diameter by length. SDWC15600 = 0.152" shank diameter x 6" long Strong-Drive SDWC Truss Screw.



DGT Fire Wall Hanger
(DGHT similar)

The information in this letter is valid until **12/31/2024** when it will be re-evaluated by Simpson Strong-Tie. Please visit strongtie.com for additional pertinent information. If you have questions or need further assistance regarding this matter, please contact the Simpson Strong-Tie engineering department at 800.999.5099.

Sincerely,

SIMPSON STRONG-TIE COMPANY INC.

Exhibit F

DGF/DGBF/DGHF

Fire Wall Hangers

The DGF fire wall hanger is ideal for multi-family, multi-level building construction and easily installs on a two-hour wood stud fire wall (e.g., Type III construction) during framing. The new series features three models of top-flange hangers that connect floor trusses and joists to wood stud walls. The hangers feature enough space for two layers of ⅝" gypsum board (drywall) to be slipped into place after the framing is complete.

They have been tested according to ASTM E814 and received F (flame) and T (temperature) ratings for use on one or both sides of the wall. These ratings verify that the DGF/DGHF/DGBF hangers do not reduce the two-hour fire wall assembly rating.

Features:

- Fire-resistant F (flame) and T (temperature) rated in Intertek Design No. SST/WPCF 120-01.
- No need for additional restraint against rotation of the wall top plates.
- All models can be used on both sides of a 2x6 wall.

Material: DGBF — 7 gauge; DGF — 12 gauge; DGHF — 10 gauge

Finish: DGF — G90; DGHF and DGBF — gray paint

Installation:

- Use all specified fasteners.
- All models are mounted like a standard top-flange hanger.
- Stud wall-plate splices must occur at a stud location.
- I-joist require web stiffeners for full table loads. I-joist without web stiffeners have reduced loads shown in table.
- DGF welded to steel header with four 2" fillet welds and (6) joist nails achieves a download of 1,650 lb.
- DGHF and DGBF welded to steel header with two 2" fillet weld and (8) 0.148" x 1½" joist nails achieve a download of 3,000 lb.
- Weld size to match hanger thickness.
- Table uplift loads apply to welded applications.
- DGBF only — apply two ¼" beads of fire-resistant mortar caulk directly to top of wall plates for the first 6" on either side of top flange. See Intertek design listing for detail.
- DGBF only — locate double stud below hanger.
- Gap at the face of the hanger allows two layers of ⅝" gypsum board to be installed after the hanger is in place.

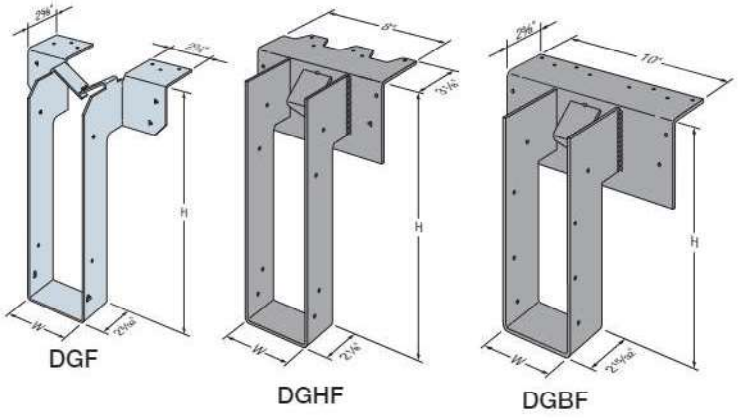
Options:

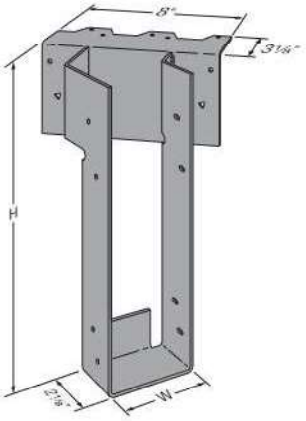
- All models of the DGHF hanger may be ordered with a skew angle of up to 45 degrees or with the top flange offset left or right. To order, add "X" to the model number.

Codes: See p. 11 for Code Reference Key Chart

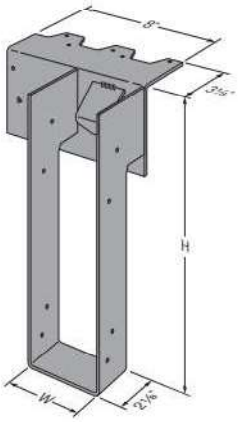
Two-Hour, Fire-Rated Wall

Simpson Strong-Tie has completed ASTM E814 standard testing at an accredited laboratory. The use of the DGF/DGBF/DGHF hangers does not reduce the two-hour, fire wall assembly rating. The hangers tested provide an F (flame) and T (temperature) rating.

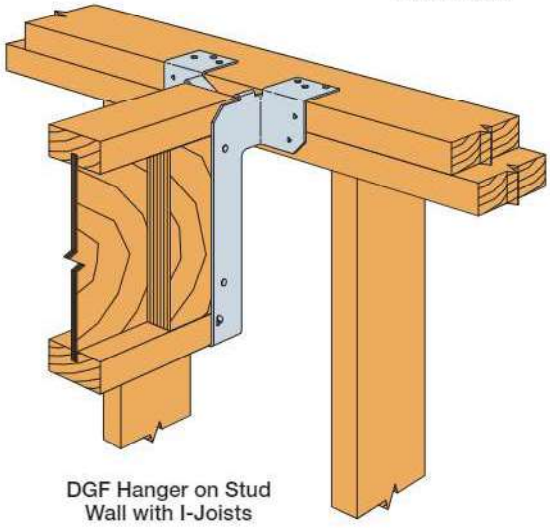




DGHF3.62/11.88
Skewed Right



DGHF
Top Flange
Offset Left



DGF Hanger on Stud
Wall with I-Joists

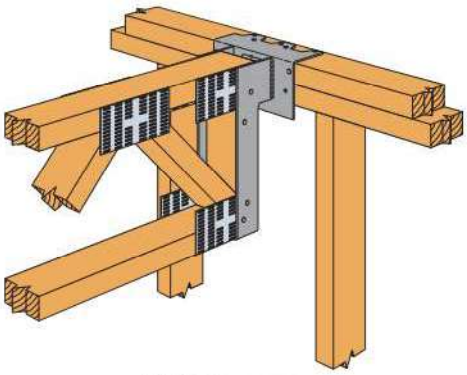
DGF/DGBF/DGHF

Fire Wall Hangers (cont.)

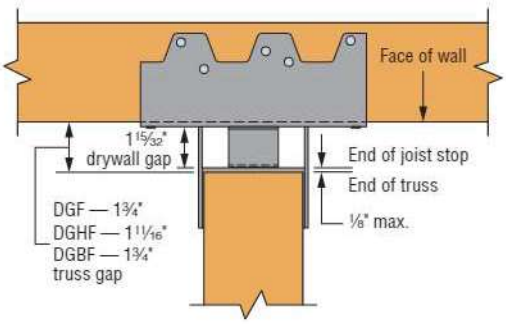
Allowable Loads on 2x4 or 2x6 Wall

Model	Ga.	Joist Depth (in.)	Fasteners (in.)			Web Stiff Req'd	DF/SP				SPF/HF				Code Ref.
							Uplift (160)	Download (100/125)			Uplift (160)	Download (100/125)			
			Top	Face	Joist			Studwall	2x, 3x Nailer	(2) 2x, 4x Nailer		Studwall	2x, 3x Nailer	(2) 2x, 4x Nailer	
DGF	12	7¼ to 11¼	(6) 0.148 x 3	(4) 0.148 x 3	(2) 0.148 x 1½	—	130	1,160	—	1,160	110	1,130	—	1,130	IBC, FL, LA
			(6) 0.148 x 1½	—	(6) 0.148 x 1½	✓	220	1,350	1,350	1,350	190	1,315	1,315	1,315	
			(6) 0.148 x 3	—	(6) 0.148 x 1½	✓	315	1,420	—	1,420	270	1,385	—	1,385	
DGF	12	11⅞ to 24	(6) 0.148 x 3	(4) 0.148 x 3	(2) 0.148 x 1½	—	130	1,160	—	1,160	110	1,130	—	1,130	
			(6) 0.148 x 1½	—	(6) 0.148 x 1½	✓	315	1,620	1,620	1,620	270	1,450	1,450	1,450	
			(6) 0.148 x 3	—	(6) 0.148 x 1½	✓	315	1,705	—	1,705	270	1,525	—	1,525	
DGHF	10	7¼ to 24	(5) 0.148 x 1½	(2) 0.148 x 3	(8) 0.148 x 1½	✓	855	2,030	2,030	2,030	650	1,855	1,855	1,855	
			(5) 0.148 x 3	(2) 0.148 x 3	(8) 0.148 x 1½	✓	900	2,135	—	2,135	770	1,950	—	1,950	
DGBF (over studs)	7	9½ to 24	(8) 0.148 x 3	(4) 0.148 x 3	(8) 0.148 x 3	✓	1,040	3,015	—	3,015	890	2,280	—	2,280	
DGHF (skewed)	10	7¼ to 24	(5) 0.148 x 3	(2) 0.148 x 3	(8) 0.148 x 1½	✓	315	1,620	—	1,620	270	1,350	—	1,350	—
DGHF (offset)	10	7¼ to 24	(5) 0.148 x 3	(2) 0.148 x 3	(8) 0.148 x 1½	✓	870	2,010	—	2,010	755	1,705	1,550	—	

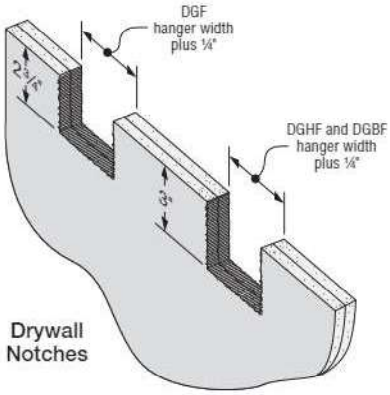
1. Uplift loads have been increased for earthquake or wind loading with no further increase allowed. Reduce where other loads govern.
2. Allowable loads are for 2x4 minimum stud wall or nailer. Back-to-back installations require a minimum 2x6. Wall design by designer.
3. For hangers spaced closer than 16" o.c., the allowable load shall be reduced proportionately.
4. DGBF installation requires a minimum (2) 2x4 stud or post in the wall at hanger location. Post design by designer.
5. DGHF hangers may be skewed up to 45. Skew and offset options cannot be combined.
6. Face nails for DGHF (offset) may be installed in any two holes.
7. DGF and DGHF may be installed over ⅝" maximum wood structural panel sheathing. For DGF, use 0.87 of the table loads for uplift and download. For DGHF, use 0.91 of table loads for uplift and full table downloads. Sheathing shall be installed flush with top of the wall and fastened per code.
8. **Fasteners:** Nail dimensions are listed diameter by length. See pp. 21–22 for fastener information.



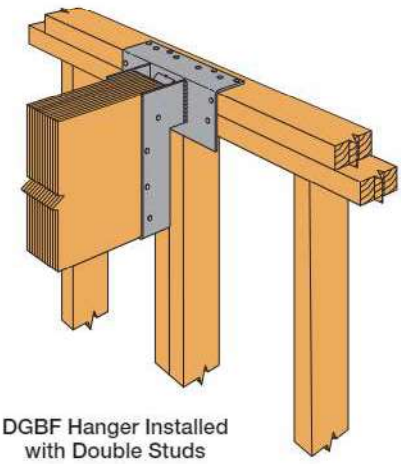
DGF Hanger on Stud Wall with Trusses



DGHF Hanger *(DGF similar)* Top View with Gap



Drywall Notches



DGBF Hanger Installed with Double Studs

DGF/DGBF/DGHF

Fire Wall Hangers (cont.)

Model Sizes

Joist Size (in.)	DGF Model	DGHF Model	DGBF Model	W (in.)	H (in.)
2x8	DGF28	—	—	1 9/16	7 1/8
2x10	DGF210	—	—	1 9/16	9 1/8
2x12	DGF212	—	—	1 9/16	11 1/8
1 3/4 x 9 1/2	DGF1.81/9.5	DGHF1.81/9.5	—	1 13/16	9 7/16
1 3/4 x 11 7/8	DGF1.81/11.88	DGHF1.81/11.88	—	1 13/16	11 13/16
1 3/4 x 14	DGF1.81/14	DGHF1.81/14	—	1 13/16	13 15/16
1 3/4 x 16	DGF1.81/16	DGHF1.81/16	—	1 13/16	15 15/16
2 x 9 1/2	DGF2.1/9.5	DGHF2.1/9.5	—	2 1/8	9 7/16
2 x 11 7/8	DGF2.1/11.88	DGHF2.1/11.88	—	2 1/8	11 13/16
2 x 14	DGF2.1/14	DGHF2.1/14	—	2 1/8	13 15/16
2 x 16	DGF2.1/16	DGHF2.1/16	—	2 1/8	15 15/16
2 1/16 x 9 1/2	DGF2.1/9.5	DGHF2.1/9.5	—	2 1/8	9 7/16
2 1/16 x 11 7/8	DGF2.1/11.88	DGHF2.1/11.88	—	2 1/8	11 13/16
2 1/16 x 14	DGF2.1/14	DGHF2.1/14	—	2 1/8	13 15/16
2 1/16 x 16	DGF2.1/16	DGHF2.1/16	—	2 1/8	15 15/16
2 5/16 x 9 1/2	DGF2.37/9.5	DGHF2.37/9.5	—	2 3/8	9 7/16
2 5/16 x 11 7/8	DGF2.37/11.88	DGHF2.37/11.88	—	2 3/8	11 13/16
2 5/16 x 14	DGF2.37/14	DGHF2.37/14	—	2 3/8	13 15/16
2 5/16 x 16	DGF2.37/16	DGHF2.37/16	—	2 3/8	15 15/16
2 5/16 x 18	DGF2.37/18	DGHF2.37/18	—	2 3/8	17 15/16
2 5/16 x 20	DGF2.37/20	DGHF2.37/20	—	2 3/8	19 15/16
2 1/2 x 9 1/2	DGF2.56/9.5	DGHF2.56/9.5	—	2 5/8	9 7/16
2 1/2 x 11 7/8	DGF2.56/11.88	DGHF2.56/11.88	—	2 5/8	11 13/16
2 1/2 x 14	DGF2.56/14	DGHF2.56/14	—	2 5/8	13 15/16
2 1/2 x 16	DGF2.56/16	DGHF2.56/16	—	2 5/8	15 15/16
2 1/2 x 18	DGF2.56/18	DGHF2.56/18	—	2 5/8	17 15/16
2 1/2 x 20	DGF2.56/20	DGHF2.56/20	—	2 5/8	19 15/16
2 1/2 x 22	DGF2.56/22	DGHF2.56/22	—	2 9/16	21 15/16
2 1/2 x 24	DGF2.56/24	DGHF2.56/24	—	2 9/16	23 15/16
3 1/2 x 9 1/4	DGF3.62/9.25	DGHF3.62/9.25	DGBF3.62/9.25	3 5/8	9 3/16
3 1/2 x 9 1/2	DGF3.62/9.5	DGHF3.62/9.5	DGBF3.62/9.5	3 5/8	9 7/16
3 1/2 x 11 1/4	DGF3.62/11.25	DGHF3.62/11.25	DGBF3.62/11.25	3 5/8	11 3/16
3 1/2 x 11 7/8	DGF3.62/11.88	DGHF3.62/11.88	DGBF3.62/11.88	3 5/8	11 13/16
3 1/2 x 14	DGF3.62/14	DGHF3.62/14	DGBF3.62/14	3 5/8	13 15/16
3 1/2 x 16	DGF3.62/16	DGHF3.62/16	DGBF3.62/16	3 5/8	15 15/16
3 1/2 x 18	DGF3.62/18	DGHF3.62/18	DGBF3.62/18	3 5/8	17 15/16
3 1/2 x 20	DGF3.62/20	DGHF3.62/20	DGBF3.62/20	3 5/8	19 15/16
3 1/2 x 22	DGF3.62/22	DGHF3.62/22	DGBF3.62/22	3 5/8	21 15/16
3 1/2 x 24	DGF3.62/24	DGHF3.62/24	DGBF3.62/24	3 5/8	23 15/16
5 1/4 x 11 7/8	—	—	DGBF5.37/11.88	5 3/8	11 13/16
5 1/4 x 14			DGBF5.37/15	5 3/8	11 15/16
5 1/4 x 16	—	—	DGBF5.37/16	5 3/8	15 15/16
5 1/4 x 18	—	—	DGBF5.37/18	5 3/8	17 15/16
5 1/4 x 20	—	—	DGBF5.37/20	5 3/8	19 15/16
5 1/4 x 22	—	—	DGBF5.37/22	5 3/8	21 15/16
5 1/4 x 24	—	—	DGBF5.37/24	5 3/8	23 15/16
5 1/8 glulam	—	—	DGBF5.25	5 1/4	SPEC
5 1/2 glulam and 6x	—	—	DGBF5.56	5 9/16	SPEC
6 3/4 glulam	—	—	DGBF6.88	6 7/8	SPEC
7 x 11 7/8	—	—	DGBF7.12/11.88	7 1/8	11 13/16
7 x 14	—	—	DGBF7.12/14	7 1/8	13 15/16
7 x 16	—	—	DGBF7.12/16	7 1/8	15 15/16
7 x 18	—	—	DGBF7.12/18	7 1/8	17 15/16
7 x 20	—	—	DGBF7.12/20	7 1/8	19 15/16
7 x 22	—	—	DGBF7.12/22	7 1/8	21 15/16
7 x 24	—	—	DGBF7.12/24	7 1/8	23 15/16

Exhibit G

ICC-ES NEWS RELEASE

For Immediate Release
Feb. 10, 2016
www.icc-es.org

For more information, contact:
Joram Suede
Tel: 1-800-423-6587 x3727
jsuede@icc-es.org

ICC-ES Issues ESR-3444 to MiTek for FWH Fire Wall Hangers

Report demonstrates proof of compliance to codes and standards

ICC Evaluation Service (ICC-ES), the experts in building product evaluation and certification, has issued ESR-3444 to MiTek USA for their FWH Fire Wall Hangers, providing evidence they comply with code requirements of the 2012, 2009 and 2006 International Building Codes® (IBC) and International Residential Codes® (IRC).

The FWH Top Mount Firewall Hanger is designed for attaching wood truss, wood I-joist, solid sawn lumber, or engineered wood lumber floor framing members to either minimum double 2-by 6 nominal wall top plates of wood frame walls or double 2-by solid sawn lumber headers, prior to installation of two layers of 5/8-inch-thick (15.9 mm) gypsum wallboard.

"We are pleased to issue another report to MiTek USA, a manufacturer of innovative building products who continue to rely on ICC-ES' technical expertise and high-quality reports, demonstrating proof of code compliance", said ICC-ES President Shahin Moinian, P.E." "ICC-ES reports provide code officials with technical information to instantly approve products for installation."

ICC-ES thoroughly examined MiTek USA's product information, test reports, calculations, quality control methods and other factors to ensure the product is code-compliant.

"MiTek USA is honored to receive this respected third-party validation of its new FWH Fire Wall Hanger," said Maged Diab, President for MiTek Builder Products - MiTek USA. "This ICC-ES evaluation report will provide added confidence for specifiers who are looking for a work-saving fire wall hanger solution."

About ICC-ES
A nonprofit, limited liability company, ICC-ES is the United States' leading evaluation service for innovative building materials, components and systems. ICC-ES Evaluation Reports (ESRs), Building Product Listings and PMG Listings provide evidence that products and systems meet requirements of codes and technical standards. The ICC-ES Environmental Programs issue VAR environmental reports that verify a product meets specific sustainability targets defined by today's codes, standards, green rating systems and ICC-ES environmental criteria. The Environmental Programs now offer Environmental Product Declarations (EPDs), to meet global market demand for science-based, transparent, quality-assured information about a product's environmental performance. ICC-ES is a member of the ICC Family of Companies. For more information, please visit www.icc-es.org.

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Exhibit H

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Attorneys for Defendant
SIMPSON STRONG-TIE COMPANY INC.

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

COLUMBIA INSURANCE CO. and MITEK INC.,

Plaintiffs,

v.

SIMPSON STRONG-TIE COMPANY INC.,

Defendant.

Case No. 3:19-CV-04683-TSH

DECLARATION OF SAM HENSEN IN SUPPORT OF OPPOSITION TO MOTION FOR PRELIMINARY INJUNCTION

Date: October 3, 2019
Time: 10:00 a.m.
Ctrm: A, 15th Floor
Judge: Magistrate Thomas S. Hixson

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I, SAM HENSEN, declare as follows:

1. I am a Vice President and General Manager of Connectors and Lateral Systems at Simpson Strong-Tie Company Inc., Defendant in the above-captioned case. I provide this Declaration in support of Simpson Strong-Tie Company Inc.'s ("Simpson") Opposition to Plaintiffs Columbia Insurance Co. and MiTek Inc.'s Motion for Preliminary Injunction. I have personal knowledge of the facts set forth herein, except as to matters stated on the basis of information and belief, and I believe such matters to be true. If called as a witness, I would testify as to the matters stated herein.

Factual Background Regarding Simpson

2. For more than 60 years, Simpson has focused on creating structural products that help people build safer and stronger homes and buildings. Simpson invests heavily in research and development, and since its founding has been dedicated to continuously expanding its line of structural connectors with innovative new products that address the changing needs of its customers. Simpson has also invested significant amounts obtaining code approval and code reports for its products.

3. Simpson's structural connectors are identified and described in its 340-page Wood Construction Connectors catalog. *See* <https://embed.widencdn.net/pdf/plus/ssttoolbox/jg8ztjcq8z/C-C-2019.pdf>. The catalog provides detailed information about each product, including load values, specifications, code approvals and other information used by structural engineers, specifiers, code-approval agencies, building departments, architects, designers and other consumers who purchase and use Simpson products.

4. Simpson was one of the first companies to introduce an extensive product line of structural connectors used in wood-to-wood and wood-to-concrete construction. From the beginning, Simpson made a substantial effort to connect with building designers in order to understand their needs and design products to meet their specific requirements for building design. As a result of Simpson's leading role and unparalleled reputation in the industry, building plans for a structure often call out Simpson's products by name and then require "Simpson or

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equivalent" in order to comply with building codes. Over time, other companies entered this market to compete with Simpson. Rather than dedicating significant investment to research and development, most of these companies attempted to copy or knock-off the Simpson products.

5. As a company that is built on innovation and intellectual property, Simpson is respectful of and highly values intellectual property rights, both its own rights and the rights of others. Simpson has obtained approximately 900 patents over the past 60 years. Simpson's patent portfolio covers a wide array of inventions related to construction products, including over 100 patents related to joist hangers.

Factual Background on MiTek and USP

6. According to MiTek's website, MiTek is a global supplier of software, engineered products, services, and automated manufacturing equipment. In 2011, Plaintiff MiTek Inc. ("MiTek") acquired USP Structural Connectors ("USP"), one of the companies in the market with Simpson.

Simpson Joist Hangers

7. A "joist hanger" or "hanger" is a type of structural connector, typically made of metal, that is used to secure the ends of joists, trusses, or other structural members to headers, walls, or other support members. Simpson has for many years been selling a diverse line of hangers to handle almost any application, including hangers with top flanges, face mount hangers, and skewed and sloped hangers. The following are just a few examples of the wide array of hangers currently marketed by Simpson:

 HUCQ Heavy-Duty Face-Mount Joist Hanger	 JB Joist, Beam and Purlin Top-Flange Hangers	 LSSR Slopeable/Skewable Rafter Hanger	 THAI Adjustable Hanger

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 WMU GFCMU Top-Flange Hanger	 WP High-Capacity Top-Flange Hangers	 ITS Engineered Wood Product Top-Flange Hangers	 BA Top-Flange Hangers or HUF

As noted above, Simpson obtained patents related to many of these hangers. *See*, *e.g.*, U.S. 3,601,428; 3,752,512; 4,005,942; D248,275; 4,230,416; 4,261,155.

Simpson DHU Hangers

8. Simpson has been working on the development of fire wall hangers or drywall hangers since at least as early as around 2013. Many of the buildings in which Simpson products are installed are subject to fire and safety codes. As merely one example, multi-family structures such as apartment buildings typically require partitions between units to have a fire-resistance rating of not less than two hours. One common way to achieve this rating is to mount fire-resistant sheathing, such as gypsum board (also known as "drywall"), along the walls. Particularly, two layers of 5/8 inch thick drywall are often used to achieve the required two-hour rating.

9. In 2013, building codes changed, allowing for wood structures to be built taller and more dense, leading to increased demand for hangers that would allow larger wood-framed structures to meet the new fire-resistance regulations. Hangers sold at the time could not be installed after drywall (because doing so would crush the drywall), so it was common to install the hangers before the drywall, which required cutting "notches" or "cutouts" around the hangers. However, these large cutouts exposed the wood framing and impaired the fire-resistance rating. To solve this problem, Simpson developed a new hanger that was installed over the typical two layers of 5/8 inch drywall without damaging the drywall.

10. In December 2013, Simpson introduced the DU/DHU/DHUTF Drywall Hangers (the "DHU Hangers"). Prior to Simpson's first public disclosure, Simpson filed a patent

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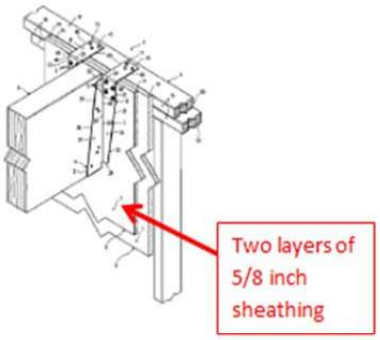
application covering the DHU Hangers on December 14, 2013. As shown on the cover page of U.S. Patent No. 9,394,680 ("Bundy"), the DHU Hangers are sized to permit two layers of 5/8 inch thick sheathing to be used for a fire-separation wall:



Bundy, Fig. 1

The fire-resistance rating of the DHU Hangers is superior to the rating achieved when drywall is notched around the entire joist and hanger, as described above.

Simpson DG Hangers

11. Although the DHU Hangers were successful in the market, some Simpson customers requested a firewall hanger that could be installed before the drywall, but which would achieve a fire-resistance rating that was closer to the DHU Hanger. Specifically, scheduling conflicts between framing contractors and drywall contractors arose, requiring drywall contractors to come out before the framing was complete so they could put the drywall in place and then come back later to finish the job once framing was complete. As a result, after the DHU Hangers were developed and released, Simpson worked on the design, development, and testing of the products that were released to the market as the DG/DGB/DGH Fire Wall Hangers (collectively, the "DG Hangers").

12. In designing the DG Hangers, Simpson combined the teachings of the Bundy Patent with its decades of experience designing joist hangers. The DG Hangers featured a simple (but, from an engineering perspective, elegant) design that resembles many of Simpson's successful prior art hangers (incorporating the same type of channel-shaped portion and top and back flange as many of its prior art hangers) and is quite different from MiTek's FWH Hanger. The DG Hangers also incorporated the spacing of the DHU Hangers (and the Bundy Patent), which allowed for the inclusion of two layers of 5/8" sheathing to create a fire-resistant barrier.

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13. When Simpson released the DG Hangers to the market in June of 2017, the products were successful. Simpson's design was less costly to make than MiTek's complicated design, allowing Simpson to charge a lower price, which, along with the ease of installation and Simpson's unparalleled reputation, led to increasing demand for the DG Hangers.

Plaintiffs' U.S. 10,024,049 Patent

14. Prior to Simpson's release of the DG Hangers, Simpson was aware of MiTek's FWH Hanger and the fact that Plaintiffs had filed a patent application covering the FWH Hanger. In developing the DG Hangers, Simpson was careful to design around Plaintiffs' then-pending patent application, U.S. Pat. Appl. 14/555,049 ("the '049 Application").

15. Plaintiffs have never asserted that any Simpson products infringe the '049 Patent.

Plaintiffs' U.S. 10,184,242 Patent

16. Simpson was unaware of the new claims added to the '409 Application until Plaintiffs sent Simpson's counsel a letter on December 19, 2018.

Development and Patenting of DGF Product Line

17. When Simpson became aware of the claims of the '409 Application that matured into the '242 Patent, Simpson designed around Plaintiffs' patent claims. On April 1, 2019 Simpson announced the DGF/DGHF/DGBF Fire Wall Hangers (collectively, the "Accused Products").

18. The Accused Products, like the DG Hangers illustrated above, feature a design that is very different than the MiTek FWH Hanger:

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Among other things, the Accused Products feature an innovative stop element that is nothing like the panel stops of the FWH Hanger. Simpson has filed a patent application covering the Accused Products. Plaintiffs have not asserted that the Accused Products infringe any claims of the '049 Patent or the '242 Patent.

Simpson's Opinion of Counsel

19. Within two weeks of first learning that the USPTO had allowed the '510 Patent, Simpson engaged a law firm specializing in patent law, Vierra Magen Marcus LLP (the "Vierra Law Firm"), to investigate the validity of the claims of the then-pending '517 Application. On June 3, 2019 (prior to the issue date of the '510 Patent), the Vierra Law Firm provided a written opinion (the "Vierra Opinion Letter") that all of the Asserted Claims are invalid due to prior art. A true and correct copy of the Vierra Opinion Letter is attached hereto as Exhibit A.

20. The Vierra Opinion Letter is 67-pages long and includes a detailed claim-by-claim explanation that each of the claims of the '517 Application is invalid.

21. After retaining the Vierra Law Firm to investigate the validity of Plaintiffs' patent claims, Simpson engaged another law firm (Sterne, Kessler, Goldstein & Fox P.L.L.C.) for purposes of challenging the validity of the '510 Patent claims through a USPTO Post Grant Review ("PGR") proceeding.

Response to Certain Allegations in Plaintiffs' Moving Papers

22. Many of Simpson's products are sold through distributors. Distributors can carry only Simpson products, only another manufacturer's products, or a combination of various manufacturers' products. Other companies producing products that are sometimes carried by distributors include MiTek, Advanced Connector Systems, and Tamlyn. In fact, some customers carry both Simpson and another manufacturer's products regularly to support home builders with exclusive hardware contracts.

23. Simpson and MiTek both manufacturer fire wall hangers, but they are not the only companies in the United States that do so. Other United States manufacturers of fire wall hangers include Advanced Connector Systems. Although customers purchase fire wall hangers produced by these manufacturers from distributors, they also purchase firewall hangers without going

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through a distributor. Further, I am not aware of any study, analysis, or survey that demonstrates that a customer that purchases any of Simpson's fire wall hanger products is more likely than that customer otherwise would be to purchase other Simpson products. Similarly, I am not aware of any study, analysis, or survey that shows that engineers specified MiTek's fire wall hangers more often in their plans once the MiTek fire wall hangers at issue in this lawsuit were introduced. I have never heard an engineer refer to MiTek as "an innovator" with respect to its fire wall hanger products or any other products.

I declare under penalty of perjury that the foregoing is true and correct and that this declaration was executed this 5th day of September, 2019, at Pleasanton, California.

/s/ Sam Hensen
SAM HENSEN

I hereby attest that I have on file all holographic signatures corresponding to any signatures indicated by a conformed signature (/s/) within this e-filed document.

/s/ Joseph V. Mauch
JOSEPH V. MAUCH

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Exhibit I

STINSON LEONARD STREET

Kurt James
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December 19, 2018

VIA E-MAIL AND CERTIFIED MAIL NO.
Mr. James P. Martin
Shartsis Friese LLP
One Maritime Plaza, 18th Floor
San Francisco, California 94111-3598
jmartin@sflaw.com

RE: U.S. Patent Application No. 15/675,409

Dear Mr. Martin:

Our firm represents Columbia Insurance Company and its related company Mitek Holdings, Inc. in intellectual property matters. Columbia Insurance Company is the owner of recently allowed U.S. Patent Application No. 15/675,409 (the '409 application). A copy of the published application, allowed claims and notice of allowance are enclosed for your reference. This application pertains to a hanger that extends through the fire retardant sheathing of a wall.

We obtained the enclosed copy of an advertisement for the DG/DGH/DGB Fire Wall Hangers sold by Simpson Strong-Tie Company Inc. (Simpson). These fire wall hangers fall within the scope of at least claims 21, 32 and 42 of the recently allowed '409 application.

You will appreciate that this important matter should be addressed as soon as possible. Our position is that Simpson should immediately arrange to stop selling and offering for sale these fire wall hangers and any others that infringe the attached claims. I invite you to call me or Joe Carr at MiTek to discuss the best way to proceed.

Please let us have some meaningful communication from you on this matter not later January 4, 2019.

Sincerely,

Kurt F. James

Kurt F. James

KFJ:SNL/dss
Enclosures

Exhibit J

STINSON LEONARD STREET

Kurt James
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May 28, 2019

Mr. James P. Martin
Shartsis Friese LLP
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RE: U.S. Patent Application No. 16/225,517 (Fire Wall Hanger)

Dear Mr. Martin:

As you know, our firm represents Columbia Insurance Company and its related company Mitek Holdings, Inc. in intellectual property matters. Columbia Insurance Company (Columbia) is the owner of recently allowed U.S. Patent Application No. 16/225,517, which will issue as U.S. Patent No. 10,316,510 on June 11, 2019. A copy of the published application and allowed claims are enclosed for your reference. This application pertains to a hanger that extends through the fire retardant sheathing of a wall.

We observed that Simpson Strong-Tie Company Inc. (Simpson) changed the design of its fire wall hangers following our recent settlement concerning Columbia's U.S. Patent No. 10,184,242, and now offers for sale the DGF, DBHF and DGBF Fire Wall Hangers on its website. These modified fire wall hangers still incorporate the gist of our client's invention, and fall within the scope of at least claims 1, 13 and 20 of the soon to issue U.S. Patent No. 10,316,510.

You will appreciate that this important matter should be addressed as soon as possible. Our position is that Simpson should immediately arrange to stop selling and offering for sale the DGF, DBHF and DGBF Fire Wall Hangers by June 11, 2019, as well as any others that infringe the attached claims. We can see no reason for any delay beyond the June 11 date. As before, I invite you to call me or Joe Carr at MiTek to discuss how best to settle this matter.

We are also advising you that corresponding Canadian patent 2,875,763 issued on May 14, 2019. A copy of the claims as granted is attached. The claims of this patent read on all of the models of Simpson fire wall hangers that we have brought to your attention in this and our prior communications.

Please let us have a substantive communication from you on this matter not later June 3, 2019.

Sincerely,

Kurt F. James

KFJ/dss
Enclosures