

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SIMPSON STRONG-TIE COMPANY INC.

Petitioner

v.

COLUMBIA INSURANCE COMPANY

Patent Owner

Case No. PGR2023-00049

U.S. Patent No. 11,649,626

**PETITION FOR POST-GRANT REVIEW
OF U.S. PATENT NO. 11,649,626**

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Patent Trial and Appeal Board
U.S. Patent & Trademark Office
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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 11,649,626 to Brekke et al. (“the ’626 patent”)
1002	Prosecution History of the ’626 patent
1003	Declaration of W. Andrew Fennell in Support of Petition for Post-Grant Review of U.S. Patent No. 11,649,626
1004	<i>Curriculum Vitae</i> of W. Andrew Fennell
1005	U.S. Publication No. 2002/0078656 to Leek et al. (“Leek”)
1006	U.S. Patent No. 10,024,049 to Brekke et al. (“Brekke’049”)
1007	U.S. Patent No. 9,394,680 to Bundy et al. (“Bundy”)
1008	U.S. Publication No. 2005/0155307 to Timony et al. (“Timony”)
1009	Japanese Application No. 19991014482 to Tsukamoto (“Tsukamoto”)
1010	U.S. Patent No. 4,261,155 to Gilb (“Gilb’155”)
1011	U.S. Patent No. 4,230,416 to Gilb (“Gilb’416”)
1012	U.S. Patent No. 4,827,684 to Allan (“Allan”)
1013	U.S. Publication No. 2014/0338282 to Sidhu (“Sidhu”)
1014	U.S. Patent No. 10,184,242 to Brekke et al. (“Brekke’242”)
1015	U.S. Publication No. 2001/0054270 to Rice (“Rice”)
1016	<i>Fire-Rated Assemblies in Commercial Construction</i> (“ <i>The Purple Book</i> ”), National Gypsum Properties, LLC (November 5, 2013)
1017	<i>GA-600-2012 Fire Resistance Design Manual, 20th Ed.</i> , Gypsum Association (June 2012).
1018	<i>2012 International Building Code</i> , International Code Council, June 2011 (“IBC-2012”)
1019	Prosecution History of Brekke’049

Exhibit No.	Description
1020	Prosecution History of the Brekke’242
1021	U.S. Patent No. 804,451 to Carlson
1022	U.S. Patent No. 3,601,428 to Gilb
1023	U.S. Patent No. 3,633,950 to Gilb
1024	U.S. Patent No. 3,752,512 to Gilb
1025	U.S. Patent No. 4,480,941 to Gilb
1026	U.S. Patent No. 4,717,279 to Commins
1027	U.S. Publication No. 2015/0184370 to Brekke (“Brekke’370”)
1028-1029	<i>Intentionally Left Blank</i>
1030	G. Waller and D.J. Cochrane, “Stainless Steel for Durability, Fire-resistance and Safety,” Nickel Development Institute, Technical Series 10042, Toronto, Ontario, Canada
1031	Patent Owner’s Infringement Claim Chart, <i>Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc.</i> , 3-19-cv-04683 (N.D. Cal.), filed August 12, 2019.
1032	U.S. Patent No. 4,005,942 to Gilb (“Gilb’942”)
1033	English-language Translation of Japanese Patent Application Publication No. H7-229225, with attached translator’s certification.
1034	Complaint for Patent Infringement, <i>Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc.</i> , 3-19-cv-04683 (N.D. Cal.), filed August 12, 2019.
1035	U.S. Patent No. 4,422,792 to Gilb (“Gilb’792”)
1036	U.S. Patent No. 10,316,510 to Brekke <i>et al.</i> (“the ’510 Patent”)
1037	Oxford Compact English Dictionary, Second Edition, Oxford University Press, (2000).
1038	U.S. Patent No. 11,021,867 to Brekke <i>et al.</i> (“the ’867 patent”)

Exhibit No.	Description
1039	GB Patent App. Pub. No. 2,451,853A (Cullen)
1040	EP Patent No. 0210744 B1 to Adams (Adams)
1041	Japanese Design Patent No. D1213894 to Yamaguchi (Yamaguchi) with attached certified English-language translation
1042	Complaint for Patent Infringement, Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc., 3-23-cv-02432 (N.D. Cal.), filed May 17, 2023.
1043	U.S. Patent No. 5,341,619 to Dunagan et al. (Dunagan)
1044	U.S. Patent No. 5,220,766 to Hills, Sr. (Hills)
1045	Simpson Strong-Tie, “Connector Update,” Vol. 2, No. 3 (November 1990)

I. INTRODUCTION

Simpson Strong-Tie Company Inc. (“Simpson” or “Petitioner”) respectfully requests post-grant review of claims 1, 9–15, 21, 29–38, 53, 61–67, 73, and 81–91 of U.S. Patent No. 11,649,626; issued on May 16, 2023, to Steven Brekke et al. (“the ’626 Patent”) (EX1001) in accordance with 35 U.S.C. §§321-329 and 37 C.F.R. §42.200 et seq.

The ’626 Patent is a continuation of U.S. Patent No. 11,021,867 (“the ’867 Patent”), which is a continuation of U.S. Patent No. 10,316,510 (“the ’510 Patent”). The Board held claims 1–12, 15–17, and 21–23 of the ’867 patent unpatentable under case heading PGR2021-00109, Paper 73 (P.T.A.B. Mar. 15, 2023), and claims 1–20 of the ’510 patent unpatentable under case heading PGR2019-00063, Paper 52 (P.T.A.B. Mar. 11, 2021). Similar to the defects found in the ’867 and ’510 Patents, the claims of the ’626 Patent fail to meet the statutory patentability requirements of 35 U.S.C. §-103(a), as demonstrated below and supported by the declaration of Mr. Fennell, who has over 25 years of experience in structural design and construction. *See* EX1003, ¶¶1–309. Therefore, Petitioner respectfully requests that the Board institute review and ultimately find all claims unpatentable.

II. IDENTIFICATION OF CHALLENGE (37 C.F.R. §42.204(B))

A. Citation of Prior Art

The '626 patent issued May 16, 2023, from U.S. Application No. 17/235,349 (the '349 application), filed April 20, 2021. EX1001, (21), (22). The '626 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, later issued as the '510 Patent; and U.S. Patent Application No. 16/433,799, later issued as the '867 patent. The following prior art documents applied in the grounds of unpatentability were published or filed prior to the earliest possible priority date, December 31, 2013, and constitute prior art under the noted statutes:

- Japanese Design Patent No. D1213894 to Yamaguchi, §102(a)(1) (issued August 9, 2004);
- U.S. Patent No. 9,394,680 to Bundy et al., §102(a)(2) (effectively filed December 14, 2013);
- U.S. Patent No. 4,230,416 to Gilb, §102(a)(1) (issued October 28, 1980);

- U.K. Patent App. Pub. No. 2451853A to Cullen et. al., §102(a)(1) (published February 18, 2009); and
- European Patent Pub. No. 0210744B1 to Adams, §102(a)(1) (published February 27, 1991).

B. Statutory Grounds for Challenge

Petitioner advances the following grounds of unpatentability. Claims 1 and 53 are the independent claims.

Ground	References	Basis	Claims Challenged
1	Yamaguchi, Bundy	§103	1, 9–14, 21, 29–30, 32–36, 38, 53, 61–66, 73, 81–82, 84–89, 91
2	Yamaguchi, Bundy, Gilb’416	§103	15, 31, 37, 67, 83, 90
3	Cullen, Bundy	§103	1, 9–15, 21, 29–38, 53, 61–67, 73, 81–91
4	Adams, Bundy	§103	1, 9–14, 21, 29–30, 32–36, 38, 53, 61–66, 73, 81–82, 84–89, 91
5	Adams, Bundy, Gilb’416	§103	15, 31, 37, 67, 83 and 90

III. BACKGROUND OF THE ’626 PATENT

A. Overview of the Claimed Invention

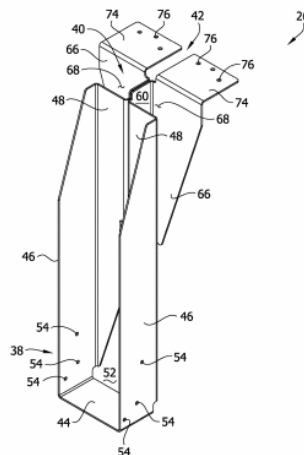
Despite the well-known characteristics of joist hangers common prior to December 31, 2013, Patent Owner claims to have invented a hanger for connecting

a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon. EX1001, 12:14–36, 18:16–38.

The '626 Patent discloses a hanger having three primary components: (1) a channel-shaped portion 38 to receive the structural component, (2) a connection portion 42 to attach against a wall frame, and (3) an extension portion 40 to space channel-shaped portion 38 from connection portion 42. EX1001, 4:34-47, 5:1-41, FIGS. 1-2. Channel-shaped portion 38 includes a base 44 and a pair of side panels 46 extending upward from base 44 to form a channel 52. EX1001, 4:37-47.

Connection portion 42 includes two back flanges 66 for engaging a vertical face of a top plate and two connector tabs 74 extending perpendicularly from back flanges 66 to engage an upper surface of the top plate. EX1001, 6:37–53. Extension portion 40 includes two extension flanges 60 extending from back panels 48 to back flange 66. EX1001, 5:1-25; EX1003, ¶¶48–50.

FIG. 2



EX1001, FIG. 2.

While the claimed hanger is described as useful for connecting a structural element to a frame wall adapted to have drywall mounted thereon, a person of ordinary skill in the art (POSITA) would have understood, in view of the specification and prosecution history, that the claims do not restrict the use of the hanger to a wood-frame construction only. EX1001, 4:18-29; EX1002, 347, 353. Indeed, the '626 Patent specification explicitly states that “[o]ther wall configurations, including different wall constructions and materials, are within the scope of the present invention.” EX1001, 4:24-26. Thus, the claimed hanger of the '626 Patent is limited only by its recited structural elements, not its use case, and thus is not limited to a specific wall configuration. EX1003, ¶50.

B. The '626 Patent Prosecution History

Before examination of the application that issued as the '626 Patent, Applicant filed a preliminary amendment canceling originally-filed claims 1–20 and adding new claims 21-40, which included five independent claims—claims 21, 25, 29, 33, and 37. EX1002, 455–468.

During prosecution, the Office issued one Office Action before ultimately allowing the application. *See generally* EX1002. In the Office Action, the Examiner rejected independent claims 21, 29, 33, and 37 as being obvious over Japanese App. Pub. No. JPH0314482Y2 to Tsukamoto, in view of Bundy.

EX1002, 266–279. The Examiner allowed independent claim 25. EX1002, 279–280.

In response, Applicant canceled independent claims 21, 25, and 29; amended independent claims 33 and 37 to recite a “the back flange arranged to engage a vertical face of the top plate of the frame wall;” and added new dependent claims 41-144. EX1002, 160–199. In its remarks, Applicant argued that Tsukamoto fails to disclose “a back flange extending from an edge of the top flange,” as recited in independent claims 33 and 37. EX1002, 184–196. Applicant also raised patentability arguments against references—Gilb’792 and Robinson—that were applied in PGR2021-00109. EX1002, 197–198.

The Office issued a Notice of Allowance without further commentary on the patentability of the amended claims. On June 13, 2023, the Office issued a Certificate of Correction making changes to issued claims 42, 52, 84, 95, and 105, per Patent Owner’s request.

C. Background of the Art

The ’626 Patent includes two independent claims—claims 1 and 53—each reciting a hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon. EX1001, 12:14–36, 18:16–38. The claims of the ’626 Patent recite well known elements for a joist hanger, including a channel-shaped portion for receiving a structural component and a

connection portion having a back flange for engaging a vertical face of a top plate and a top flange for engaging a top surface of the top plate. EX1003, ¶¶48–74; EX1001, 12:14–36, 18:16–38. The '626 Patent broadly claims the concept of “spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane.” EX1001, 12:14–36, 18:16–38. But these recited elements and concepts were well known prior to the earliest claimed filing date, as demonstrated below by the prior art. EX1003, ¶51.

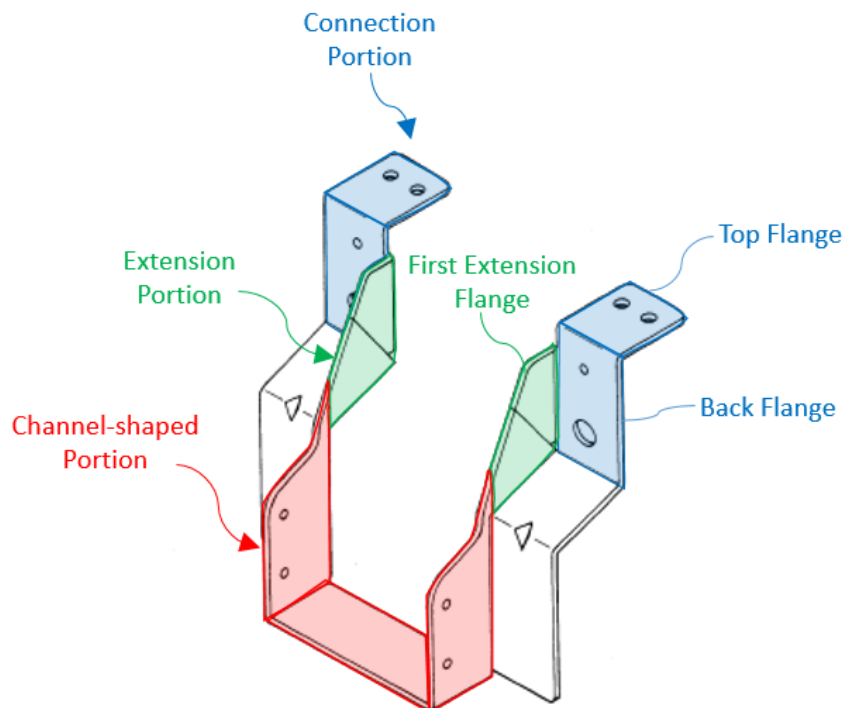
1. Joist and Truss Hangers

Hangers for supporting structural components in construction and engineering have been commonly used for a long time. EX1003, ¶32. Traditionally, hangers have been used in building construction to secure the ends of joists, trusses, or other structural members to headers, walls, or other support members. *Id.* For example, hangers have long included a channel-shaped portion (e.g., U-shaped) for receiving and supporting a structural component. EX1003, ¶33–35. Conventional hangers also include mechanisms for connecting the hanger to a wall, and stabilizing the hanger thereon, including back and top flanges. *Id.*

2. Hangers Having an Extension Portion Spacing a Channel-Shaped Portion and a Connection Portion in a Rigidly-Fixed Spaced Apart Relation

Long before the '626 Patent, joist hangers commonly included an extension portion that interconnected a channel-shaped portion and a connection portion in a rigidly-fixed spaced-apart relation, as evidenced by Yamaguchi, Cullen, and Adams, and as a taught by Bundy. EX1003, ¶¶36–41.

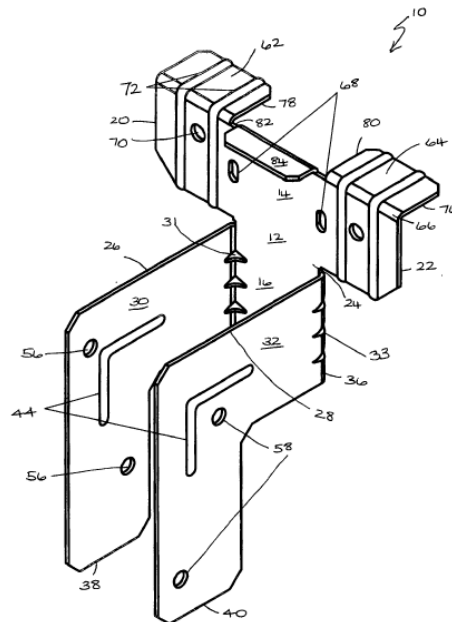
Yamaguchi relates to “a joist bracket [i.e., a hanger] that is attached to sill[] and bears a joist bridging the sill[].” (EX1041, p. 1.) As shown below, Yamaguchi’s hanger includes a channel-shaped portion (annotated red) that is separated from a connection portion (annotated blue) via an extension flange (annotated green). EX1003, ¶¶37–38.



EX1041, Perspective, Side Views (annotated).

Cullen relates to “a bracket [i.e., a hanger] for use in timber construction.”

EX1039, 3:1–3. Cullen’s hanger 10 includes “a back plate 12 for location against a support heading member or bearing member.” *Id.*, 10:16–18. Cullen’s hanger 10 includes “sidewalls 30, 32 extend[ing] forward of the back plate 12 sitting parallel to each other and perpendicular to the back plate 12.” *Id.*, 10:25–27. Cullen’s hanger 10 includes legs 38, 40 “extend[ing] downwardly” from sidewalls 30, 32 to “provide an increased surface area to support a joist.” *Id.*, 10:29–11:2. While not shown in the figures, Cullen’s hanger 10 is described as including “a seat located on the legs 38, 40 ... to cradle a joist.” *Id.*, 17:20–23. As shown below, Cullen’s legs 38, 40 are spatially separated from back plate 12 by a distance corresponding to the length of sidewalls 30, 32. EX1003, ¶39.



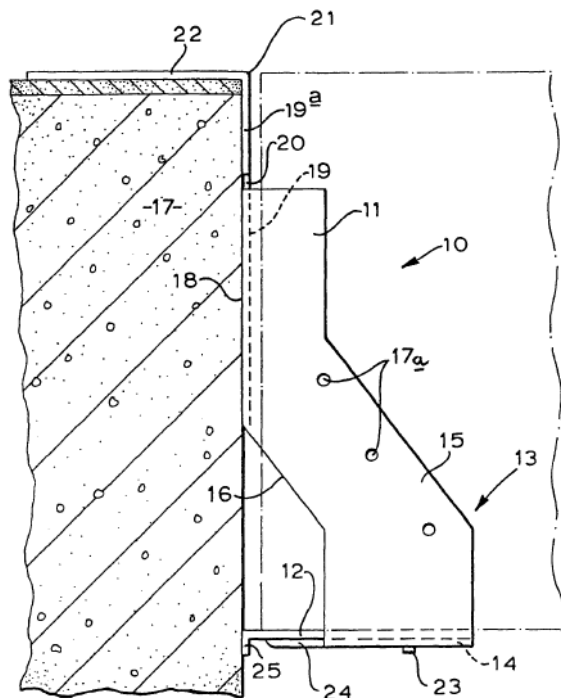
EX1039, FIG. 1.

Adams “relates to a joist hanger ... for supporting a generally horizontal structural timber ... from a load bearing wall of a building.” EX1040, 1:0–8.

Adams’s hanger 10 includes “a stirrup part ... which includes a base 14 and pair of substantially upright sidewalls 15 spaced to form a seating for a joist.” *Id.*, 4:2–

5. Adams's hanger 10 includes "an abutment portion 19 which lies against the forward face of [the wall's] support element 17." *Id.*, 4:22–26. Adams's sidewalls 15 "extend upwardly and rearwardly ... away from the base 14" so that "base 14 is positioned away from the supporting element 17" such that "the end of the joist can be ventilated through the opening behind the inclined edge of the sidewalls."

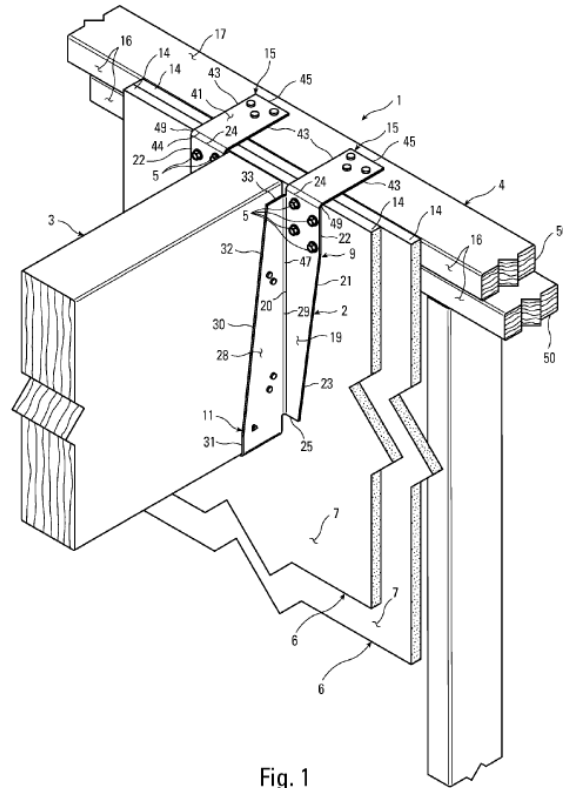
Id., 4:11–19; EX1003, ¶40.



EX1040, FIG. 2.

3. Hangers Permitting Drywall between its Channel-Shaped Portion and a Vertical Face of a Wall Member.

Defining a drywall space between a hanger's channel-shaped portion and a vertical face of a wall member was not inventive. EX1003, ¶¶36-43. For example, as mentioned above, in §III.C.2, each of Yamaguchi, Cullen, and Adams disclose hangers defining a space between a wall member's vertical face and a channel-shaped portion. Likewise, Bundy discloses a hanger for supporting a joist's end away from a wall. EX1007, Abstract. Bundy's joist hanger expressly describes an extension portion accommodating two layers of 5/8" thick fire-resistant drywall between the hanger's channel-shaped portion and the wall member's vertical face. EX1007, FIG. 1, 5:16–20.



EX1007, FIG. 1.

Thus, the claim elements directed to the '626 Patent's alleged inventive concept recite nothing more than what was already in the prior art and would have been well known to a POSITA. EX1003, ¶¶32–46.

D. Level of Ordinary Skill in the Art

A POSITA at the time of the earliest claimed filing date of the '626 Patent would have had an education background of, or practical experience providing an equivalent to, a Bachelor of Science in Mechanical Engineering, Structural Engineering or a related/equivalent field and at least four years of work experience in construction connector design/development. EX1003, ¶¶12–15.

E. Claim Construction

Generally, the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005), applies to this proceeding. 83 Fed. Reg. 51,341 (Oct. 11, 2018); 37 C.F.R. §42.200. Under this standard, the claims' words are given their plain meaning, which is the meaning understood by a POSITA at the time of the alleged invention after reading the entire patent. *Phillips*, 415 F.3d at 1312-13.

1. Constructions from PGR2019-00063

In PGR2019-00063, the PTAB construed the following terms:

- “extend through”: “in the context of element A ‘extend[ing] through’ element B, [] ‘element A extends into one side and out the other of element B’” (FWD, 45);
- “configured to extend through” the sheathing¹: “extending into one side and out of the other side of the sheathing” (FWD, 51);
- “extending from”: “in the context of element B extending from element A, the beginning of element B’s extension is on element A” (FWD, 110);

¹ For purposes of this Petition, “sheathing,” as construed by the Board in the ’510 and ’867 patents,” is equivalent to “drywall” of the ’626 patent.

- “rigidly fixed”: “components are connected such that they do not move freely with respect to each other” (FWD, 98).

2. Constructions from PGR2021-00109

In PGR2021-00109, the PTAB construed the following terms:

- “each extension flange lying in an extension flange plane”: “for each extension flange an extension flange plane is within the extent of the extension flange from the channel-shaped portion to the connection portion” (FWD, 31);
- “configuring extension flanges to extend into one side and out the other side of sheathing”: “the extension flanges define a space between the back flange of the connection and the channel-shaped portion to receive sheathing therein” (FWD, 68)

Given the Specification is identical between the present patent and the ’510 and ’867 Patents (the subject of the Board’s prior decisions), Petitioner applies the same construction to the same terms in the present claims. Unless otherwise noted, Petitioner submits that the remaining claim terms should be given their plain and ordinary meaning. EX1003, ¶¶16–20.

IV. THE BOARD SHOULD NOT DENY INSTITUTION UNDER SECTION 325(D).

The Board should not deny institution under § 325(d) here because grounds 1–5 are substantially different than the art and arguments previously considered by the Office. Indeed, each ground relies on prior-art never presented to the Patent Office during prosecution and raises arguments never considered by the Office. This reason alone shows the Board should not exercise its discretion to deny institution. See *Allgenesis Biotherapeutics Inc. v. Cloudbreaker Therapeutics, LLC*, IPR2020-01438, Paper 7, 12 (P.T.A.B. Feb. 18, 2021).

Although Bundy was previously considered by the Office, Bundy is used as a secondary reference to disclose limitations— spacing a channel-shaped portion of a fire wall hanger from the wall frame to receive two layers of 5/8-inch-thick drywall and providing the channel-shaped portion with a stop—that were not material to the alleged patentability of the claims during prosecution. See *Grimco, Inc. v. Principal Lighting Grp.*, IPR2021-00968, Paper 13, 19-21 (P.T.A.B. Nov. 22, 2021). And the other references combined with Bundy—Yamaguchi, Cullen, and Adams—were never seen by the Office. These new references disclose a feature— a back flange extending from an edge of a top flange —that was deemed by the Examiner to be missing in the cited art and was the basis for the '867 patent claims remaining patentable after the FWD in the -00109 proceeding. See *Agrofresh Sols. Inc. v. Lytone Enter., Inc.*, IPR2021-00451, Paper 11, 12-13

(P.T.A.B. July 27, 2021) (declining to deny institution under §325(d) where the new art addresses shortcomings of the previously presented art.); *Oticon Med. AB v. Cochlear Ltd.*, IPR2019-00975, Paper 15, 18-20 (P.T.A.B. Oct. 16, 2019) (precedential) (declining to deny institution under §325(d) where previously applied reference was combined with reference not previously considered). As detailed below, Yamaguchi, Cullen, and Adams are materially different than art applied during prosecution, and therefore, are *not* cumulative over previously presented art. *See infra* Section VII. Accordingly, *Becton* factors (a), (b) weigh heavily in favor of the Board granting institution.

Because Yamaguchi, Cullen, and Adams were neither presented to the Office nor cumulative to previously considered art, the applicant made no arguments during examination against the combinations of prior-art applied here—directly relating to *Becton* factor (d). Lastly, under *Becton* factor (f), additional facts and evidence here— including Mr. Fennell’s declaration — warrant institution and a finding of unpatentability based on the newly asserted prior-art combinations.

V. CLAIMS 1, 9–14, 21, 29, 30, 32–36, 38, 53, 61–66, 73, 81, 82, 84–89, AND 91 WOULD HAVE BEEN OBVIOUS OVER YAMAGUCHI IN VIEW OF BUNDY.

Yamaguchi, as modified in view of Bundy, renders obvious claims 1, 9–14, 21, 29, 30, 32–36, 38, 53, 61–66, 73, 81, 82, 84–89, and 91 for the following reasons.

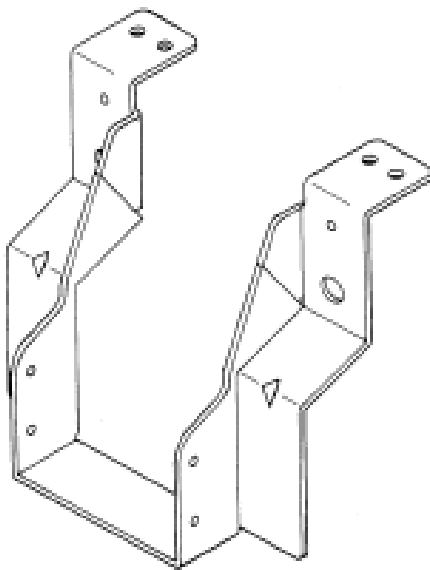
Yamaguchi discloses each and every structural element listed in independent claims 1 and 53² but does not explicitly disclose that the space defined between its channel-shaped portion and back flange is sized large enough to receive two layers of 5/8-inch-thick drywall therein. However, Bundy discloses an analogous hanger that receives two layers of 5/8-inch-thick drywall between its channel-shaped portion and the wall frame. EX1003, ¶¶75-76. A POSITA would have sought to combine the teachings of Bundy with Yamaguchi’s hanger to define a space large

² Yamaguchi’s captions appear above its figures, whose poor alignment leads to some confusion. For example, the figures on Yamaguchi, p. 2, are its “[Perspective View]” and its “[Front View],” respectively, although the captions on p. 2 read “[Front View]” followed by “[Back View].” For avoidance of confusion, Yamaguchi’s figures are referenced in this Petition using the captions appearing immediately *above* the figure itself. For example, Petitioner refers to the first figure on Yamaguchi, p. 2 as the “perspective view.”

enough for receiving two layers of 5/8-inch-thick drywall with a reasonable expectation of success, as explained below.

A. Motivation to Modify Yamaguchi Based on the Teachings of Bundy.

Yamaguchi and Bundy are both directed to joist hangers. EX1003, ¶¶57–71, 77. Yamaguchi's hanger defines a space between its back flange and channel-shaped portion corresponding to the length of its extension portion. EX1003, ¶77. Bundy discloses sizing an extension portion of an analogous hanger to receive two 5/8"-thick-layers of drywall between its channel-shaped portion (seat member 12) and the front face 6 of the wall's support member 4. *Id.*, ¶¶77–81; EX1007, 5:16–18. Two 5/8" thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶79.



EX1041, Perspective View;

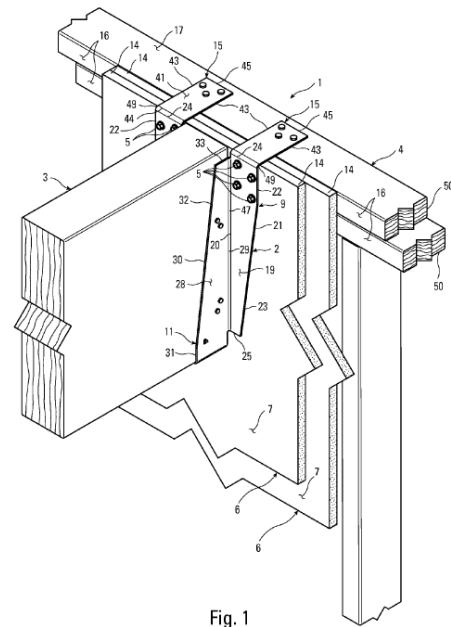


Fig. 1

EX1007, FIG. 1.

Given that Yamaguchi's hanger is intended for securing a joist to a wall, a POSITA would have sought to use Yamaguchi's hanger to secure a joist to a wooden frame wall. EX1041, p. 1; EX1003, ¶¶78-79. Bundy teaches receiving drywall between a hanger's channel-shaped portion and the front surface of the top plate to shield the frame wall, and discloses advantages for accommodating two layers of 5/8" drywall between a wall frame and a structural member held by a hanger for fire resistance in a fire separation wall. Accordingly, a POSITA would have been motivated to receive drywall between Yamaguchi's back flange and channel-shaped portion to provide a shielded fire resistant wooden frame wall. EX1003, ¶¶80-81; EX1007, 2:10-24. Specifically, a POSITA would have optimized the size of the spacing between Yamaguchi's back flange and channel-shaped portion to accommodate two layers of 5/8"-thick-drywall according to the size preference described by Bundy for optimal fire protection and wall integrity. EX1003, ¶¶81-82; EX1007, 5:10-22. This modification to Yamaguchi would have been nothing more than applying a known technique (Bundy's spacing a hanger seat from a wall frame by distance sufficient to accommodate two 5/8"-thick-drywall sheets for fire resistance) to a similar device (Yamaguchi's hanger having a spacing of indeterminate length) to obtain the predictable result of a firewall hanger having a space between its channel-shaped portion and a wall frame large

enough for receiving drywall therebetween, thereby “protect[ing] the structural members of a building.” EX1007, 5:18-20; EX1003, ¶82.

A POSITA would have had an expectation of success in modifying Yamaguchi’s hanger to include a space large enough to receive two layers of 5/8”-thick drywall between its channel-shaped portion and back flange, because doing so would still allow Yamaguchi’s hanger to perform its intended function of securing a joist to a wall. EX1041, 1; EX1003, ¶83. Recognizing that Yamaguchi’s and Bundy’s hangers are constructed from sheet metal blanks, a POSITA would have understood how to modify the size of Yamaguchi’s extension portions to accommodate two layers of 5/8”-thick-drywall while still allowing Yamaguchi’s hanger to secure a joist’s end to a frame wall. EX1003, ¶83; EX1007, 4:47-51. Doing so would have been well within the level of ordinary skill in the art. EX1003, ¶83.

Yamaguchi illustrates a space between an installed joist and a back flange of its hanger. While Yamaguchi’s described setting is a sill plate, a POSITA would have recognized that the hanger’s structure is nonetheless useful in a variety of constructions, such as on a top plate of a frame wall, and would have been motivated to use Yamaguchi’s hanger on a wood frame wall in particular so that sheathing could be installed in the space behind the joist as taught by Bundy. *Id.*, ¶¶80-83. Furthermore, even if Yamaguchi’s hanger were to be used on a sill plate,

a POSITA would have sought to increase the distance between the back flange and the channel shaped portion to accommodate drywall in the construction shown in Yamaguchi's Usage View (EX1041, 5) because drywall is commonly attached to sills, foundation walls, and the like, even in basements, where moisture resistant materials mitigate any seepage that might otherwise occur where finishing, soundproofing, or vibration-proofing is desired. *Id.*, ¶84. Indeed, it was well known to provide drywall with moisture-retarding paint/claddings to preserve the integrity of the drywall, even when exposed to moisture. *Id.*, ¶84. Accordingly, a POSITA would have been motivated to configure Yamaguchi's hanger to include sufficient space for receiving two layers of 5/8-inch-thick-drywall between Yamaguchi's back flange and channel-shaped portion so that any underlying wall frame is covered and protected. EX1003, ¶85; EX1007, 5:10-22.

B. Independent Claim 1

[1.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

Initially, the preamble “for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall” recites an intended use of the claimed invention, satisfied by any prior art structure capable of performing the intended use. EX1003, ¶86; *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997); *see also Rowe v. Dror*, 112 F.3d

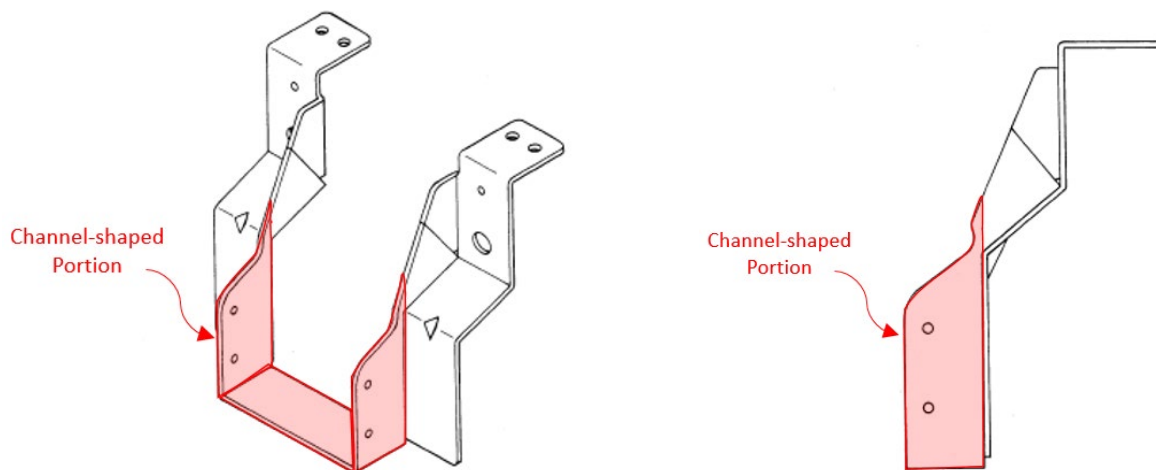
473, 478 (Fed. Cir. 1997). Just as the Board found the preamble not limiting in the '510 and '867 patents (-00109 FWD, 48; -00063 FWD, 36), the preamble of claim 1 is not limiting because the patentee recites a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use.

To the extent that the preamble is limiting, the Yamaguchi-Bundy combination (“Yamaguchi-Bundy”) renders obvious such a hanger for connecting a structural component to a wall. EX1041, 1–5; EX1003, ¶87. Yamaguchi explicitly discloses using hanger 10 for “bear[ing] a joist” but not explicitly for securing the joist to a wall adapted to have two-layers of 5/8-inch-thick drywall mounted thereon. EX1041, 1. A POSITA not only would have understood that Yamaguchi’s hanger would be applicable to a wall covered with drywall, as suggested by Bundy, but that Yamaguchi’s hanger would be applicable to a fire separation wall having two layers of 5/8-inch-thick drywall mounted on a frame wall, as further suggested by Bundy. EX1003, ¶87; EX1007, 2:37-41, 5:10–21. A POSITA would have also understood that Yamaguchi’s hanger is configured to secure to a top plate of a frame wall by connecting Yamaguchi’s hanger directly to the top plate, as taught by Bundy. EX1003, ¶87. Accordingly, it would have been obvious to a POSITA to use Yamaguchi’s hanger to connect a structural component to a top plate of a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon. *Id.* Such a modification would have been simply

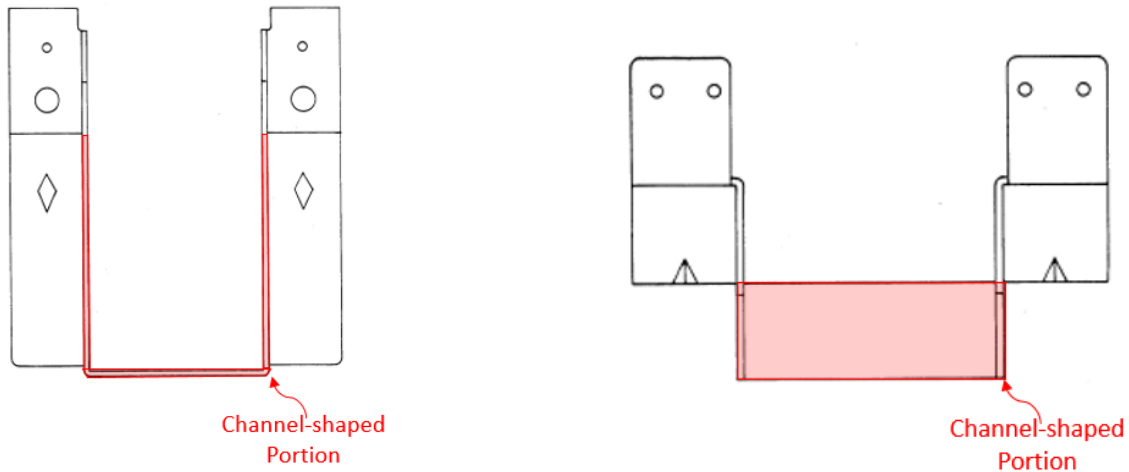
applying a known technique (Bundy's use of a hanger on a frame wall with two layers of 5/8-inch-thick drywall to create a fire separation wall) to a known device (Yamaguchi's hanger) to obtain the predictable result of optimizing the size of the hanger's spacing to receive the drywall, thereby shielding wall structures from fire. *Id.*; see, e.g., EX1007, 5:18-19. A POSITA would have had an expectation of success in using Yamaguchi's hanger with drywall-covered wall because Bundy's and Yamaguchi's hangers serve similar purposes—supporting a floor joist/structural beam at a top end of a wall. EX1003, ¶¶87-88.

[1.1] “a channel-shaped portion configured to receive the structural component,”

Yamaguchi discloses a channel shaped portion (highlighted in red below) configured to receive the structural component. EX1003, ¶¶89-90; EX1041, 1–5 (“joist bracket that...bears a joist”).



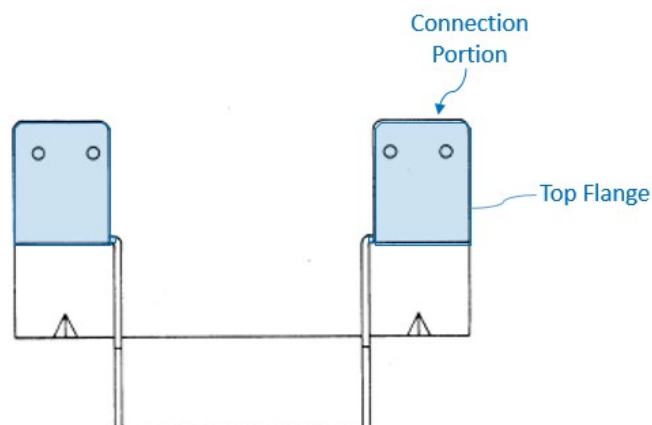
EX1041, Perspective, Side Views (annotated).



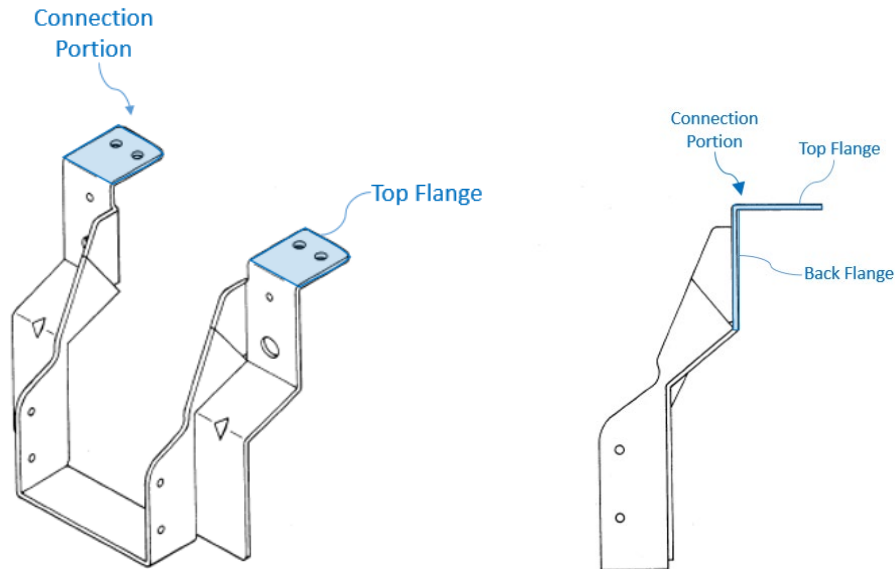
EX1041, FIGS. Front, Plan views (annotated).

[1.2.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

Yamaguchi discloses a connection portion (highlighted in blue below) that includes a top flange (blue—horizontal portion) arranged to engage a top surface of a top plate of the frame wall, as suggested by Bundy. EX1003, ¶¶91-92; EX1041, 2–5.



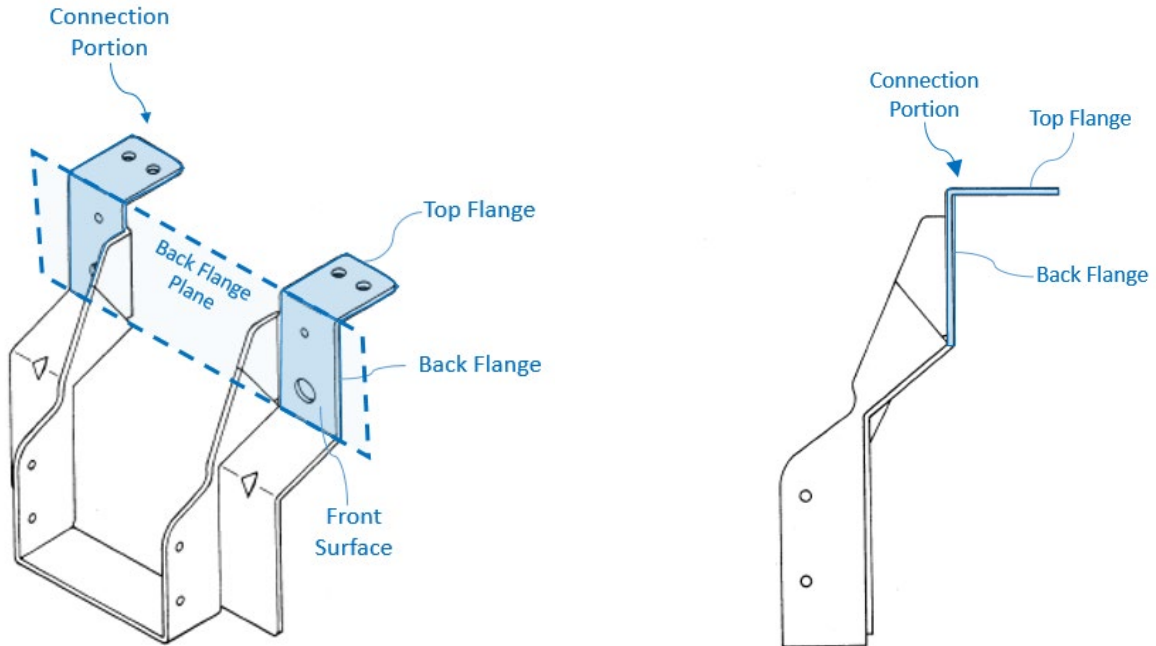
EX1041, Plan Views (annotated).



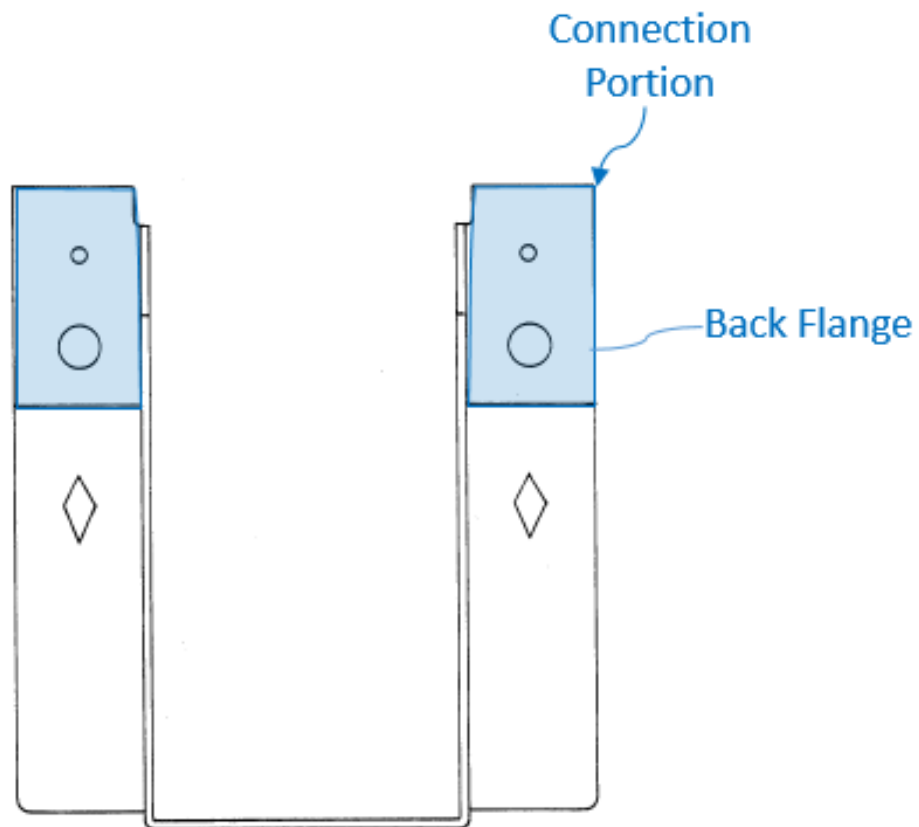
EX1041, FIGS. Perspective, Side Views (annotated).

[1.2.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

Yamaguchi discloses a back flange (highlighted in blue below—vertical portion) extending from an edge of the top flange (blue), the back flange arranged to engage a vertical face of the top plate of the frame wall, when installed on a frame wall as taught by Bundy, the back flange having a front surface (blue) lying in a back flange plane (annotated below). EX1003, ¶¶93-94; EX1041, 2–5.



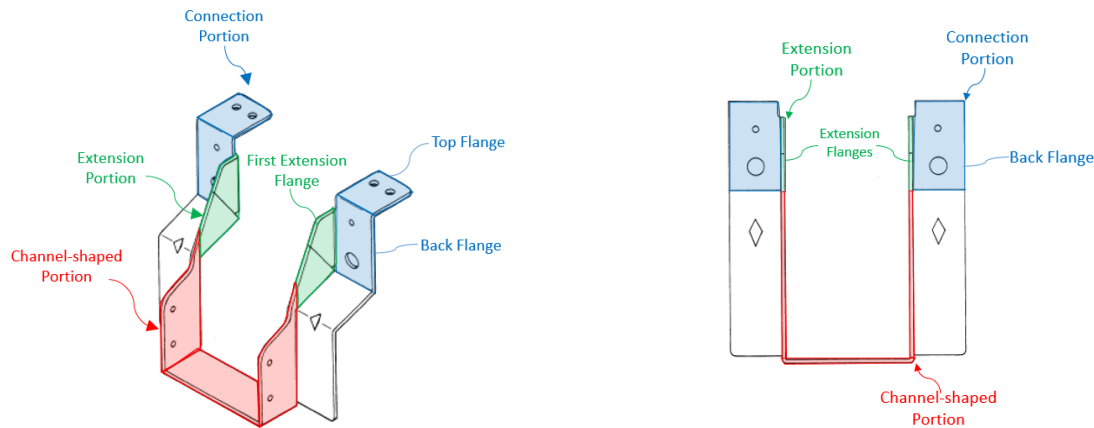
EX1041, Perspective, Side Views (annotated).



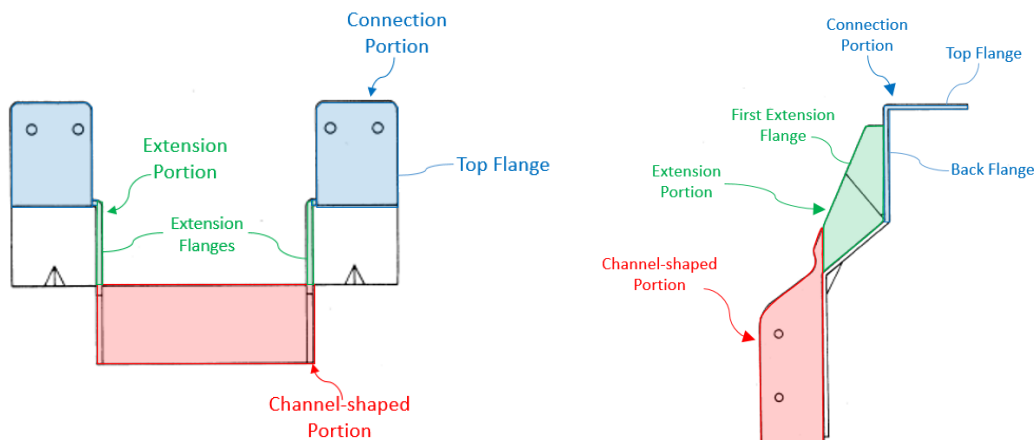
EX1041, Front View (annotated).

[1.3.A] “an extension portion including a first extension flange extending from the back flange of the connection portion to the channel-shaped portion;”

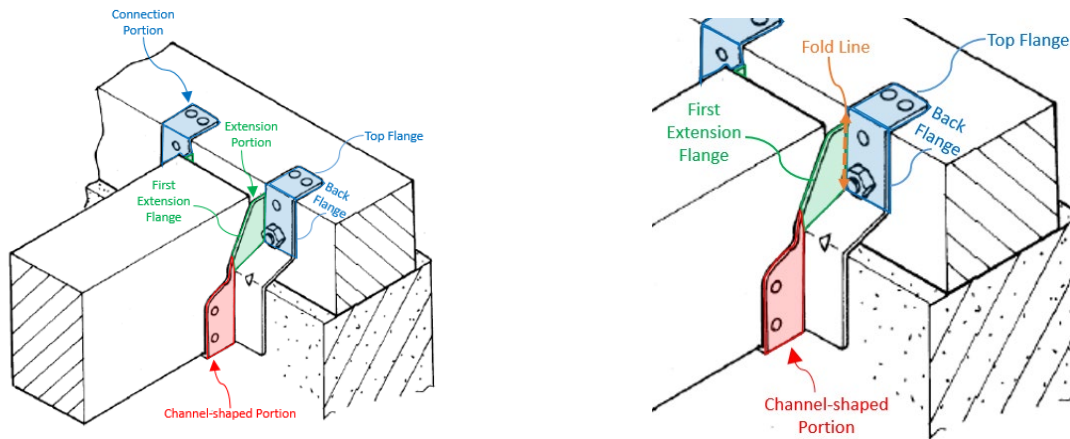
Yamaguchi discloses an extension portion (highlighted in green below) including a first extension flange (green-vertical portion) extending from the back flange (blue-vertical portion) of the connection portion to the channel-shaped portion (red) (and vice versa). EX1003, ¶95; EX1041, 1–5.



EX1041, Perspective, Front Views (annotated).



EX1041, Plan, Side Views (annotated).



EX1041, Usage View (annotated).

A POSITA would have understood in view of all Yamaguchi's figures that its extension flange may be formed in multiple ways to define a planar-shaped flange extending from channel-shaped portion (red) to connection portion (blue). *See generally* EX1041; EX1003, ¶96. A POSITA would have understood from Yamaguchi's figures that one embodiment of its extension flange is a combination of two abutting pieces of sheet metal (that may or may not be joined together; e.g., via welding), as shown by the line on the vertical portion of the extension flange on pp. 2-4, to define a planar-shaped flange extending from the channel-shaped portion (red) to the connection portion (blue) with no intervening components therebetween (and vice versa). EX1003, ¶¶96-97; EX1041, 2-4. Furthermore, a POSITA would have understood that from the embodiment shown in the Usage View which has no join line crossing the flange, that the extension flange is

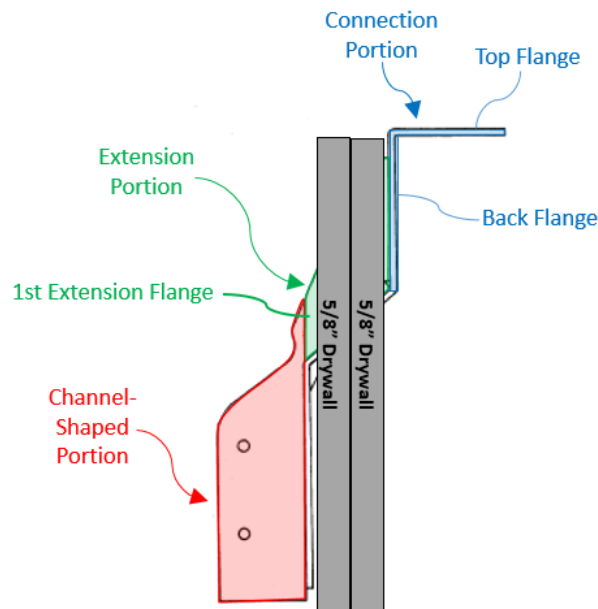
alternatively formed by bending a contiguous piece of sheet metal along a fold line (annotated above) defined along the side edge of its back flange, such that the extension portion spans between the back flange and the channel-shaped portion with no intervening components therebetween. EX1003, ¶¶96-97; EX1041, 5. Accordingly, under either embodiment, Yamaguchi discloses the recited “extension flange” of claim 1. EX1003, ¶¶97; EX1041, 1–5.

[1.3.B] “the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane”³

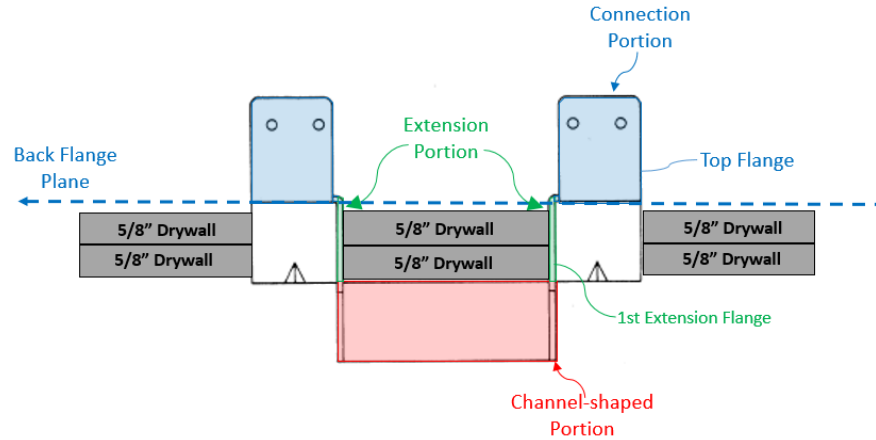
Yamaguchi’s extension portion (green below) defines a space that would permit drywall to be inserted between its back flange (blue—vertical portion) and channel-shaped portion (red). EX1003, ¶98; EX1041, 2–5. While Yamaguchi does not explicitly disclose installing two layers of 5/8-inch-thick drywall between its back flange plane (blue) and channel-shaped portion (red), a POSITA would have found it obvious to size the length of Yamaguchi’s extension flanges (green) to

³ In its district court complaint, Patent Owner alleges that drywall located outside of Simpson’s hanger and *offset from the channel-shaped portion* of Simpson’s hanger constitutes “drywall ... received between the channel-shaped portion and the back flange plane.” EX1042, ¶¶44–48.

define a space sufficient for receiving two layers of 5/8-inch-thick drywall therein based on Bundy. EX1003, ¶98. Bundy teaches installing two layers of 5/8" sheathing between a hanger's channel shaped portion (Bundy's side members 11) and a wall frame. EX1007, 5:18-20; EX1003, ¶98. A POSITA would have had an expectation of success in defining a specifically-sized drywall space between Yamaguchi's back flange plane (blue) and channel-shaped portion (red), because Yamaguchi's and Bundy's hangers are used for similar purposes (e.g., hanging a joist to a wall), and because Yamaguchi's extension portion (green) already defines a space between Yamaguchi's back flange plane (blue) and channel-shaped portion (red). EX1003, ¶98; EX1007, 4:46-51; EX1041, 2-5; *see also* §V.A.



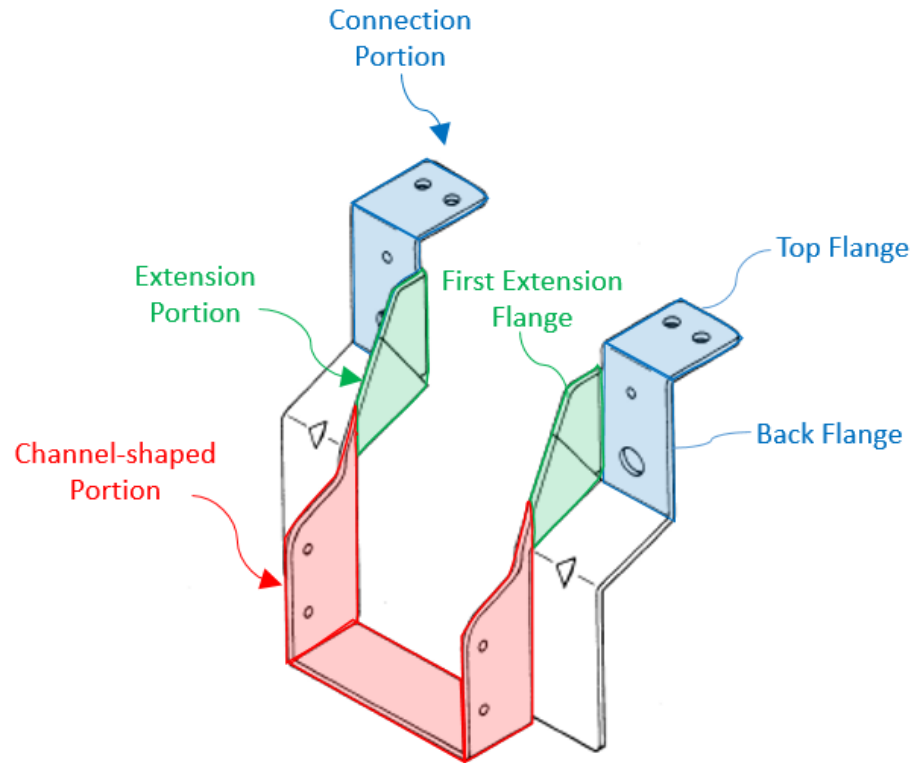
EX1041, Side View (annotated).



EX1041, Plan View (annotated).

[1.4] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

Based on the hanger shown in the figures of Yamaguchi and its description as a “bracket that...bears a joist,” a POSITA would have understood that all portions of Yamaguchi’s hanger are connected such that they do not move freely with respect to each other. EX1003, ¶99; EX1041, 1–5. Yamaguchi thus discloses the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another. EX1003, ¶100.



EX1041, Perspective View (annotated).

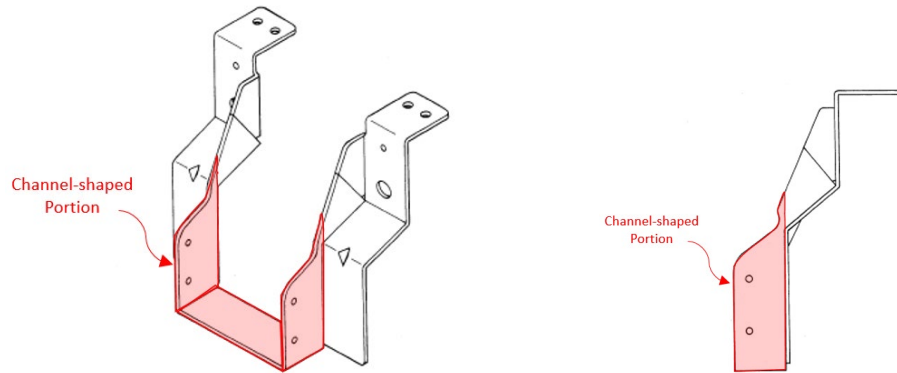
C. Independent Claim 53

[53.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

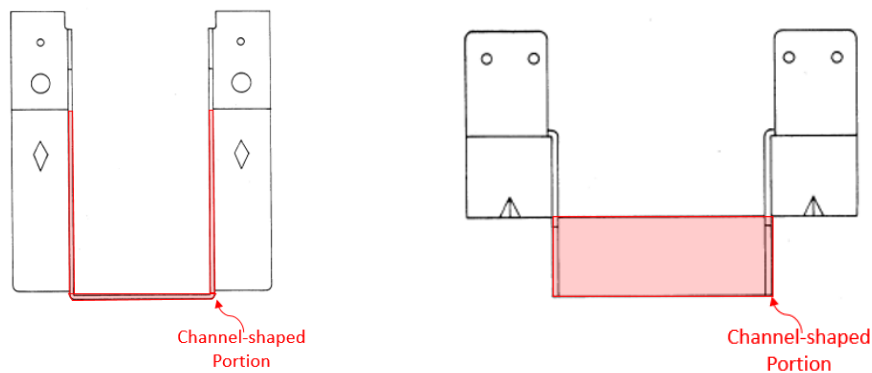
As discussed above with respect to claim 1, element [1.P], Yamaguchi–Bundy renders obvious this limitation. EX1003, ¶¶101-102; EX1041, 2–5.

[53.1] “a channel-shaped portion configured to receive the structural component,”

As discussed with respect to claim 1, element [1.1.A], Yamaguchi discloses this limitation. EX1003, ¶103; EX1041, 2–5.



EX1041, Perspective, Side Views (annotated).

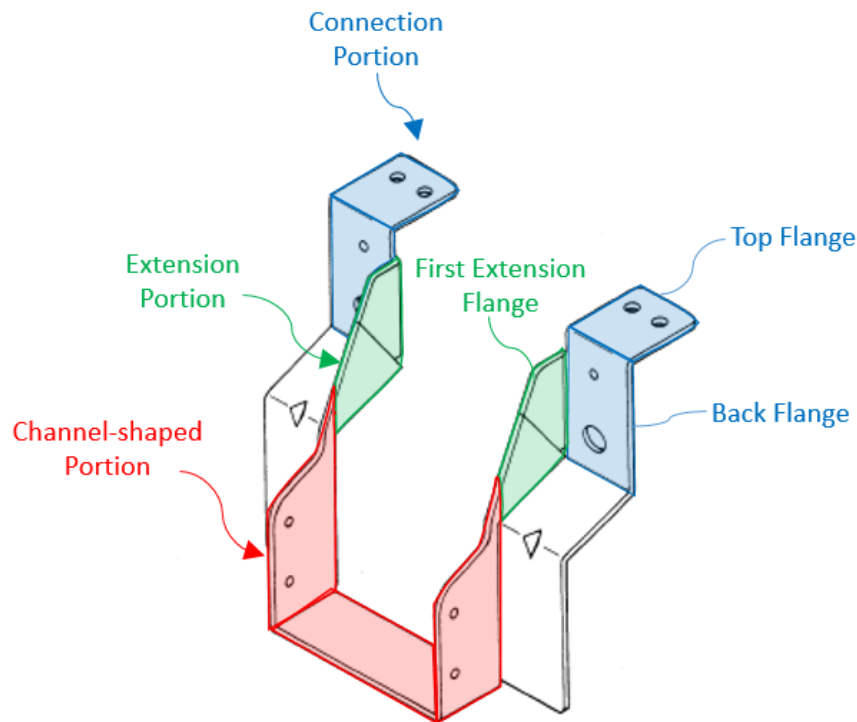


EX1041, FIGS. Front, Plan Views (annotated).

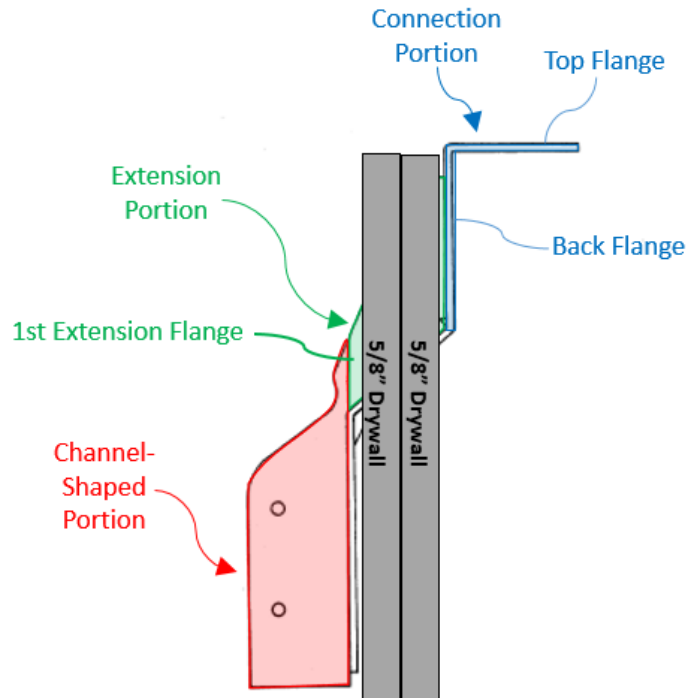
[53.2] “an extension portion extending from the channel-shaped portion and configured to extend through the two layers of 5/8-inch-thick drywall;”

Yamaguchi discloses its extension portion extending from the channel-shaped portion. EX1003, ¶104; EX1041, 2–5. While Yamaguchi does not explicitly disclose extending its extension portion through drywall, a POSITA would have been motivated to size the length of Yamaguchi’s extension portion (green) long enough to define a space sufficient to receive two layers of 5/8-inch-thick drywall between Yamaguchi’s back flange (blue) and channel-shaped portion

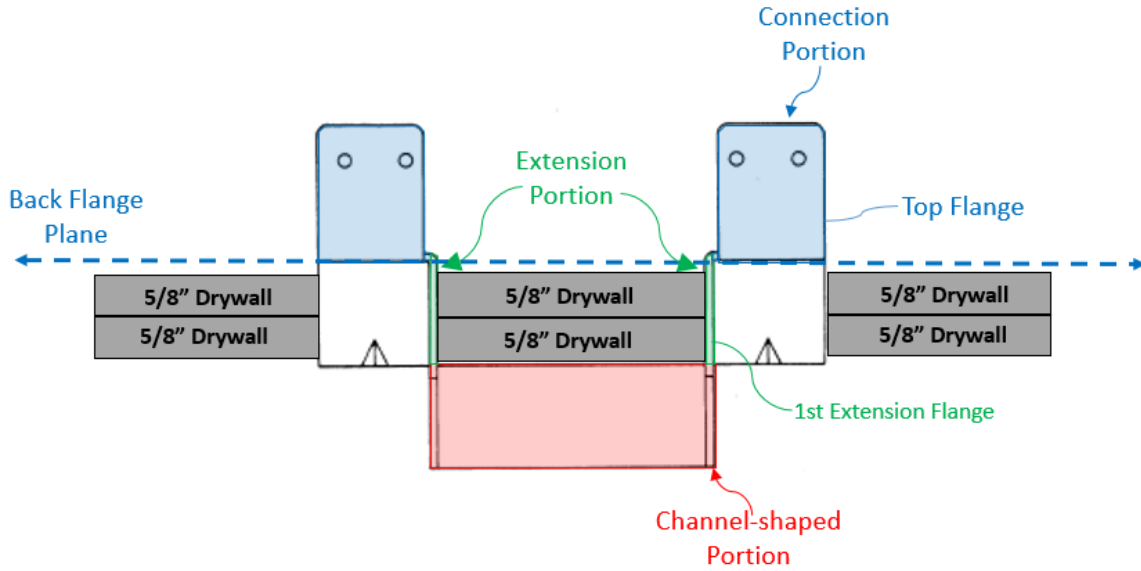
(red), as taught by Bundy. EX1003, ¶105; EX1007, 5:18-20. In doing so, a POSITA would have understood that Yamaguchi's extension portion (green) is configured to extend into one side of the drywall and out of the other side of the drywall because Yamaguchi's extension portion is flat sheet metal extending continuously from its channel-shaped portion to its connection portion, just as the extension flanges described in the '626 patent. EX1003, ¶105. Thus, Yamaguchi's extension portion is configured to extend through the two layers of 5/8-inch-thick drywall. *Id.*, ¶106.



EX1041, Perspective View (annotated).



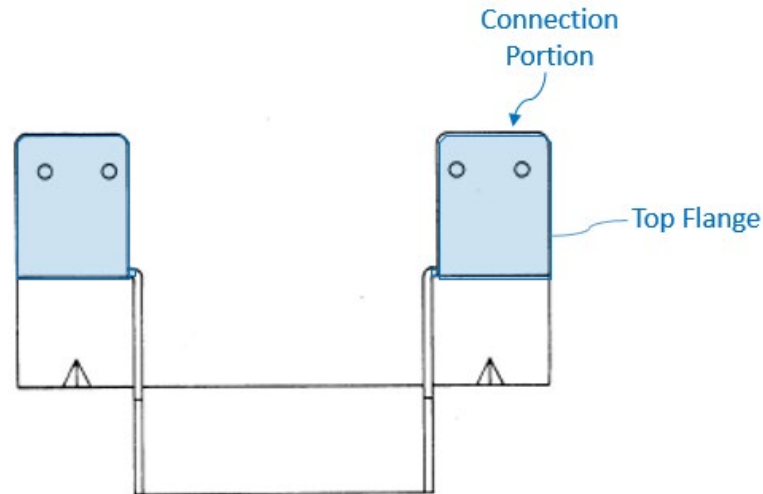
EX1041, Side View (annotated).



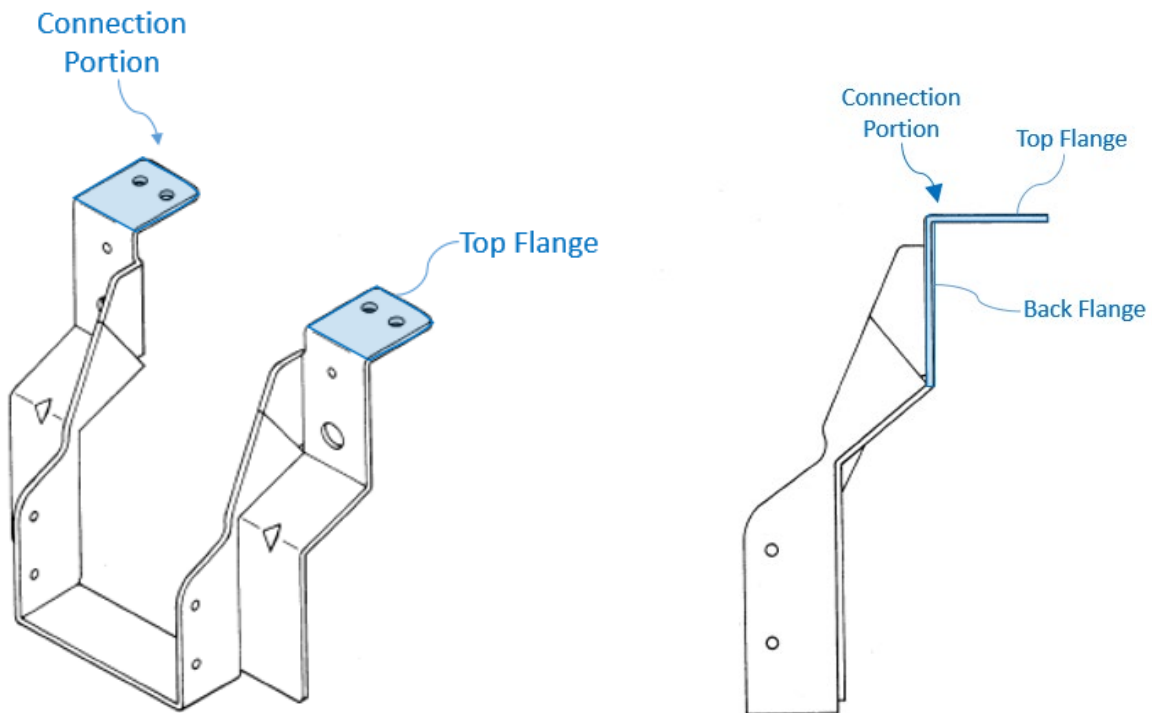
EX1041, Plan View (annotated).

[53.3.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

As discussed above with respect to claim 1, element [1.2.A], Yamaguchi-Bundy renders obvious this limitation. EX1003, ¶107; EX1041, 2–5.



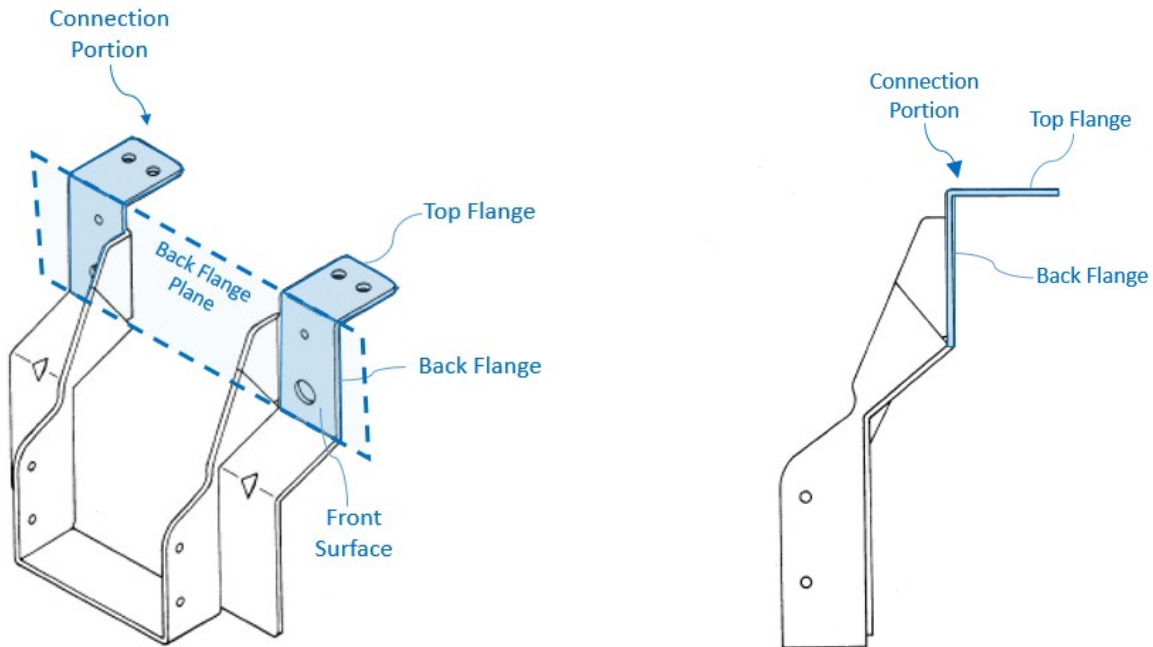
EX1041, Plan View (annotated).



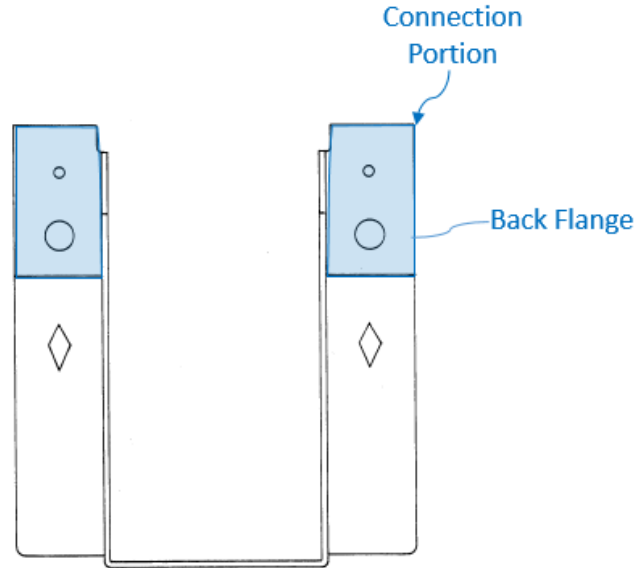
EX1041, Perspective, Side Views (annotated).

[53.3.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

As discussed above with respect to claim 1, element [1.2.B], Yamaguchi-Bundy renders obvious this limitation. EX1003, ¶108; EX1041, 2–5.



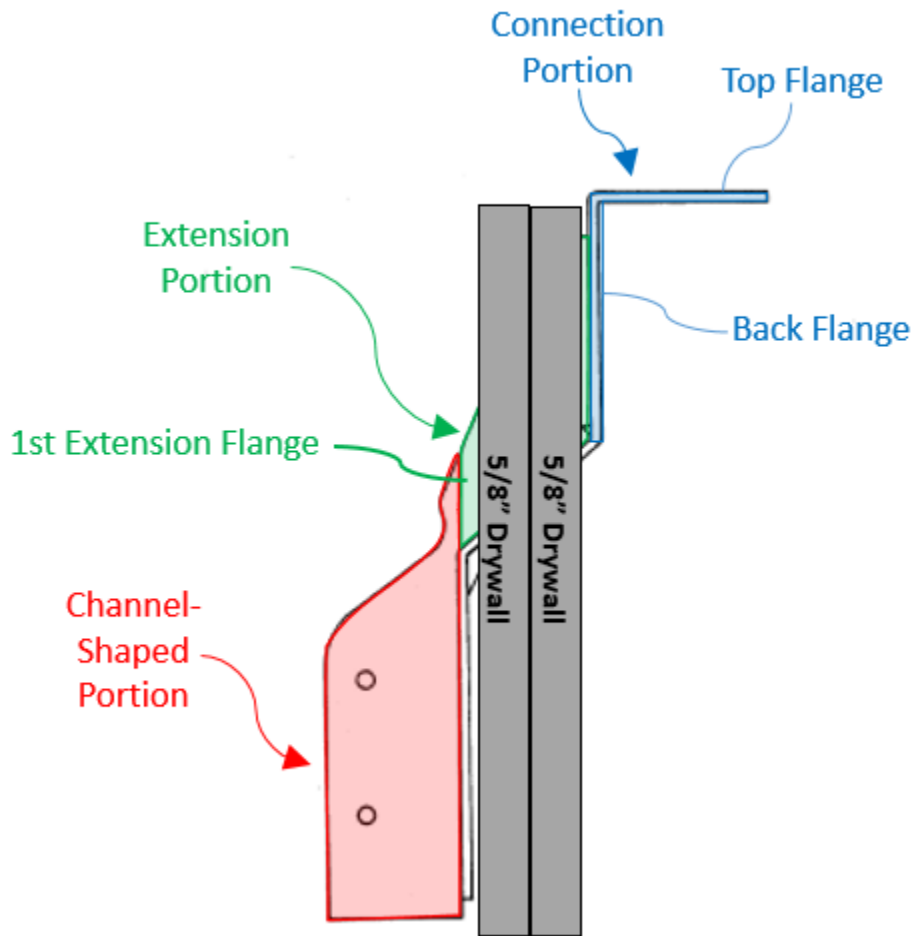
EX1041, Perspective, Side Views (annotated).



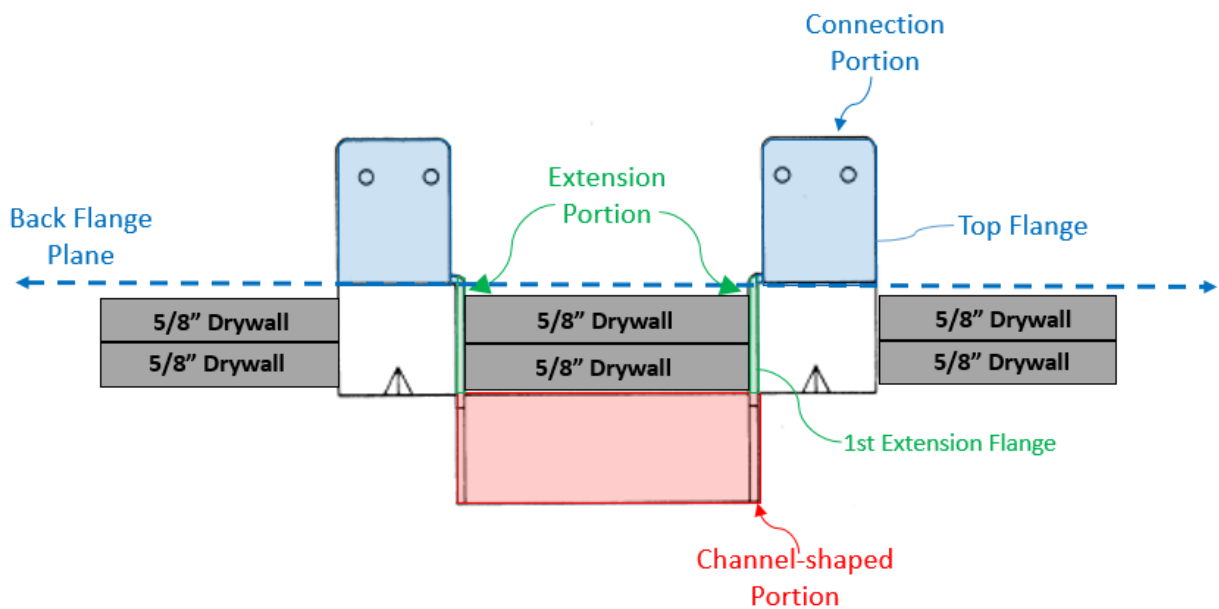
EX1041, Front View (annotated).

[53.4] “the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane”

As discussed above with respect to claim 1, element [1.3.B], Yamaguchi–Bundy renders obvious this limitation. EX1003, ¶109; EX1041, 2–5.



EX1041, Side View (annotated).



EX1041, Plan View (annotated).

[53.5] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

As discussed above with respect to claim 1, element [1.4], Yamaguchi discloses this limitation. EX1003, ¶110; EX1041, 1–5.

D. Claims 9, 13, and 61–62

As discussed in sections [1.3.A] and [53.2], Yamaguchi discloses that its two extension flanges are each directly connected to both its channel-shaped portion and its connection portion, as each extension flange extends between the two with no intervening components therebetween.⁴ Yamaguchi thus discloses the extension portion including both a first extension flange and a second extension flange (green) extending from the connection portion (blue) to the channel-shaped portion (red) (and vice-versa, from the channel-shaped portion to the connection portion, as recited in claims 61 and 62). EX1041, 2–5; EX1003, ¶111.

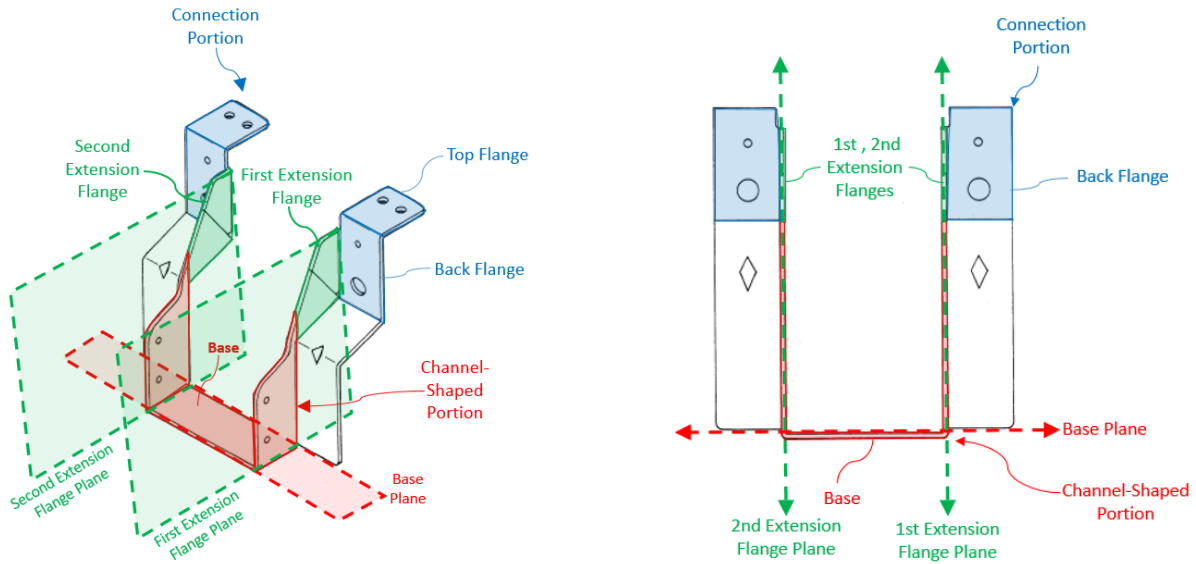
A POSITA would have understood from Yamaguchi in view of Bundy that the combined hanger is made of sheet metal, such that the first extension flange (green–vertical portion) is a flat element made of sheet metal, which thus has a surface lying in a first extension flange plane. EX1003, ¶112. For the same

⁴ “The left side view is symmetrical to the right side view.” EX1041, p. 1.

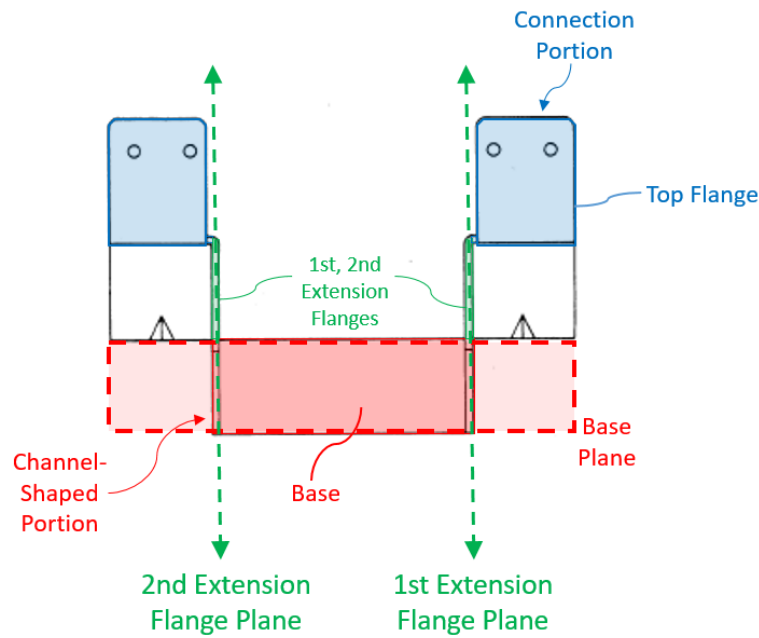
reasons, the second extension flange lies in a second extension flange plane.

Yamaguchi further illustrates that the surfaces of the extension flanges are parallel to each other (“[t]he left side view is symmetrical to the ride side”), and thus the second extension flange and plane are parallel to the first extension flange and plane, respectively, as shown below. EX1041, 1-5.

Yamaguchi discloses the channel-shaped portion (red) including a base (annotated below) configured to receive and support the structural component’s end portion. EX1041, 1–5 (“joist bracket that...bears a joist”); EX1003, ¶113. The base has an upper surface arranged to engage the structural component by receiving the structural component’s end portion. EX1041, 2–4; EX1003, ¶113. The base’s upper surface lies in a horizontal base plane, as shown below. EX1041, 2–5; EX1003, ¶113. A POSITA would have understood that such a horizontal base plane is generally perpendicular to the vertical first and second extension flanges and extension flange planes, as shown below. EX1003, ¶113. Thus, Yamaguchi-Bundy renders obvious claims 9, 13, and 61–62. EX1003, ¶114.



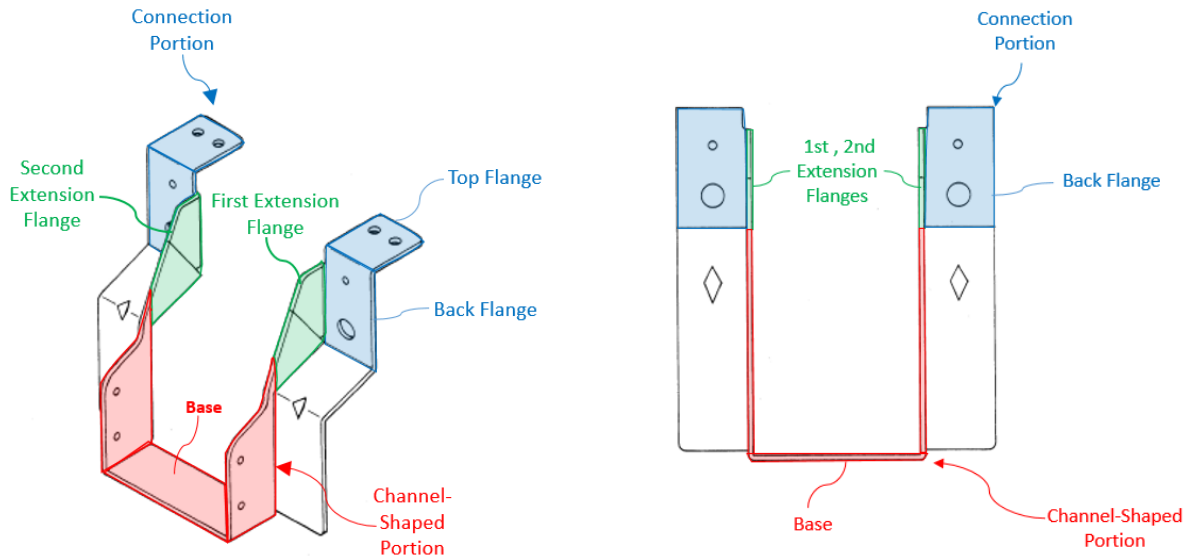
EX1041, Perspective, Front Views (annotated).



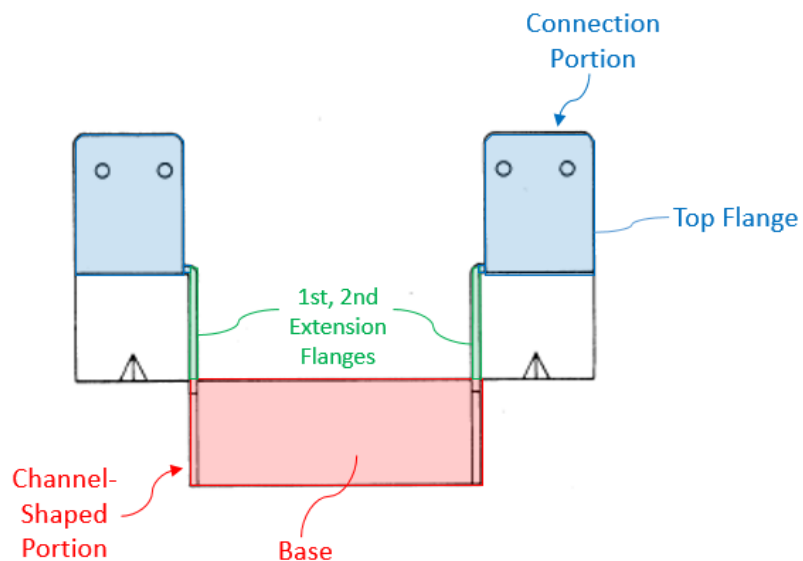
EX1041, Plan View (annotated).

E. Claims 10 and 63

For similar reasons as discussed for claims 9, 13, and 61-62, Yamaguchi discloses first and second extension flanges (green) that are flat elements made of sheet metal, and thus generally planar. EX1003, ¶¶115-116; EX1041, 2-5.



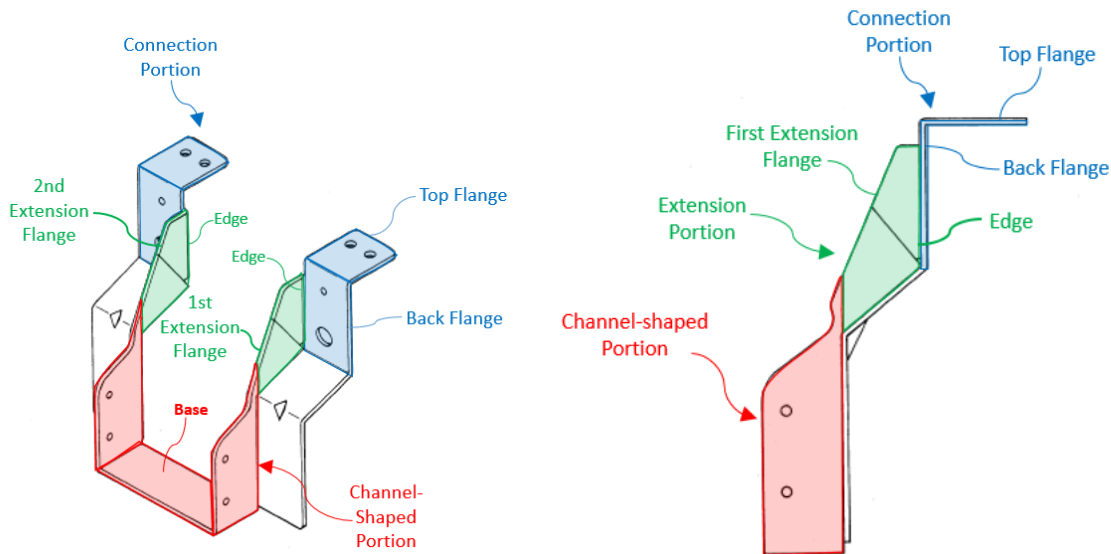
EX1041, Perspective, Front Views (annotated).



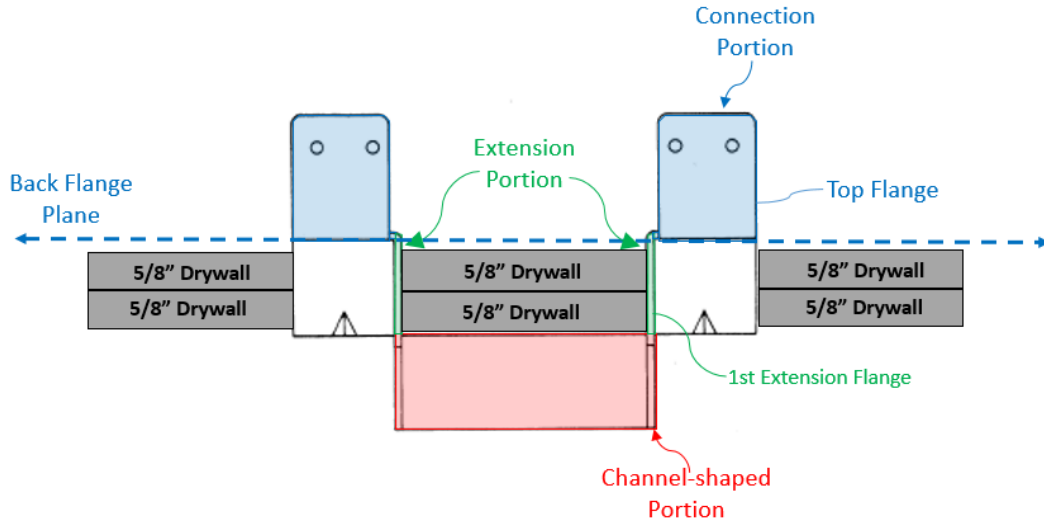
EX1041, Plan View (annotated).

F. Claims 11 and 64

Yamaguchi discloses first and second extension flanges (green) each including an edge (i.e., where each extension flange joins its respective back flange), as shown below. EX1041, 2–5; EX1003, ¶117. When the teachings of Bundy are combined with Yamaguchi’s hanger as discussed in §V.A., the resulting first and second extension flanges (green) each have a length sufficient to accommodate two layers of 5/8-inch-thick drywall and extend edgewise through the drywall when two layers of 5/8-inch-thick drywall are installed between the resulting hanger’s channel-shaped portion and back flange. EX1003, ¶¶117-118.



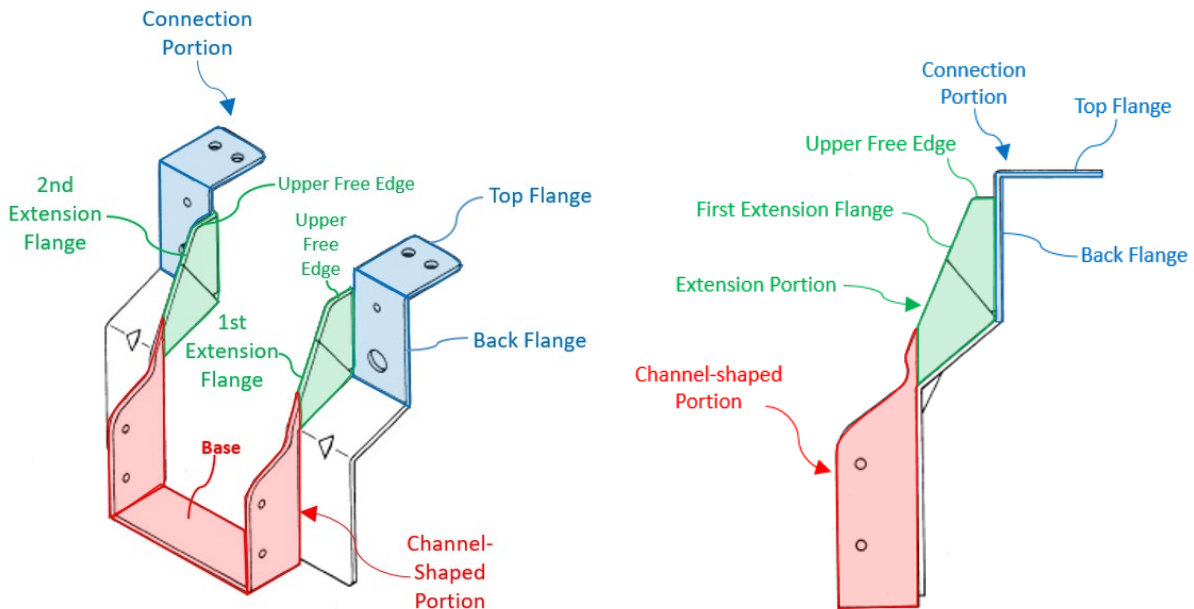
EX1041, Perspective, Side Views (annotated).



EX1041, Plan View (annotated).

G. Claims 12 and 65

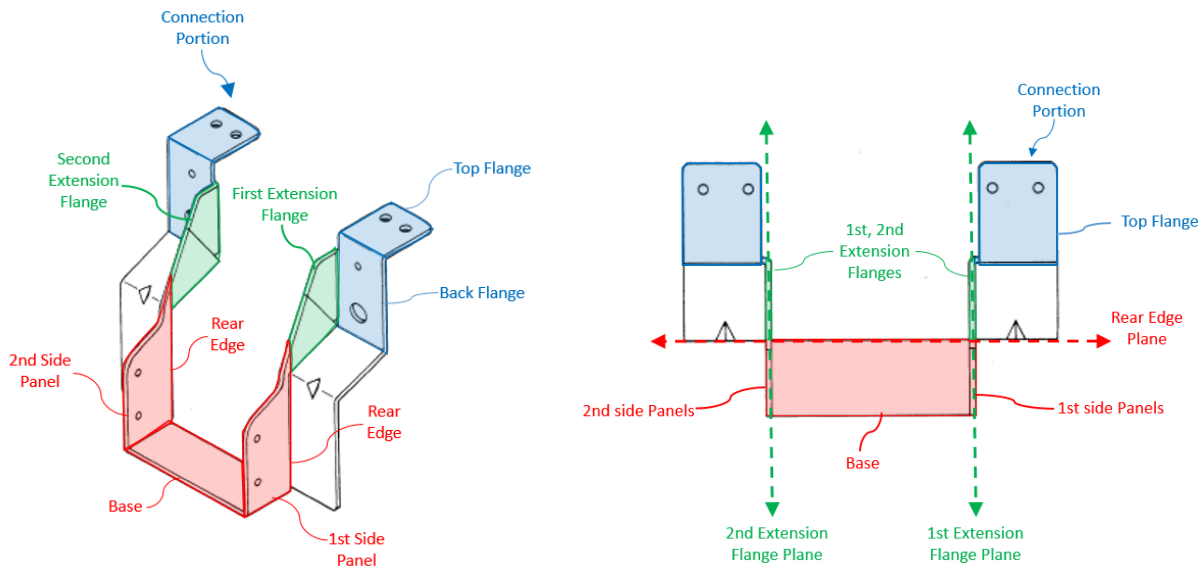
Yamaguchi discloses first and second extension flanges (green) each including an upper free edge, as shown below. EX1041, 2–5; EX1003, ¶¶119-120.



EX1041, Perspective, Side Views (annotated).

H. Claims 14 and 66

Yamaguchi discloses that the channel-shaped portion includes first and second side panels (red, annotated below) extending upward from the base (red). EX1041, 2–5; EX1003, ¶121. Each side panel has a vertical rear edge, the two edges defining (and thus lying in) a rear edge plane. As the side panels are vertical and symmetrical, having symmetrical spacing between the back flange and the vertical rear edges, the rear edge plane is perpendicular to the first and second extension flanges and extension flange planes, as shown below. EX1041, 2–5; EX1003, ¶¶121–122.

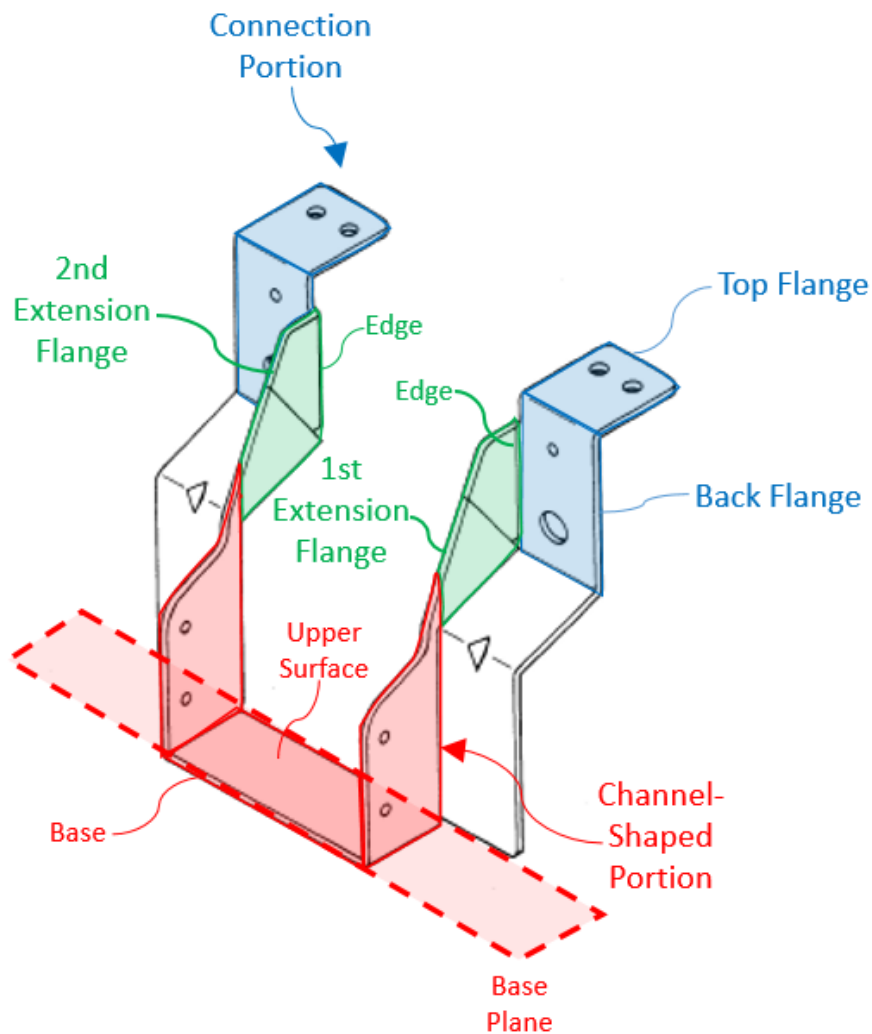


EX1041, Perspective, Plan Views (annotated)

I. Claims 21 and 73

As discussed with respect to claims 9 and 61, Yamaguchi discloses the channel-shaped portion (red) including a base (annotated below) configured to receive and support a structural component's end portion and having an upper surface arranged to engage the structural component and lying in a base plane.

EX1003, ¶123.

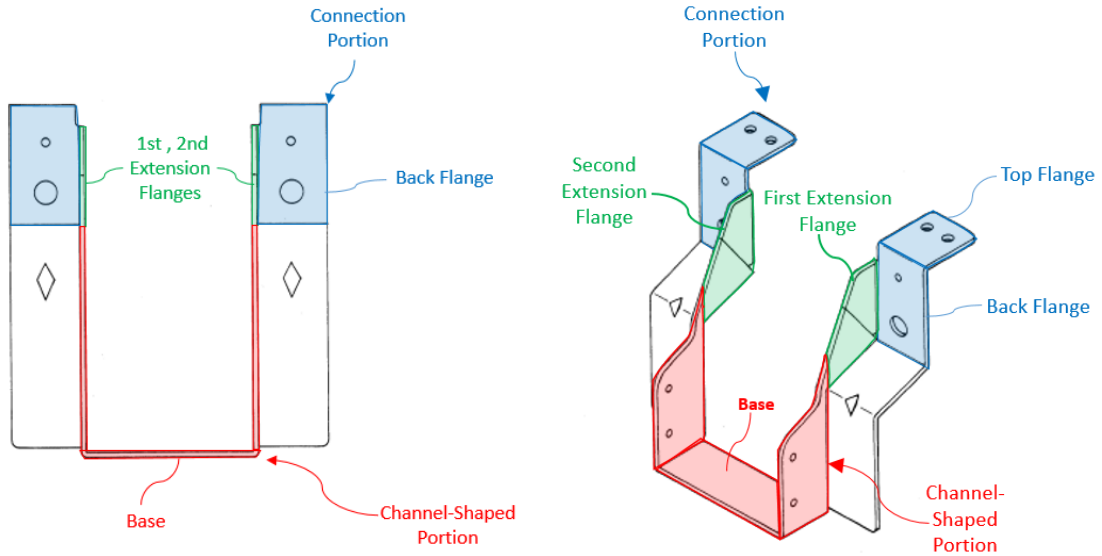


EX1041, Perspective View (annotated).

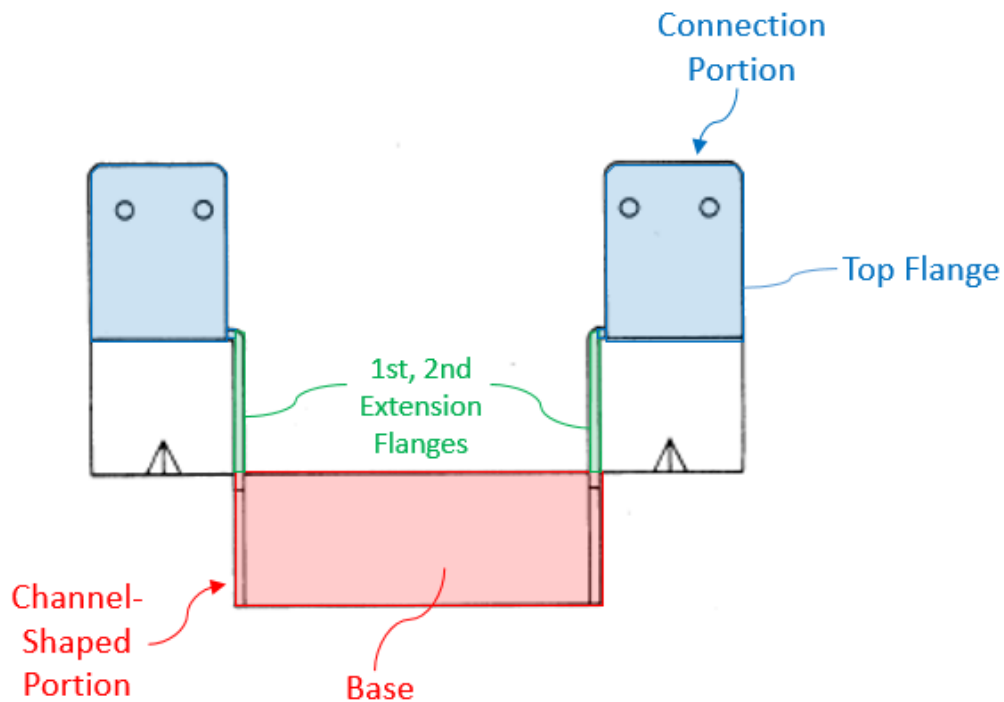
As discussed for claims 9, 13, and 61-62, Yamaguchi discloses the extension portion including both a first extension flange and a second extension flange (green). Yamaguchi discloses that each of the first and second extension flanges includes an edge (annotated above). There are no intervening components between the channel-shaped portion (red) and each extension flange, so each of the first and second extension flanges (green) extends edgewise from the channel-shaped portion (red) toward its respective back flange (blue) and the back flange plane in an extension direction that is parallel to the base plane (i.e., horizontal), as shown above. EX1041, 2–4; EX1003, ¶¶123-124.

J. Claims 29 and 81

As discussed above with respect to claims 9, 13, and 61–62, Yamaguchi discloses first and second extension flanges (green) extending from the connection portion (blue) to the channel-shaped portion (red) (and vice-versa, as recited in claim 81) and being parallel to one another. EX1041, 2–5; EX1003, ¶¶125-126.



EX1041, Perspective, Front Views (annotated).

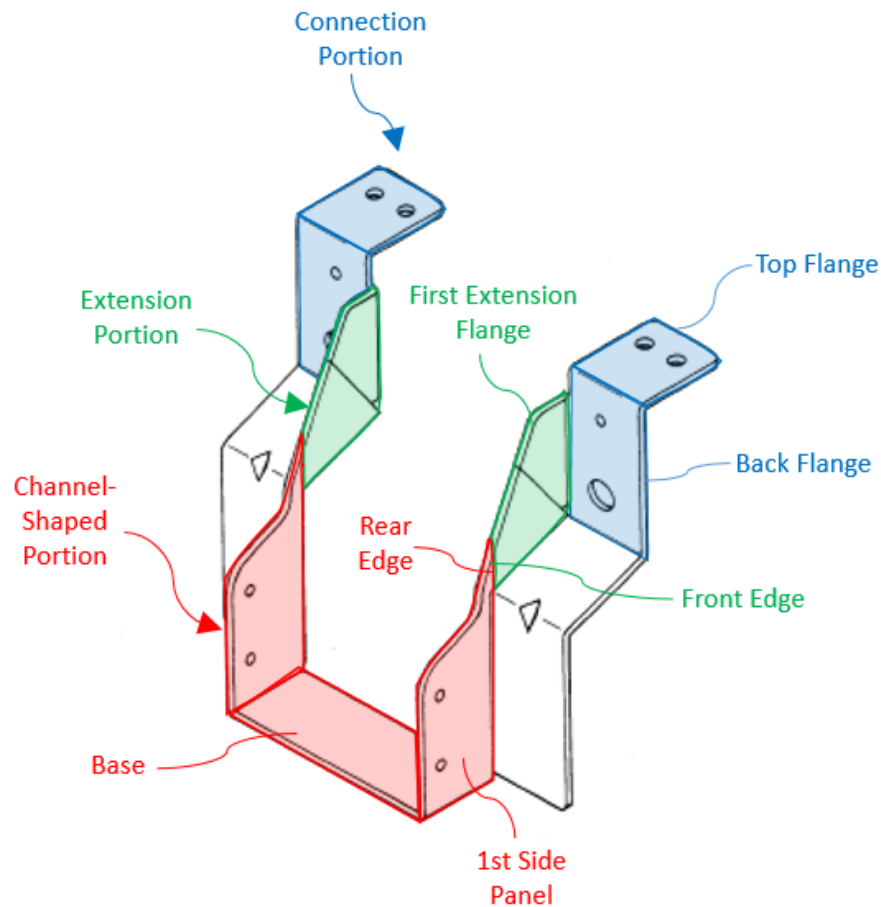


EX1041, Plan View (annotated).

K. Claims 30 and 82

As discussed for claims 9, 13, and 61-62, Yamaguchi discloses that its extension portion (green) includes a first extension flange (annotated below)

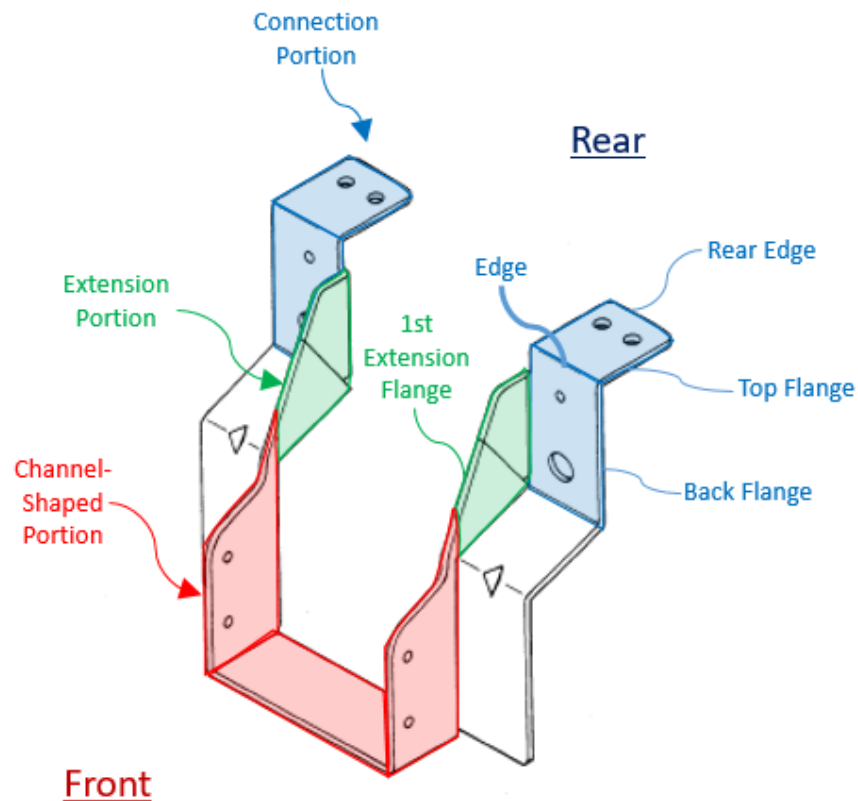
extending from the channel-shaped portion (red) toward the connection portion (blue) (and vice-versa). As discussed for claims 9, 14, 61, and 66, Yamaguchi discloses that the channel-shaped portion (red) includes a base (annotated below) configured to receive and support the structural component's end portion and a first side panel (annotated below) extending upward from the base. Yamaguchi further discloses a front edge of the first extension flange (annotated below) abutting a rear edge of the first side panel (annotated below), as they join with no intervening structures therebetween. EX1041, 2-5; EX1003, ¶¶127-128.



EX1041, Perspective View (annotated).

L. Claims 32 and 84

Yamaguchi discloses that the top flange (blue) includes a rear edge (annotated below) located rearwardly of the edge (annotated below) of the top flange from which the back flange (blue) extends, the rear edge also located rearwardly of the back flange (annotated below). EX1003, ¶¶129-130.



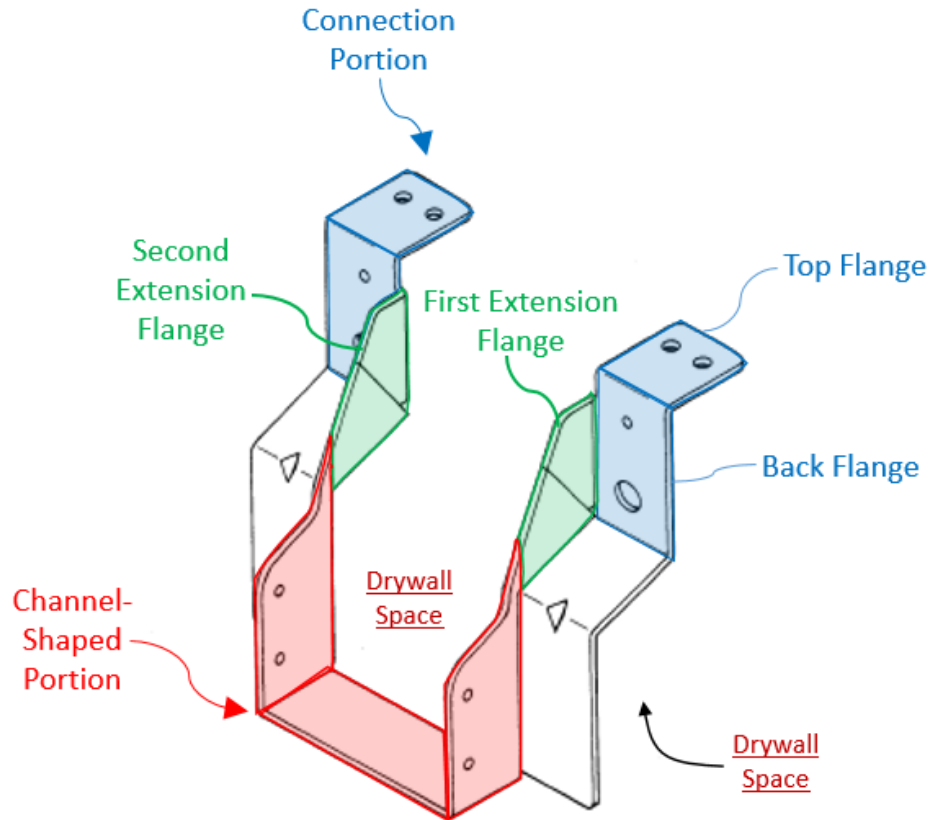
EX1041, Perspective View (annotated).

M. Claims 33-35 and 85-86

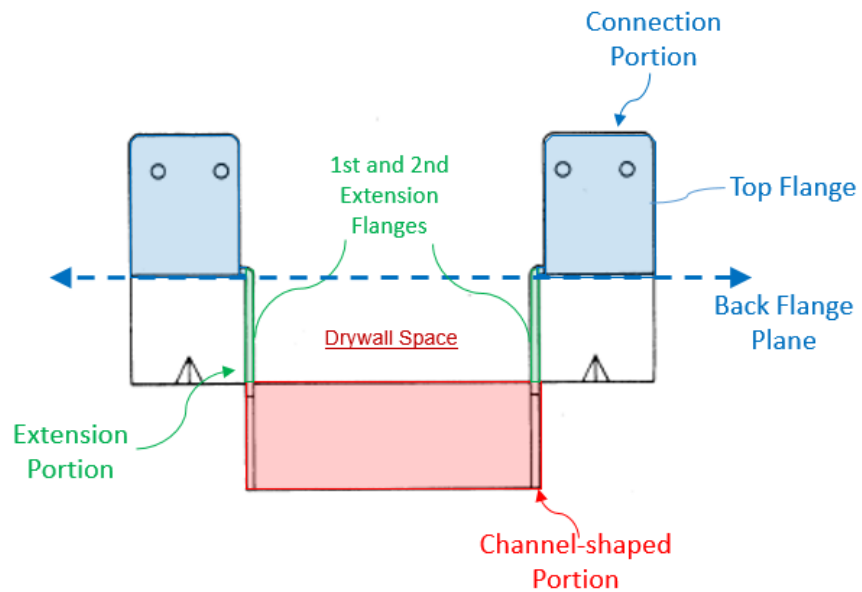
In employing the teachings of Bundy's drywall space with Yamaguchi's hanger, Yamaguchi-Bundy renders obvious a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein. EX1007, 5:10–22. As

discussed for claims 9, 13, 61, and 62, Yamaguchi discloses that the extension portion (green) includes a first extension flange (annotated below) and a second extension flange (annotated below) extending from the connection portion (blue) to the channel-shaped portion (red). EX1041, 2–5; EX1003, ¶131.

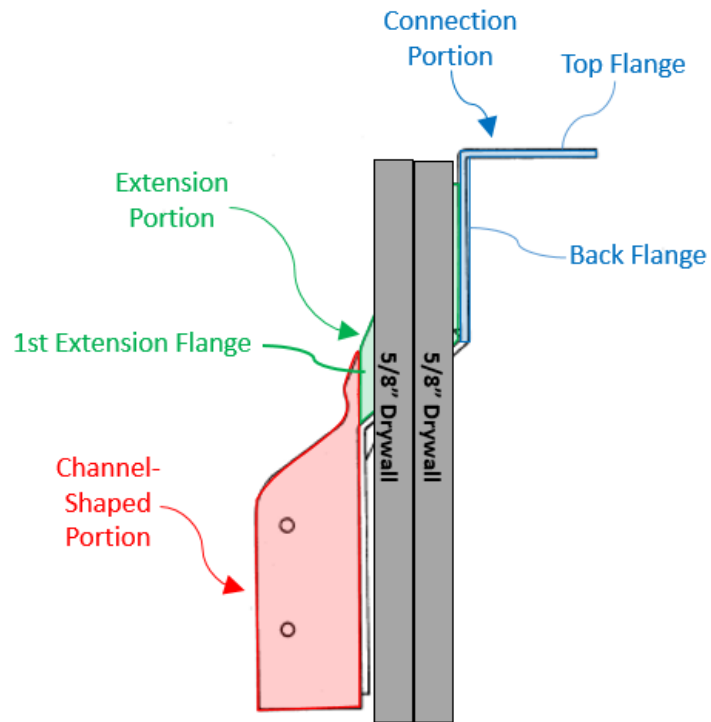
For the reasons discussed for claims 1 and 53, and in §V.A., a POSITA would have sought to modify the length of Yamaguchi's extension flanges as taught by Bundy. This modification would have resulted in a drywall space sized and shaped to receive two layers of 5/8-inch-thick drywall between Yamaguchi's channel-shaped portion (red) and back flange (blue). As the channel-shaped portion (red) and back flange plane (defined by the back flange (blue)) of the Yamaguchi-Bundy combination define the drywall space's size and shape, they bound the drywall space. EX1041, 2–5; EX1007, 5:10-22; EX1003, ¶¶132-133. Because the first and second extension flanges of the Yamaguchi-Bundy combination further define the drywall space's size and shape, they also each bound the drywall space. *Id.*



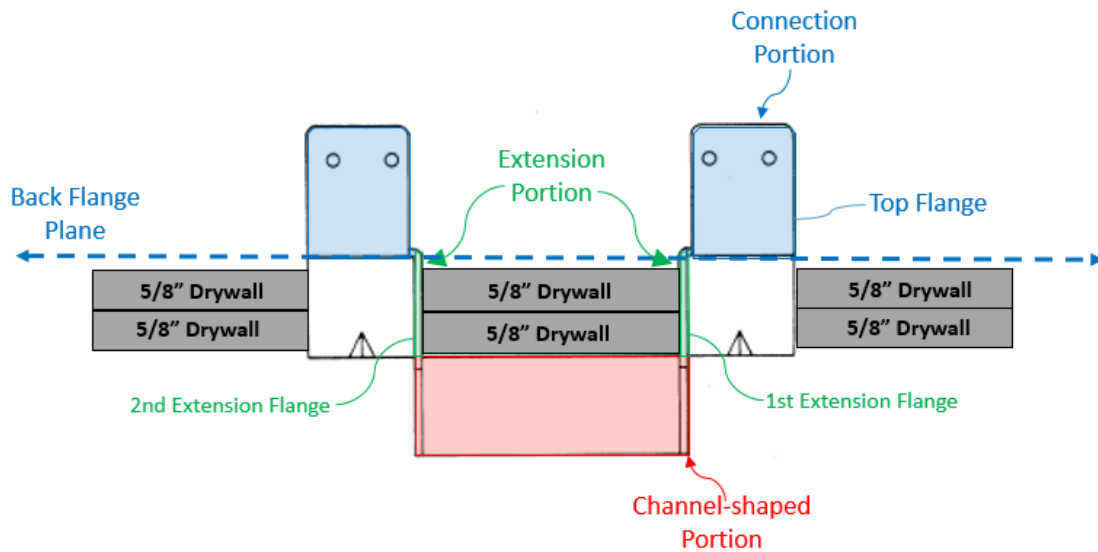
EX1041, Perspective View (annotated).



EX1041, Plan View (annotated).



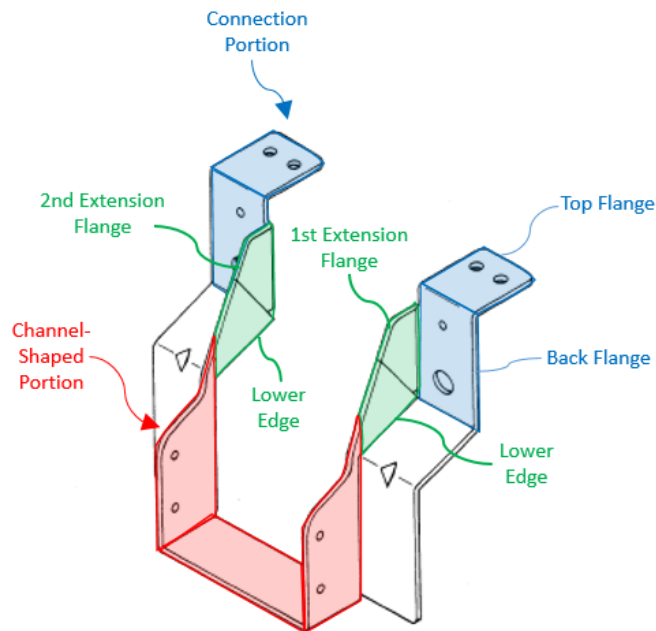
EX1041, Side View (annotated).



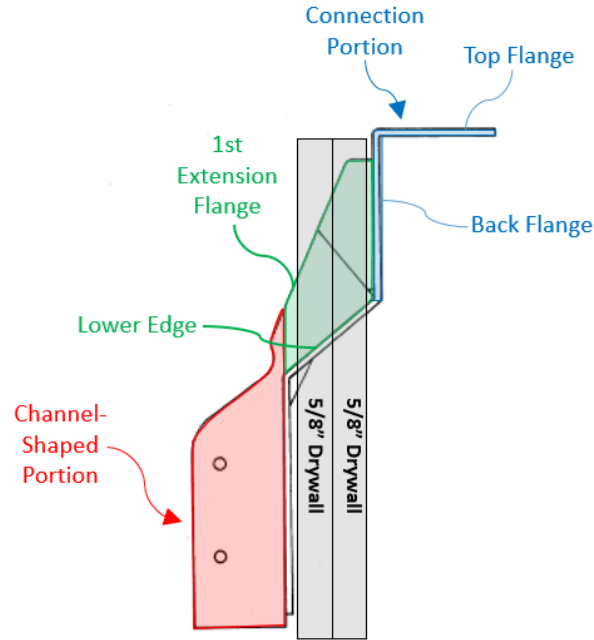
EX1041, Plan View (annotated).

N. Claims 87 and 88

Yamaguchi discloses that the first and second extension flanges (green) include a lower edge (annotated below). EX1041, 2–5; EX1003, ¶134. In employing the teachings of Bundy’s drywall space with Yamaguchi’s hanger as discussed for claims 85-86, the lower edge (annotated below) of the first and second extension flanges (green) and the back flange (blue) of the Yamaguchi-Bundy combination each further define the drywall space’s size and shape, and thus bound the drywall space. EX1041, 2–5; EX1007, 5:10-22; EX1003, ¶¶134-135.



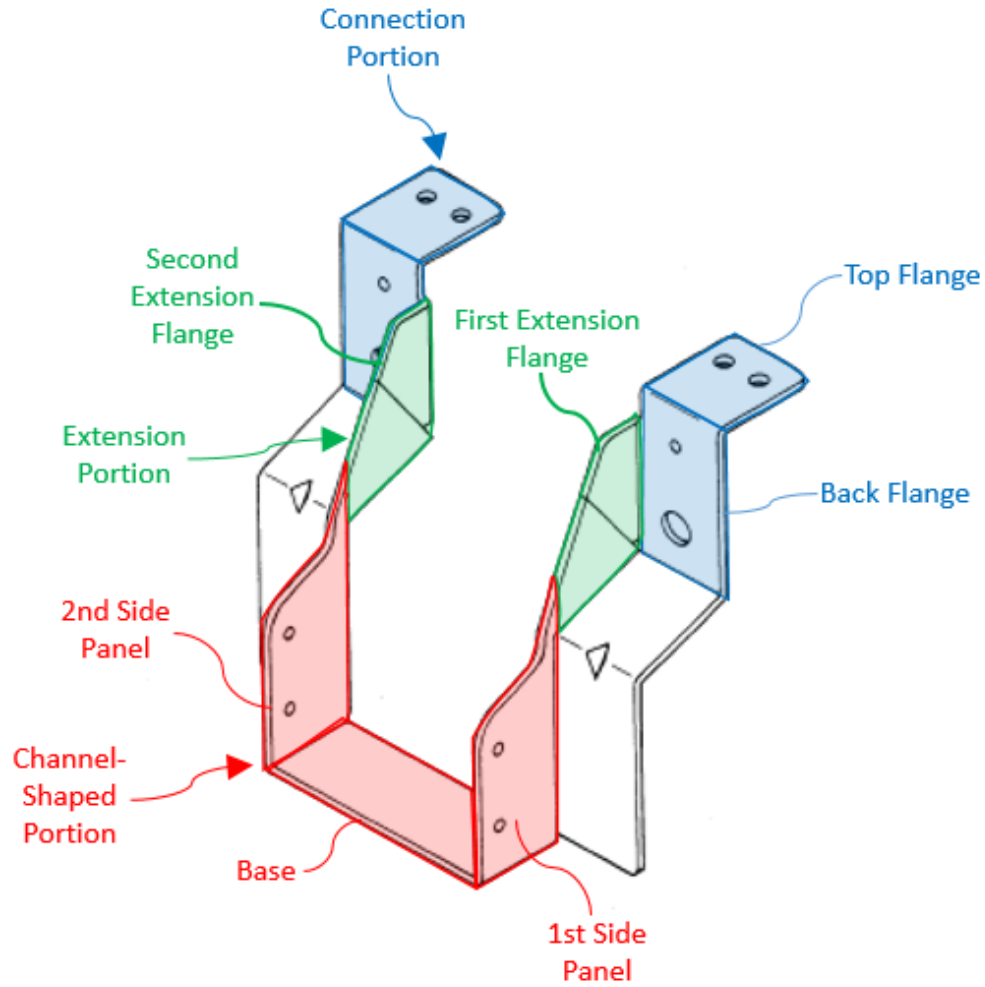
EX1041, Perspective View (annotated)



EX1041, Side View (annotated).

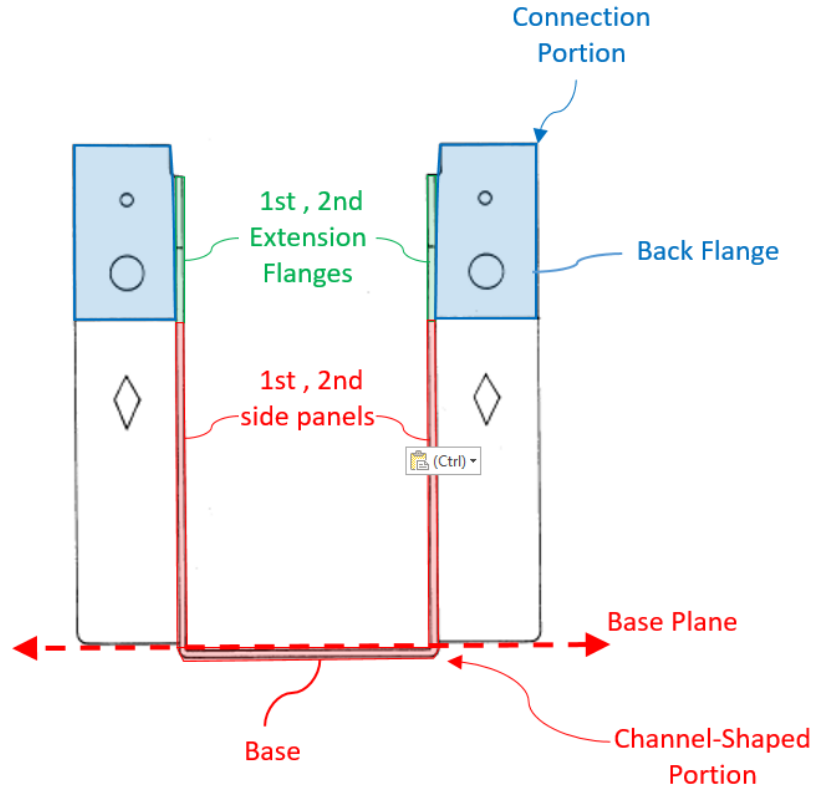
O. Claims 36 and 89

As discussed for claims 9, 13, and 61-62, Yamaguchi discloses: the channel-shaped portion (red) including a base (annotated below) configured to receive and support the structural component's end portion; the extension portion (green) including a first and second extension flanges (annotated below) extending from the connection portion (blue) to the channel-shaped portion (red) (and vice-versa, as recited in claim 89); and the first and second extension flanges (annotated below) being parallel to each other. As discussed for claims 14 and 66, Yamaguchi discloses the first and second side panels extending upward from the base (annotated below). EX1003, ¶136.



EX1041, Perspective View (annotated).

Yamaguchi further discloses each side panel (red, annotated below) being co-planar with its respective extension flange (green, annotated below), as they share the same vertical orientation. EX1041, 2–5; EX1003, ¶¶137-138.

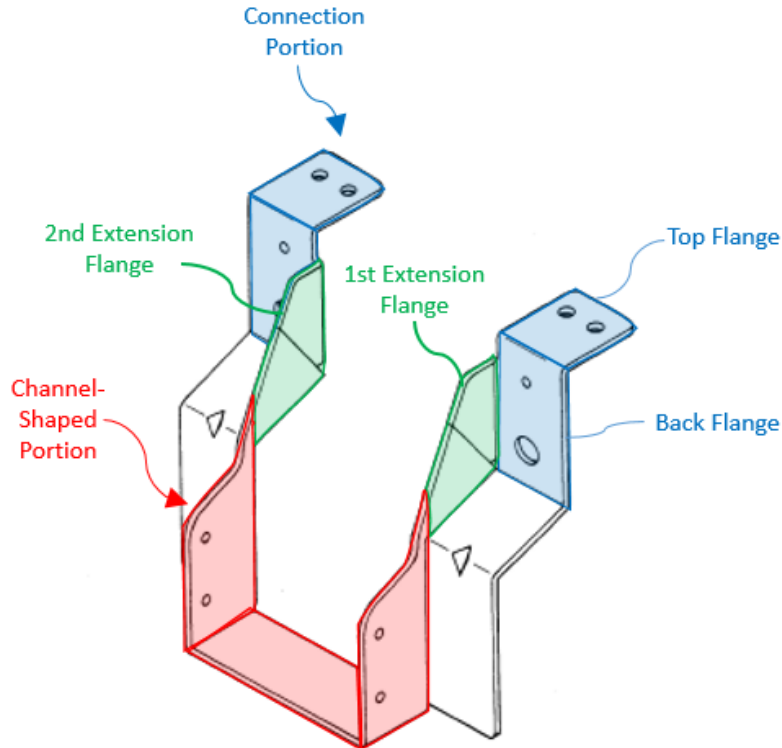


EX1041, Front View (annotated).

As the first and second extension flanges are parallel to each other, and the first and second side panels are respectively co-planar therewith, Yamaguchi discloses the first and second extension flanges and the first and second side panels are all parallel to each other, as shown above. EX1041, 2-5; EX1003, ¶¶138-139.

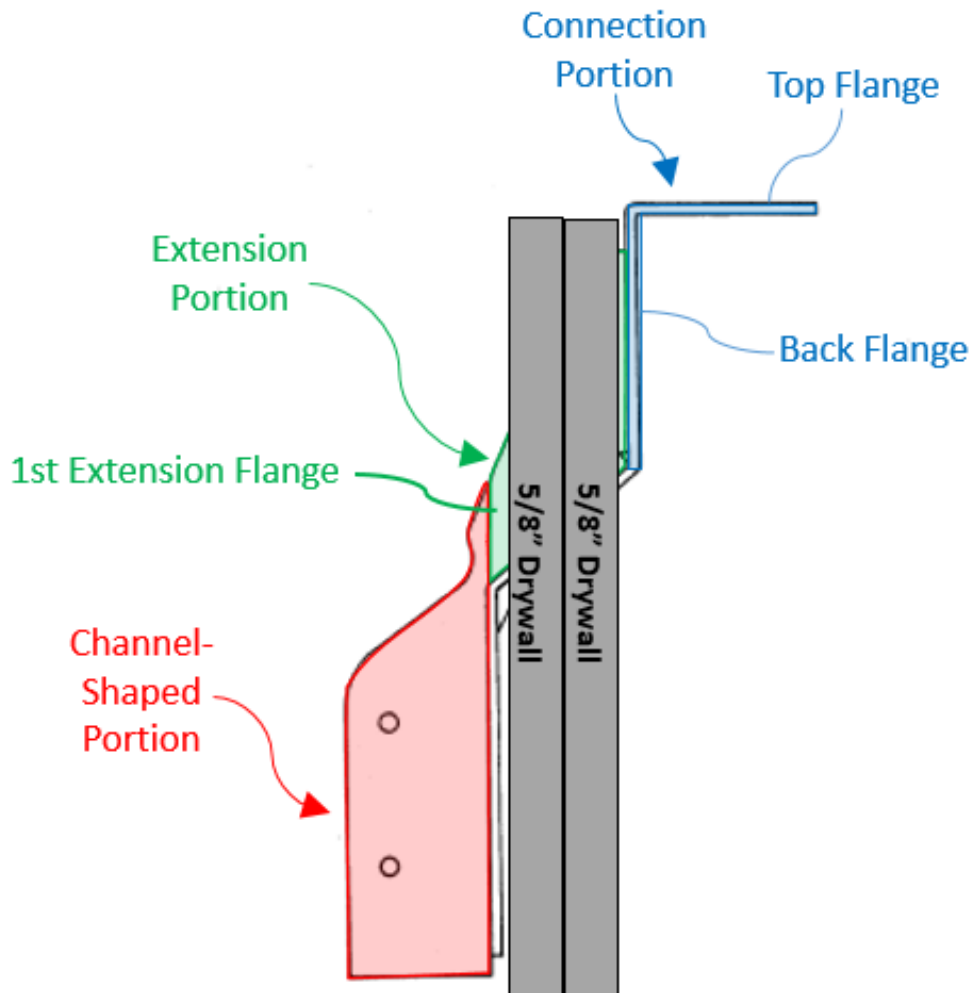
P. Claims 38 and 91

As discussed for claims 9, 13, 61, and 62, Yamaguchi discloses the extension portion including first and second extension flanges (green-vertical portions) extending from the connection portion (red) to the channel-shaped portion (blue) (and vice-versa, as recited in claim 91).



EX1041, Perspective View (annotated).

Further, because Yamaguchi's extension flanges are in an opposed, face-to-face relation and are symmetrical to each other across a juncture like the extension flanges shown in Figure 7 of the '626 patent, Yamaguchi discloses the first and second extension flanges engaging each other along a juncture, as the term "engage" used in the '626 patent (EX1001, Abstract). EX1003, ¶¶140-141. In combining the teachings of Bundy's use of drywall in the Yamaguchi-Bundy combination, the juncture of the resulting extension flanges (vertical-green) would be positioned within the two layers of 5/8-inch-thick drywall. *Id.*



EX1041, Side View (annotated).

VI. CLAIMS 15, 31, 37, 67, 83, AND 90 WOULD HAVE BEEN OBVIOUS OVER YAMAGUCHI IN VIEW OF BUNDY, FURTHER IN VIEW OF GILB'416.

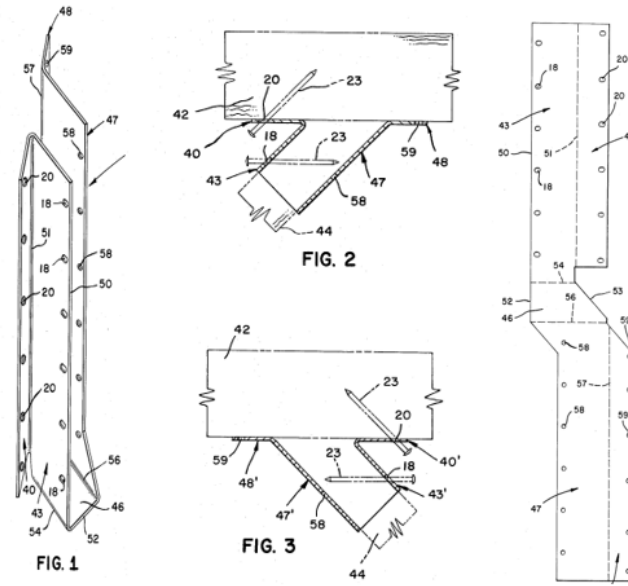
Each element of independent claims 1 and 53 is described above in §V with respect to Yamaguchi in view of Bundy. However, neither Yamaguchi nor Bundy appear to show how the hanger would mount a structural member at a non-orthogonal angle with respect to the wall. For the following reasons, claims 15,

31, 37, 67, 83, and 90 would have been obvious over Yamaguchi in view of Bundy, further in view of Gilb'416. EX1003, ¶¶143-144.

A. Motivation to Combine Yamaguchi, Bundy, and Gilb'416.

Bending a hanger to orient its channel-shaped portion so as to mount a structural member at a non-orthogonal angle with respect to the wall⁵ was well-known, as evidenced by Gilb'416. EX1003, ¶145. Gilb'416 discloses a metal connector (i.e., a hanger) for “joining wood members which intersect at an angle less than 90 degrees,” as shown below. EX1011, Abstract; 3:31–4:19.

⁵ The '626 patent uses “skewed” and “non-orthogonal” interchangeably: “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.” EX1001, 8:30-34.



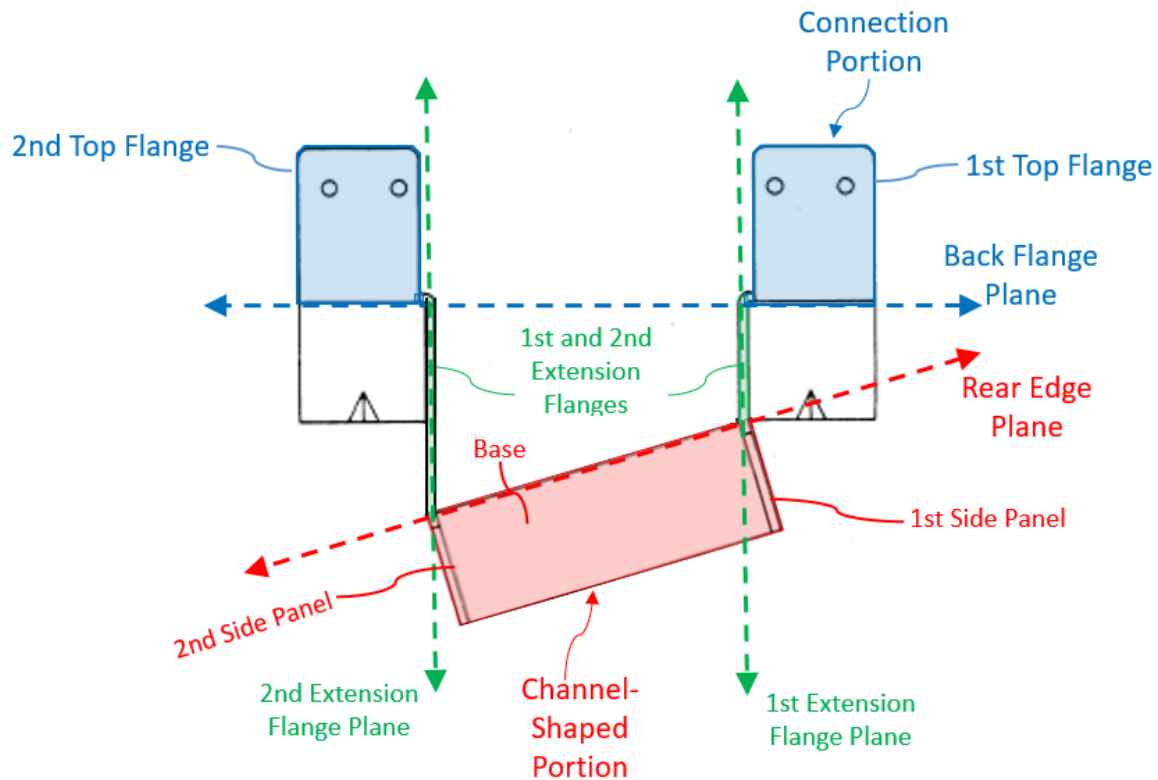
EX1011, FIGS. 1–4.

Gilb’416’s hanger includes a channel-shaped portion having “a seat member 46 which is connected to the first side member [43] and a second side member 47 positioned parallel to the first side member [43].” EX1011, 3:39–42. Gilb’416’s hanger includes “[a] first face member [40] ... adapted for nailing to a supporting member 42” and a “second face member 48 [that] is connected to the second side member [47] and is positioned parallel to the first face member [40].” EX1011, 3:31–44. To make its hanger “skewed,” Gilb’416 teaches that “the first face member [40] is bent up 135 degrees along said first side bend line 51,” which “defines a border” between first side member 43 and first face member 40, and that “the second face member 48 is bent up 45 degrees along the second side bend line 57,” which “defines a border” between the second side member 47 and the second face member 48. EX1011, 3:45–66, 4:11–19; EX1003, ¶146.

Gilb'416 recognizes that framing members are often designed to intersect at a 45° angle and many connectors are designed with a 45° angle. EX1003, ¶147; EX1011, 3:10-14 . Accordingly, a POSITA would have been motivated to modify the Yamaguchi-Bundy hanger via bending such that the channel-shaped portion would be disposed at a non-orthogonal angle relative to the wall, so as to mount a skewed structural component, as taught by Gilb'416. EX1003, ¶147. Given that angling a framing connector was well-known, a POSITA would have had a reasonable expectation of success in such a modification, as it would have been nothing more than using a known technique (bending the connection between two metal structural portions at an angle as shown in Gilb'416) to improve similar devices (Yamaguchi's hanger as modified by Bundy) in the same way. EX1003, ¶147.

B. Claims 15 and 67

As discussed for claims 14 and 66, Yamaguchi discloses that the channel-shaped portion includes first and second side panels extending upward from the base, each side panel having a rear edge, the rear edges lying in a rear edge plane. EX1040, FIG. 2; EX1003, ¶148.



EX1041, Pan View (rendering).

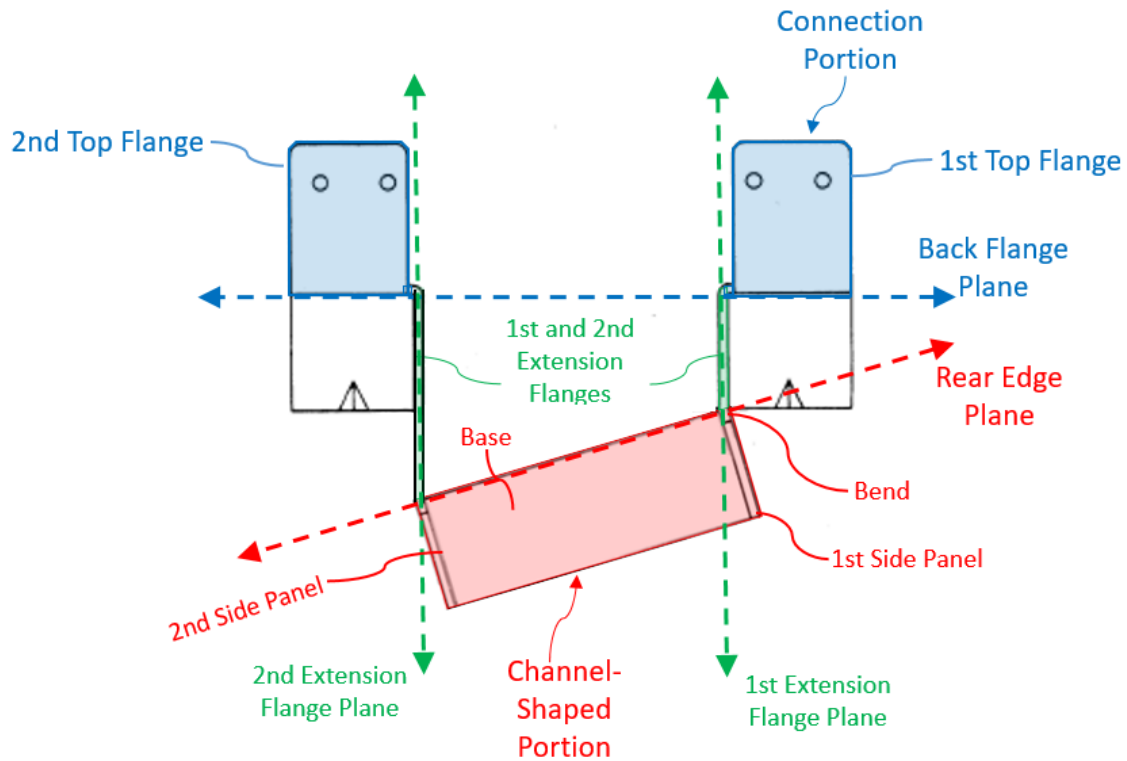
While the figures in Yamaguchi do not show its first and second side panels (whose rear edges define the rear edge plane) being skewed, it would have been obvious to modify the Yamaguchi-Bundy hanger as taught by Gilb'416 to skew the first and second side panels such that the rear edge plane is oriented at a skewed angle to the first and second extension flanges and extension flange planes. Specifically, a POSITA would have sought to extend one of Yamaguchi-Bundy's extension flanges further away from the back flange, as shown above, to receive the joist at a sharper angle while maintaining the Yamaguchi-Bundy drywall space. EX1003, ¶149. Doing so was well within the level of ordinary skill

in the art. *See* EX1043, FIGS. 4–5; EX1044, FIG. 9; EX1045, 2; EX1003, ¶¶149–150.

C. Claims 31 and 83

For the reasons discussed for claims 30 and 82, Yamaguchi-Bundy discloses the front edge of the first extension flange being directly attached to and abutting the rear edge of the first side panel. Yamaguchi's figures do not show a bend at such abutment.

As discussed in §VI.A, a POSITA would have found it obvious to bend the Yamaguchi-Bundy hanger so the channel-shaped portion would hold a structural member at a skewed angle from the wall as taught by Gilb'416. A POSITA would have understood to bend Yamaguchi-Bundy's hanger as taught by Gilb'416 somewhere between the connection portion and the channel-shaped portion to maintain secure connection with the wall and structural member, respectively. EX1003, ¶151. To reduce the complexity in cutting drywall for installation between the non-orthogonal channel-shaped portion and connection portion, a POSITA would have kept the extension flanges of the Yamaguchi-Bundy-Gilb'416 hanger orthogonal to the wall. *Id.* A POSITA would thus have added a bend to the hanger where the front edge of the first extension flange abuts the rear edge of the first side panel, on the other side of Yamaguchi-Bundy's drywall space from the wall, as shown below. *Id.*, ¶¶151-152.



EX1041, Plan View (rendering).

D. Claims 37 and 90

As discussed in §VI.A, a POSITA would have found it obvious to bend the Yamaguchi-Bundy hanger so the channel-shaped portion would hold a structural component at a non-orthogonal angle from the wall as taught by Gilb'416. As the connection portion connects to the wall, and the channel-shaped portion supports the structural member, a POSITA would have understood to arrange Yamaguchi-Bundy's channel-shaped portion with respect to the connection portion so as to

mount the structural component at a non-orthogonal angle relative to the frame wall given the Yamaguchi-Bundy-Gilb'416 combination. EX1003, ¶¶153-154.

VII. CLAIMS 1, 9–15, 21, 29–38, 53, 61–67, 73, AND 81–91 WOULD HAVE BEEN OBVIOUS OVER CULLEN IN VIEW OF BUNDY.

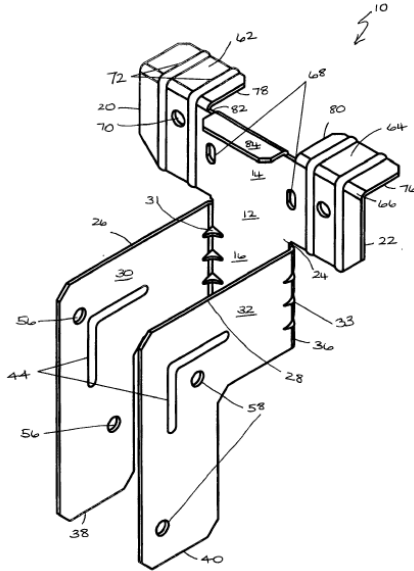
Cullen, as modified in view of Bundy, renders obvious claims 1, 9–15, 21, 29–38, 53, 61–67, 73, and 81–91 for the following reasons.

Cullen discloses each and every structural element listed in independent claims 1 and 53 but does not explicitly disclose that the space defined between its channel-shaped portion and back plate is sized large enough to receive two layers of 5/8-inch-thick drywall therein. However, Bundy discloses an analogous firewall hanger that receives two layers of 5/8-inch-thick drywall between its channel-shaped portion and the wall frame. EX1003, ¶¶155-156. A POSITA would have sought to combine the teachings of Bundy with Cullen's hanger to define a space large enough for receiving two layers of 5/8-inch-thick drywall with a reasonable expectation of success, as explained below.

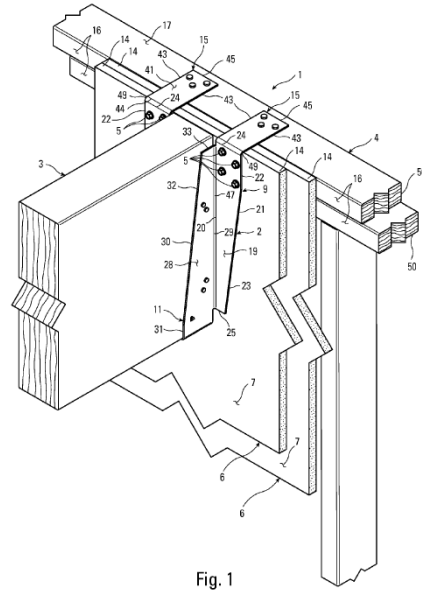
A. Motivation to Modify Cullen Based on the Teachings of Bundy.

Cullen and Bundy are both directed to joist hangers. EX1003, ¶¶61–71, 157. Cullen's hanger 10 defines a space between its back plate 12 and channel-shaped portion (which includes legs 38, 40 and an optional seat) corresponding to the length of its extension portion (sidewalls 30, 32). *Id.* Bundy discloses sizing an extension portion of an analogous hanger to receive two 5/8"-thick-layers of

drywall between its channel-shaped portion (seat member 12) and the front face 6 of the wall's support member 4. *Id.*, ¶157; EX1007, 5:16-18. Two 5/8" thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶¶157-158.



EX1039, FIG. 1;



EX1007, FIG. 1.

Given that Cullen's hanger is intended broadly for "timber building construction," not just "decking," as taught by Bundy a POSITA would have sought to use Cullen's hanger 10 to secure a joist to a wooden frame wall—joist hangers used in these applications often include a space between the end of a joist and the wall for a number of reasons, including to receive drywall, as evidenced by Bundy. EX1039, 1:4, 5:7–8; EX1007, 2:10–24, 5:10–20; EX1003, ¶159. Bundy teaches receiving drywall between a hanger's channel-shaped portion and the front surface of a top plate to shield a frame wall, and discloses advantages for accommodating two layers of 5/8" drywall between a wall frame and a structural

member held by a hanger for fire resistance in a fire separation wall. EX1007, 2:10–24, 5:10–20. EX1003, ¶¶159-160. Accordingly, a POSITA would have been motivated to receive drywall between Cullen’s back plate and legs when using Cullen’s hanger for “timber building construction.” EX1039, 1:4, 5:7–8; EX1003, ¶¶159-161. Specifically, a POSITA would have optimized the size of the spacing between Cullen’s back plate and legs (i.e., the length of its sidewalls) to accommodate two layers of 5/8” thick drywall according to the size preference described by Bundy for optimal fire protection and wall integrity. EX1003, ¶¶159-161; EX1007, 5:10-22. This modification to Cullen would have been nothing more than applying a known technique (Bundy’s spacing a hanger seat from a wall frame by a distance sufficient to accommodate two 5/8” drywall sheets for fire resistance) to a similar device (Cullen’s hanger having sidewalls of indeterminate length) to obtain the predictable result of a firewall hanger having sidewalls long enough to space a channel-shaped portion from a wall frame for receiving fire-resistant drywall therebetween, thereby “protect[ing] the structural members of a building.” EX1007, 5:18-20; EX1003, ¶160.

A POSITA would have had an expectation of success in modifying Cullen’s hanger 10 to include a space large enough to receive two layers of 5/8”-thick drywall between its back plate 12 and legs 38, 40 because doing so would still allow Cullen’s hanger to perform its intended function of securing a joist to a wall.

EX1039, 5:7–8; EX1003, ¶161. Recognizing that Cullen’s and Bundy’s hangers are constructed from sheet metal blanks, a POSITA would have understood how to modify the size of Cullen’s legs 38, 40 to accommodate two layers of 5/8” drywall while still allowing Cullen’s hanger to secure a joist’s end to a frame wall.

EX1003, ¶162; EX1007, 4:47-51; EX1039, 3:1–11. A POSITA would have also understood to adjust the length of Cullen’s location tab 84 to extend across two layers of 5/8” drywall to ensure that the joist’s top surface is “coplanar” with the top plate’s upper surface. EX1003, ¶¶162-163; EX1039, 12:20–13:5. Doing so would have been well within the level of ordinary skill in the art. EX1003, ¶¶162-163.

B. Independent Claim 1

[1.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

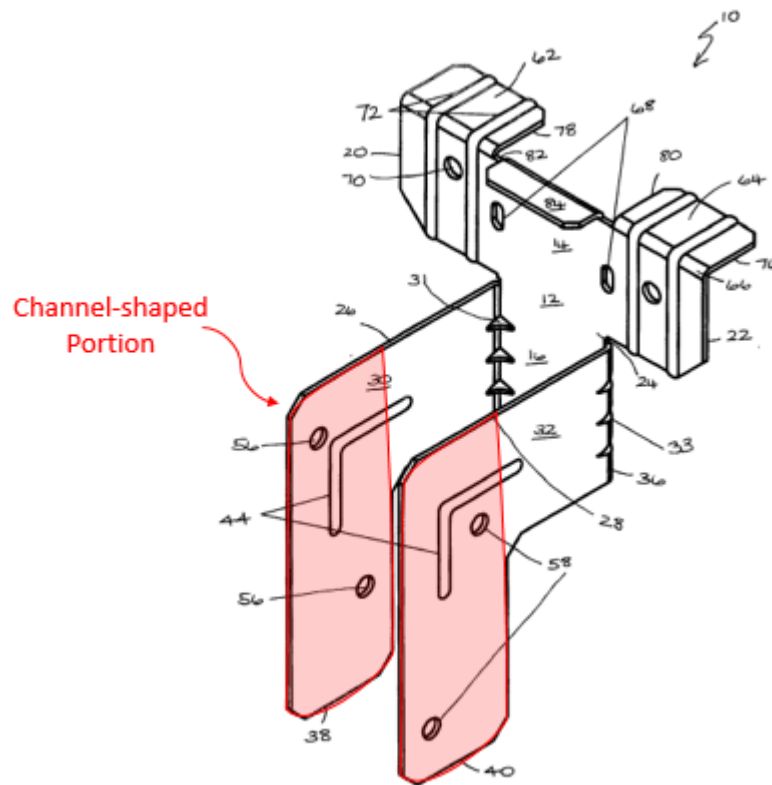
As discussed above for Yamaguchi, the preamble of claim 1 is not limiting because the patentee recites a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use. EX1003, ¶164.

To the extent that the preamble is limiting, the Cullen-Bundy combination renders obvious such a hanger. EX1003, ¶¶165–167. Cullen discloses using hanger 10 for timber building construction, but not explicitly for a wall adapted to have two-layers of 5/8-inch-thick drywall mounted thereon. EX1039, 3:1–2. As

discussed above in §VII.A., a POSITA would have understood that Cullen's hanger would be applicable to a wall covered with two such layers of drywall for fire resistance, as taught by Bundy, and that Cullen's sidewalls would be sized to accommodate two such layers of drywall between its back flanges and channel-shaped portion. EX1003, ¶165; EX1007, 2:37-41. A POSITA would have also understood that Cullen's hanger is configured to secure to a top plate of a frame wall by connecting Cullen's hanger thereto. EX1003, ¶165. Accordingly, it would have been obvious to a POSITA to use Cullen's hanger as modified by Bundy to connect a structural component to a top plate of a frame wall adapted to have the requisite drywall mounted thereon. *Id.* Such a modification would have been simply applying a known technique (Bundy's use of a hanger on a frame wall with two layers of 5/8" drywall to create a fire separation wall) to a known device (Cullen's hanger having sidewalls of indeterminate length) to obtain the predictable result of optimizing the size of the hanger's spacing to receive two layers of 5/8" thick drywall therein, thereby shielding wall structures from fire. *Id.*; *see, e.g.*, EX1007, 5:18-19. A POSITA would have had an expectation of success in using Cullen's hanger with a drywall-covered wall because Bundy's and Cullen's hangers serve similar purposes—supporting a floor joist/structural beam at a top end of a wall. EX1003, ¶¶166-168.

[1.1] “a channel-shaped portion configured to receive the structural component,”

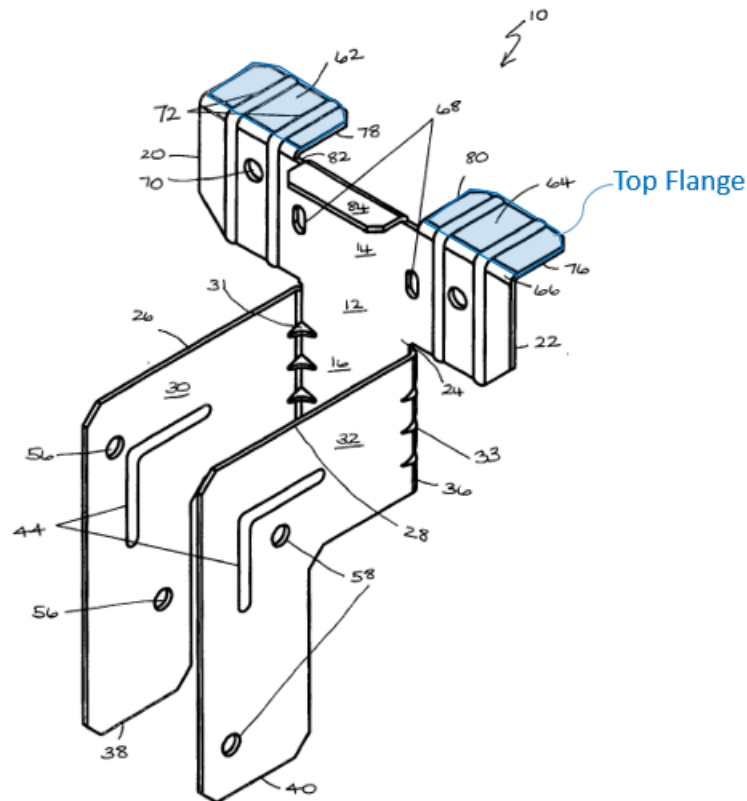
Cullen discloses a channel shaped portion (which includes legs 38, 40 and an optional seat) configured to receive the structural component (joist). EX1039, 10:29–11:1, 17:20–25. Cullen further discloses that “[t]he joist hanger may include a seat portion.” EX1039, 5:25, 7:20–22. EX1003, ¶¶169–170.



EX1039, FIG. 1 (annotated).

[1.2.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

Cullen discloses a connection portion that includes a top flange (bearing plates 62, 64) arranged to engage a top surface of a top plate of the frame wall, as suggested by Bundy. EX1039, 3:3–7, 11:24–29; EX1003, ¶¶171-172.

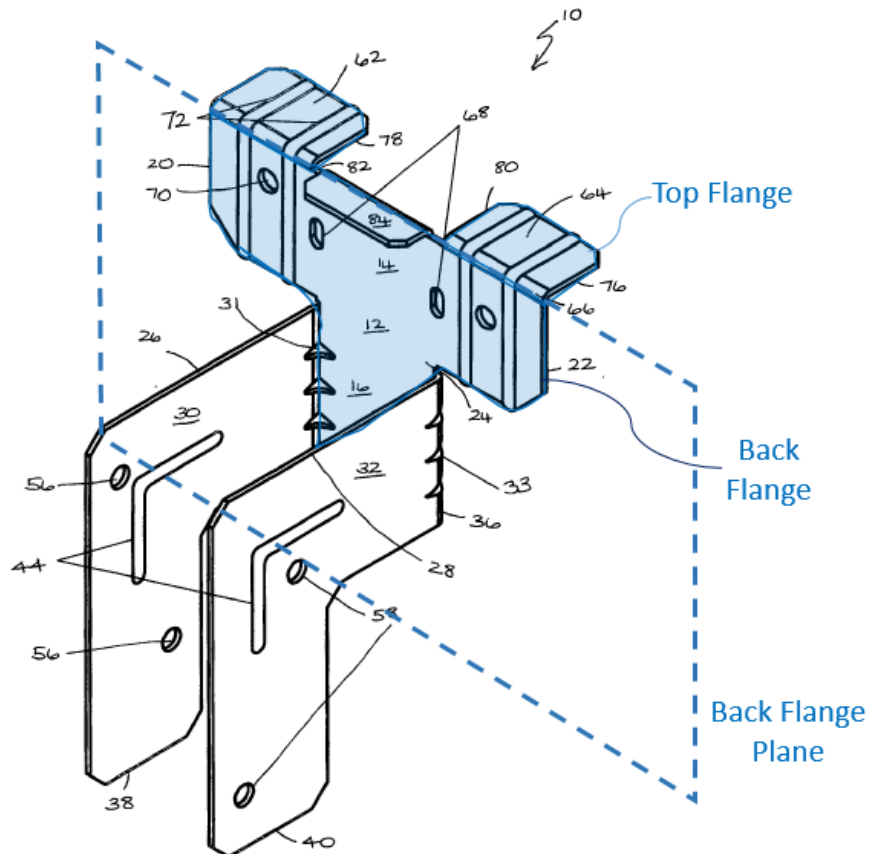


EX1039, FIG. 1 (annotated). EX1003, ¶101.

[1.2.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

Cullen discloses two back flanges (integral parts of back plate 12), each back flange (right-half of back plate 12, left-half of back plate 12) extending from an

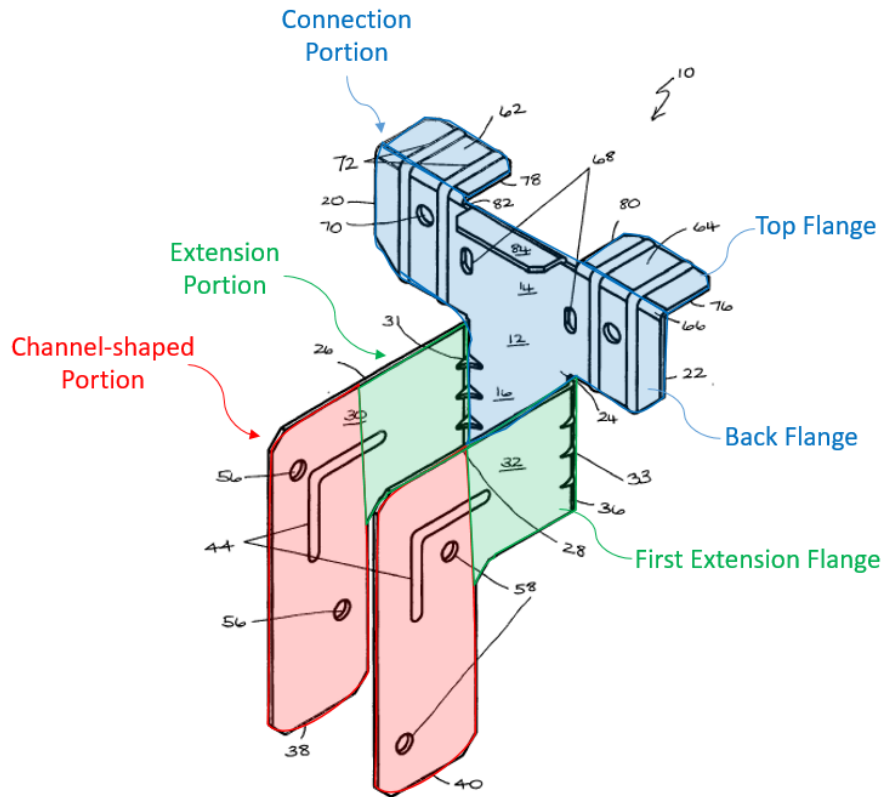
edge of a respective top flange (bearing plates 62, 64) and being arranged to engage a vertical face of the top plate of the frame wall, each back flange having a front surface lying in a back flange plane. EX1039, 10:16–22; EX1003, ¶¶173-174.



EX1039, FIG. 1 (annotated). EX1003, ¶103.

[1.3.A] “an extension portion including a first extension flange extending from the back flange of the connection portion to the channel-shaped portion;”

Cullen discloses an extension portion including a first extension flange (sidewall 32) extending from the back flange (which includes the right-half of back plate 12) to the channel-shaped portion (which includes legs 38, 40 and an optional seat). EX1039, 10:25–11:1; EX1003, ¶¶175-176.

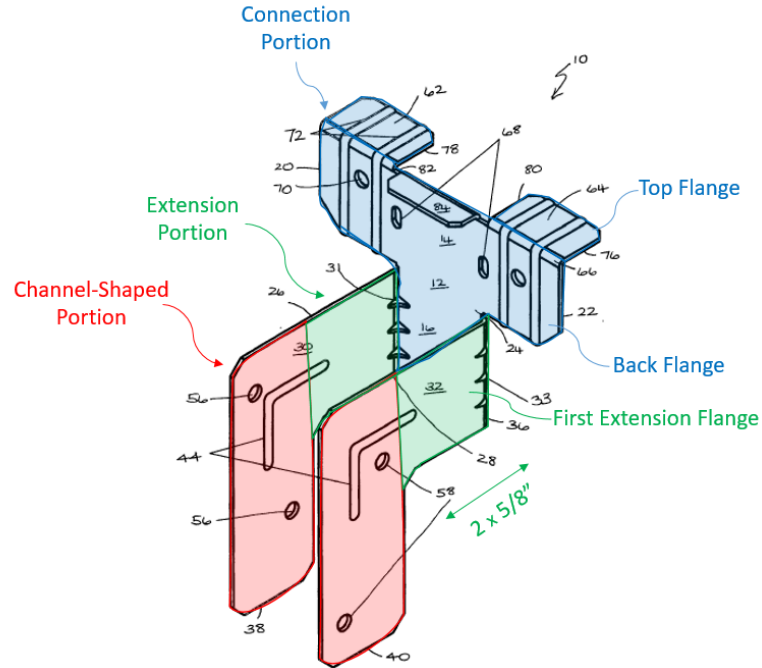


EX1039, FIG. 1 (annotated).

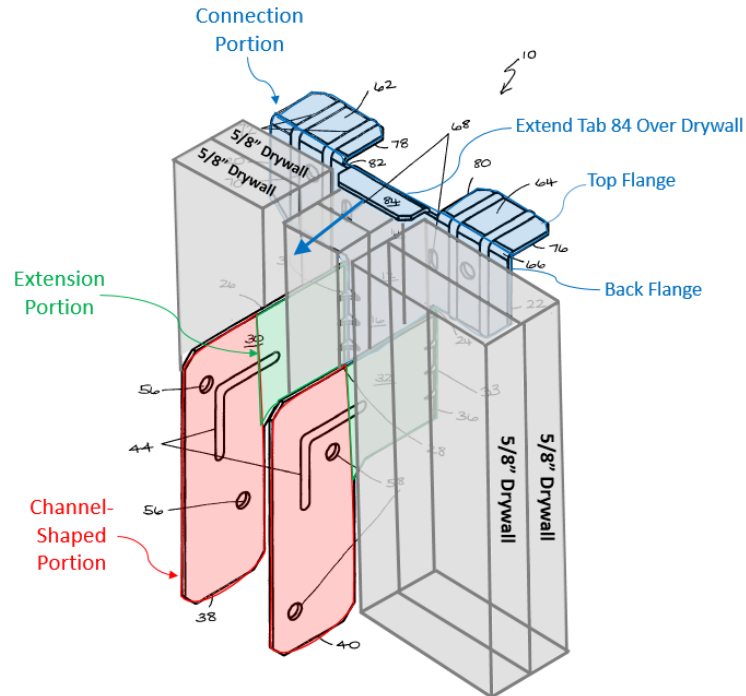
[1.3.B] “the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane”

Cullen’s sidewalls 30, 32 define a space that would permit drywall to be inserted between back plate 12’s surface and legs 38, 40. EX1003, ¶177. While Cullen does not explicitly disclose installing two layers of 5/8-inch-thick drywall between back plate 12’s surface and legs 38, 40, a POSITA would have found it obvious to size the length of Cullen’s sidewalls 30, 32 to define a space for receiving two layers of 5/8-inch-thick drywall therein based on Bundy. *See,*

§VII.A. above, EX1003, ¶¶177-178. Bundy teaches installing two layers of 5/8” drywall between a hanger’s channel shaped portion (Bundy’s side members 11) and wall frame. EX1007, 5:18-20; EX1003, ¶¶177-178. A POSITA would have had an expectation of success in defining a specifically-sized drywall space between the surface of Cullen’s back plate 12 and legs 38, 40, because Cullen’s and Bundy’s hangers are used for similar purposes (e.g., hanging a joist to a wall) and Cullen’s back plate 12 and legs 38, 40 already define a space therebetween. EX1003, ¶¶178-179; EX1007, 4:46-51; EX1039, 10:29–11:1. And as the length of Cullen’s location tab 84 is simply a design choice, a POSITA would have also understood to adjust the length of Cullen’s location tab 84 accordingly to extend across two layers of 5/8” drywall to ensure that the joist’s top surface is still “coplanar” with the top plate’s upper surface. EX1003, ¶¶178-179; EX1039, 12:20–13:5. Cullen states that when the joist hanger includes a seat portion, “additionally, the joist hanger may include a location tab.” EX1039, 5:25-26.



EX1039, FIG. 1 (annotated).



EX1039, FIG. 1 (annotated).

[1.4] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

Cullen discloses that the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another in the form of a folded metal sheet. EX1003, ¶¶180-181; EX1039, 5:26-28, 8:12-19, 10:12-14.

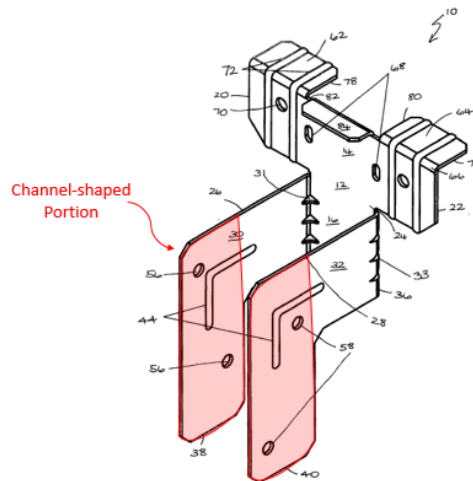
C. Independent Claim 53

[53.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

As discussed above with respect to claim 1, element [1.P], Cullen-Bundy render obvious this limitation. EX1003, ¶¶182.

[53.1] “a channel-shaped portion configured to receive the structural component,”

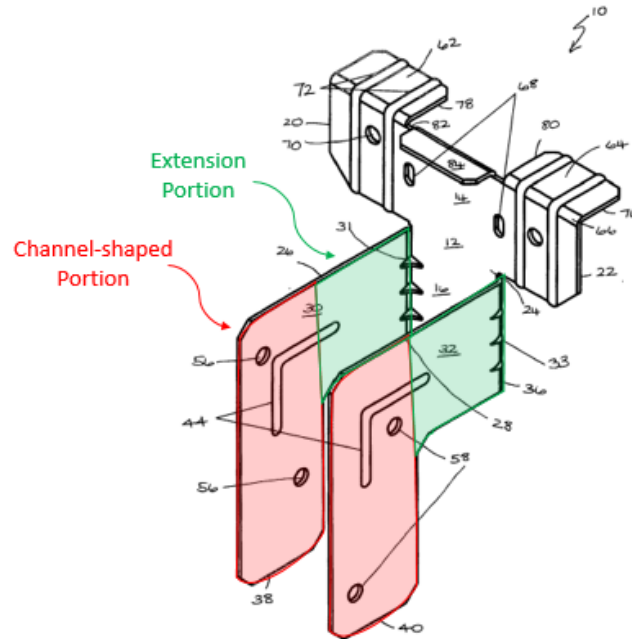
As discussed with respect to claim 1, element [1.1.A], Cullen discloses this limitation. EX1003, ¶183; EX1039, 10:29-11:1, 17:20-25, FIG. 1.



EX1039, FIG. 1 (annotated).

[53.2] “an extension portion extending from the channel-shaped portion and configured to extend through the two layers of 5/8-inch-thick drywall;”

Cullen discloses an extension portion (side walls 30, 32) extending from the channel-shaped portion (legs 38, 40) to the back flange (plate 12). EX1003, ¶¶184-185; EX1039, 10:29–11:1. While Cullen does not explicitly disclose extending sidewalls 30, 32 through drywall, a POSITA would have been motivated to size Cullen’s sidewalls large enough to receive two layers of 5/8-inch-thick drywall between Cullen’s back plate 12 and legs 38, 40, as taught by Bundy. EX1003, ¶¶184-185; EX1007, 5:18-20. In doing so, a POSITA would have understood that Cullen’s sidewalls 30, 32 are configured to extend into one side of such drywall and out of the other side of such drywall when such drywall is installed, because Cullen’s sidewalls 30, 32 are flat sheet metal extending continuously from back plate 12 to legs 38, 40, just like the extension flanges described in the ’626 patent. EX1003, ¶185. Thus, as modified by Bundy, Cullen’s sidewalls 30, 32 are configured to extend through two layers of 5/8-inch-thick drywall. *Id.*, ¶¶185-186.



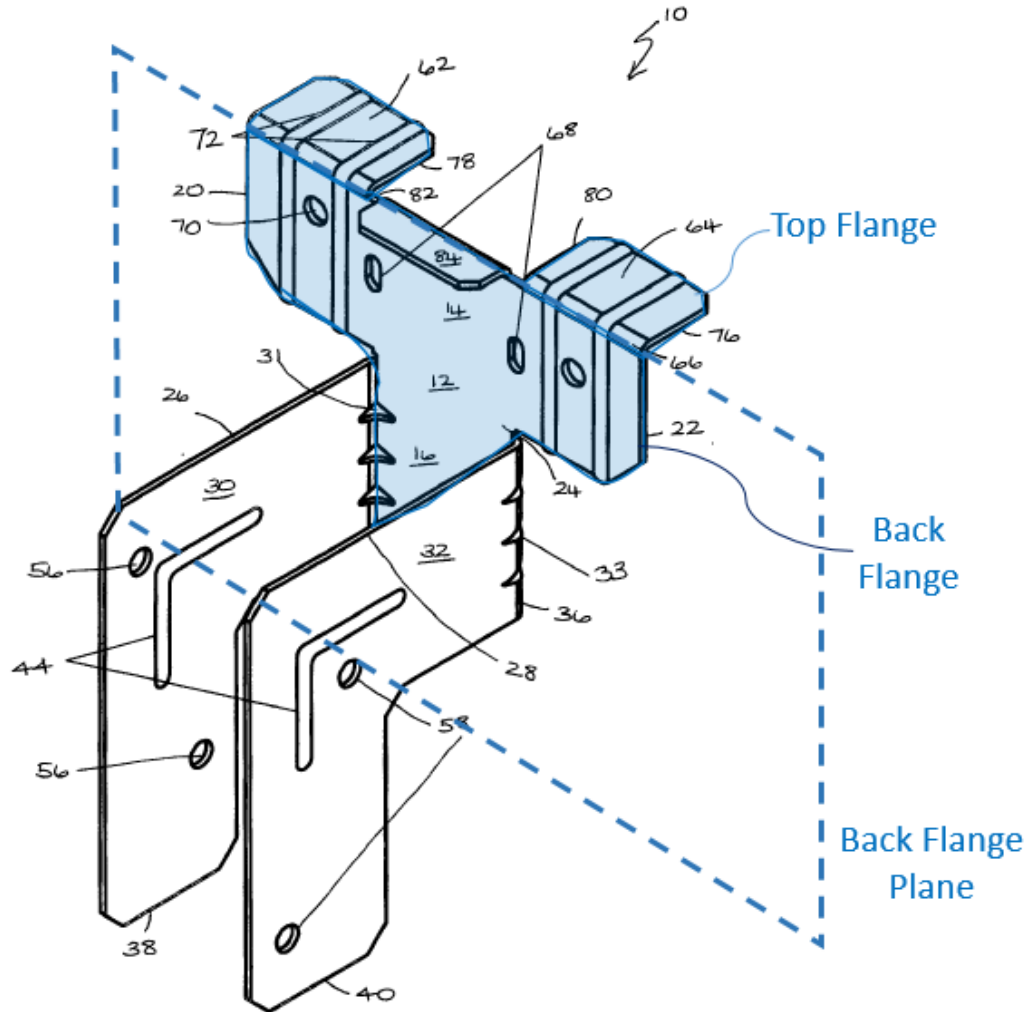
EX1039, FIG. 1 (annotated).

[53.3.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

As discussed above with respect to claim 1, element [1.2.A], Cullen-Bundy discloses obvious this limitation. EX1003, ¶187; EX1039, 3:3–7, 11:24–29

[53.3.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

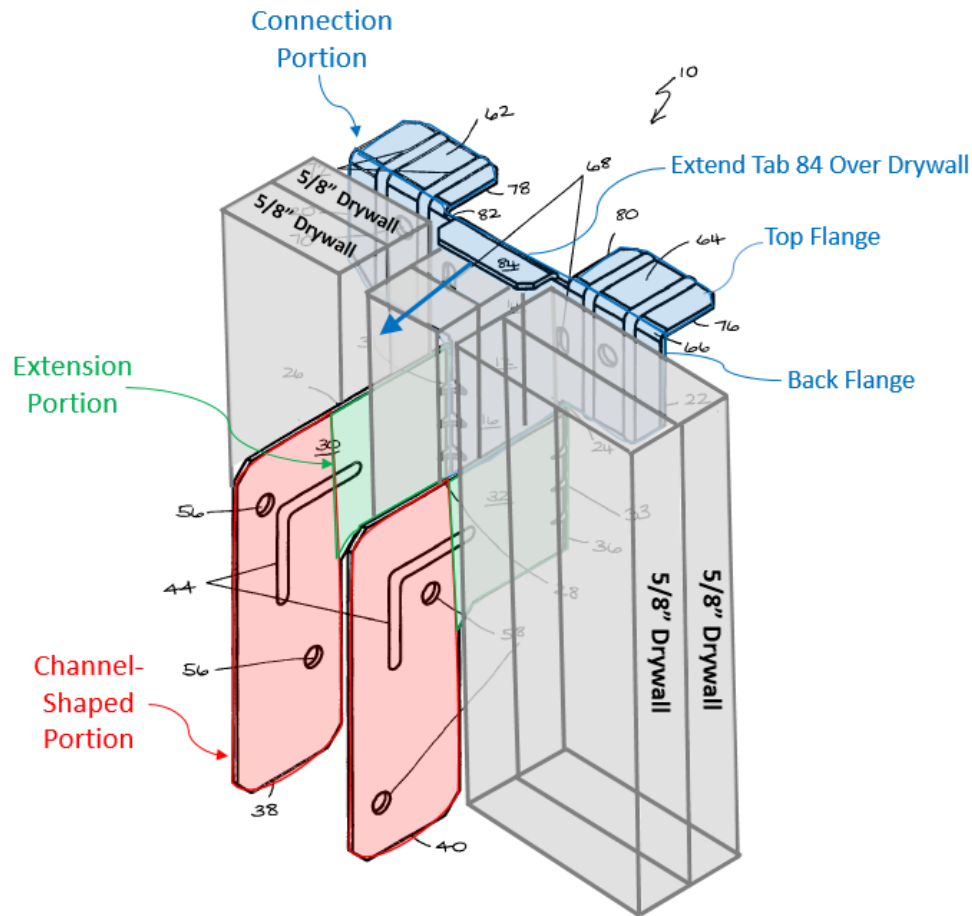
As discussed above with respect to claim 1, element [1.2.B], Cullen-Bundy renders obvious this limitation. EX1003, ¶188; EX1039, 10:16–22,



EX1039, FIG. 1 (annotated)

[53.4] “the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane”

As discussed above with respect to claim 1, element [1.3.B], Cullen–Bundy renders obvious this limitation. EX1003, ¶189; EX1007, 5:18–20; EX1039, FIG. 1.



EX1039, FIG. 1 (annotated).

[53.5] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

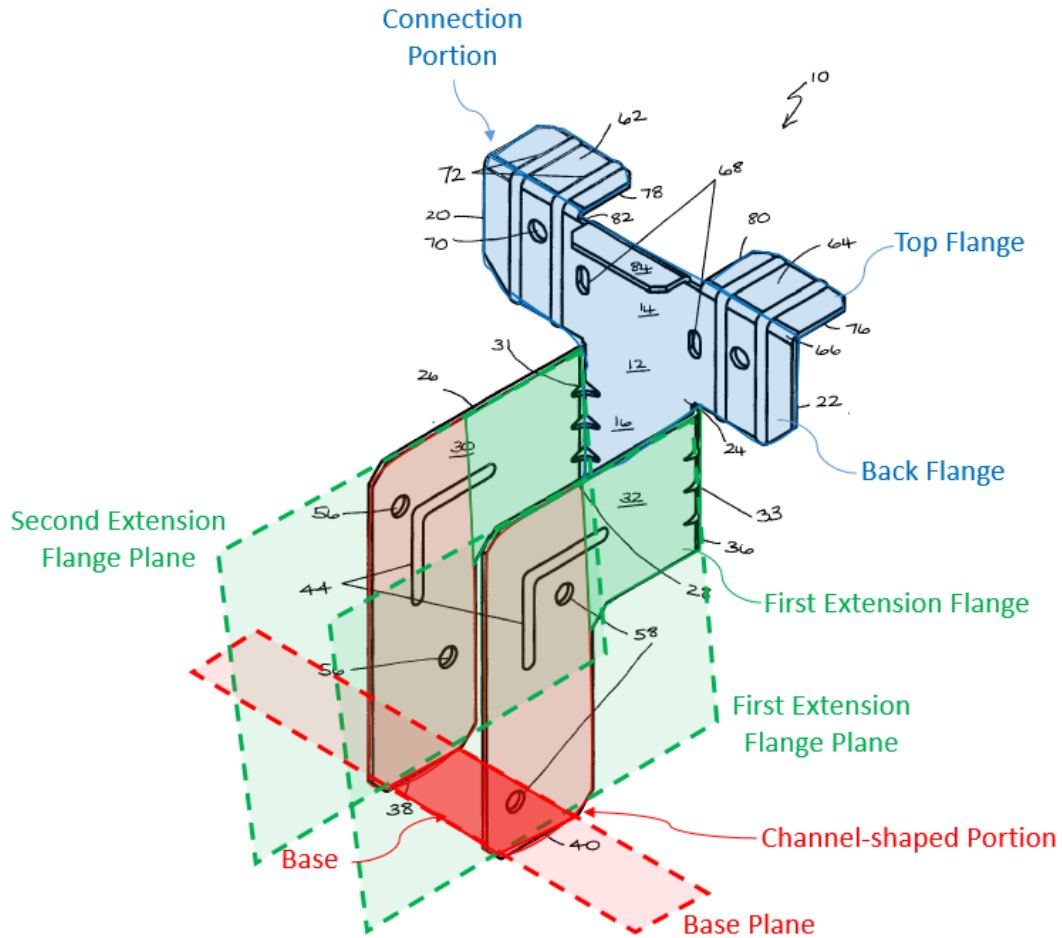
As discussed above with respect to claim 1, element [1.4], Cullen discloses this limitation. EX1003, ¶190; EX1039, 8:12–19, 10:12–14.

D. Claims 9, 13, and 61–62

As discussed in sections [1.3.A] and [53.2], Cullen discloses that its sidewalls 30, 32 are directly connected to both its back plate 12 and its legs 38, 40. Cullen thus discloses the extension portion including a first extension flange

(sidewall 30) and a second extension flange (sidewall 32) extending from the connection portion (back plate 12) to the channel-shaped portion (legs 38, 40) (and vice versa, from the channel-shaped portion to the connection portion). EX1039, 10:29–11:1; EX1003, ¶191. Cullen further discloses that the first extension flange (sidewall 32) is a flat element made of sheet metal, which has a surface lying in a first extension flange plane⁶. EX1039, FIG. 1, 10:12-14. For the same reasons as the first, the second flange lies in a second extension flange plane. Cullen further illustrates that the surfaces of the sidewalls are parallel to each other, and thus the second extension flange and extension flange plane are parallel to the first extension flange and extension flange plane, respectively, as shown below. EX1039, FIG. 1, 10:29–30; EX1003, ¶191.

⁶ To the extent that Cullen’s strengthening ribs 44 are identified as portions of the sidewalls that do not lie in an extension flange plane (which Petitioner does not concede), it would have been obvious to a POSITA to form the sidewalls from a sufficient grade of sheet metal without ribs so as to simplify the manufacturing process. EX1003, ¶191. Indeed, Cullen states “Bracket 10 is formed from a single sheet of metal, the thickness being chosen to provide sufficient strength.” EX1039, 10:12-14.



EX1039, FIG. 1 (annotated)

Cullen discloses “a seat [] located on the legs 38, 40 of the side walls 30, 32 to cradle a joist. The seat is positioned so that the distance between the seat and surface 86 of tab 84 is the height of the joist being used.” EX1039, 17:20–25. A POSITA would have understood that Cullen’s seat corresponds to the recited “base” and that it would have been thus obvious to modify Cullen’s hanger 10 shown in Figures 2–4 to include a base (the “seat”) configured to receive and support the joist’s end portion, as illustrated above. EX1003, ¶192. “Where the

joist hanger is formed from sheet metal the seat...can be folded into position also.”

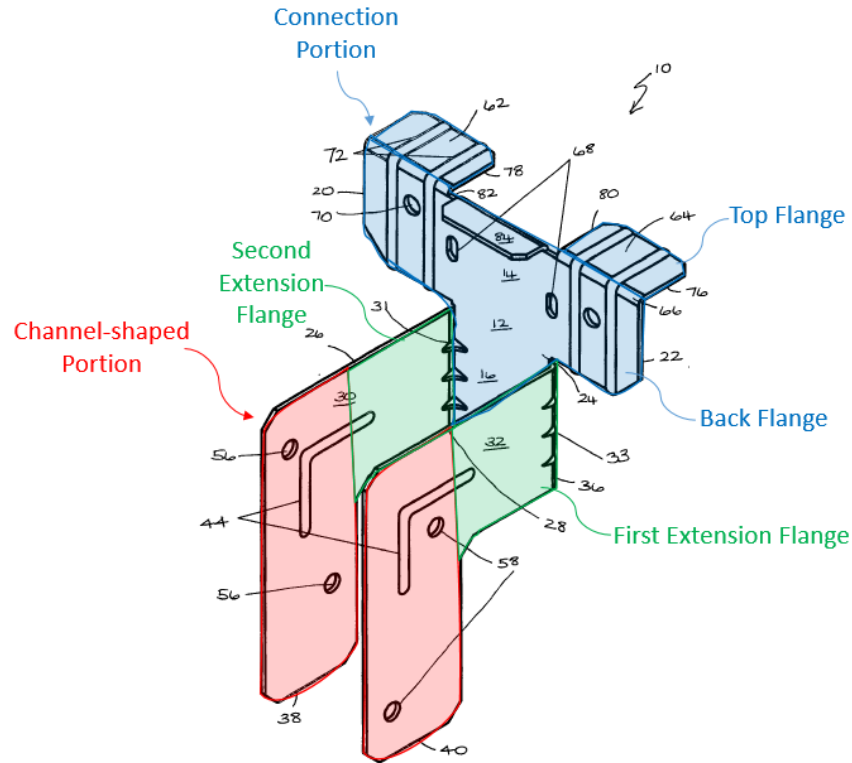
EX1039, 5:25-29; 13:16-26; 19:26-30.

If the seat is formed by folding a metal shelf up from one of the legs 38, 40, a POSITA would have understood that the seat would be welded or otherwise joined to the other leg for structural integrity, such that each leg is joined to and extends upward from the seat. EX1003, ¶193. A POSITA would have further understood that such a seat may instead be formed by bending lower portions of each leg 38, 40 inward to meet in the middle. *Id.*

The base is made out of sheet metal (EX1039, 5:25-29), and thus has an upper surface arranged to engage the joist by receiving the joist’s end portion. EX1003, ¶194. The base’s upper surface is generally horizontal to hold the joist, and lies in a base plane (illustrated above) (EX1003, ¶194). A POSITA would have understood the base plane is thus perpendicular to the vertical first and second extension flanges and extension flange planes, as shown above. EX1003, ¶¶194-195.

E. Claims 10 and 63

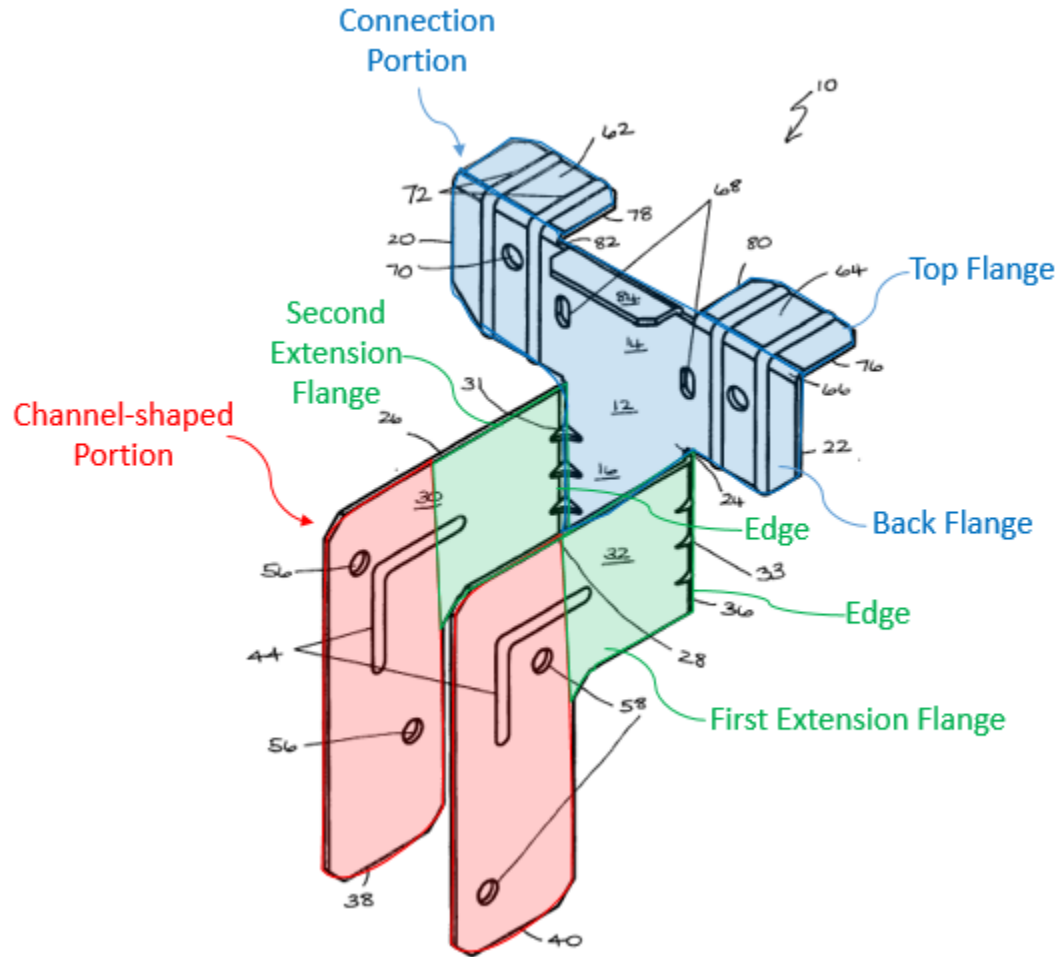
For similar reasons as for claims 9, 13, and 61-62, Cullen discloses first and second extension flanges (sidewalls 30, 32) that are flat elements made from sheet metal, and thus generally planar. EX1003, ¶¶196-197; EX1039, Fig. 1, 10:10–14.



EX1039, FIG. 1 (annotated).

F. Claims 11 and 64

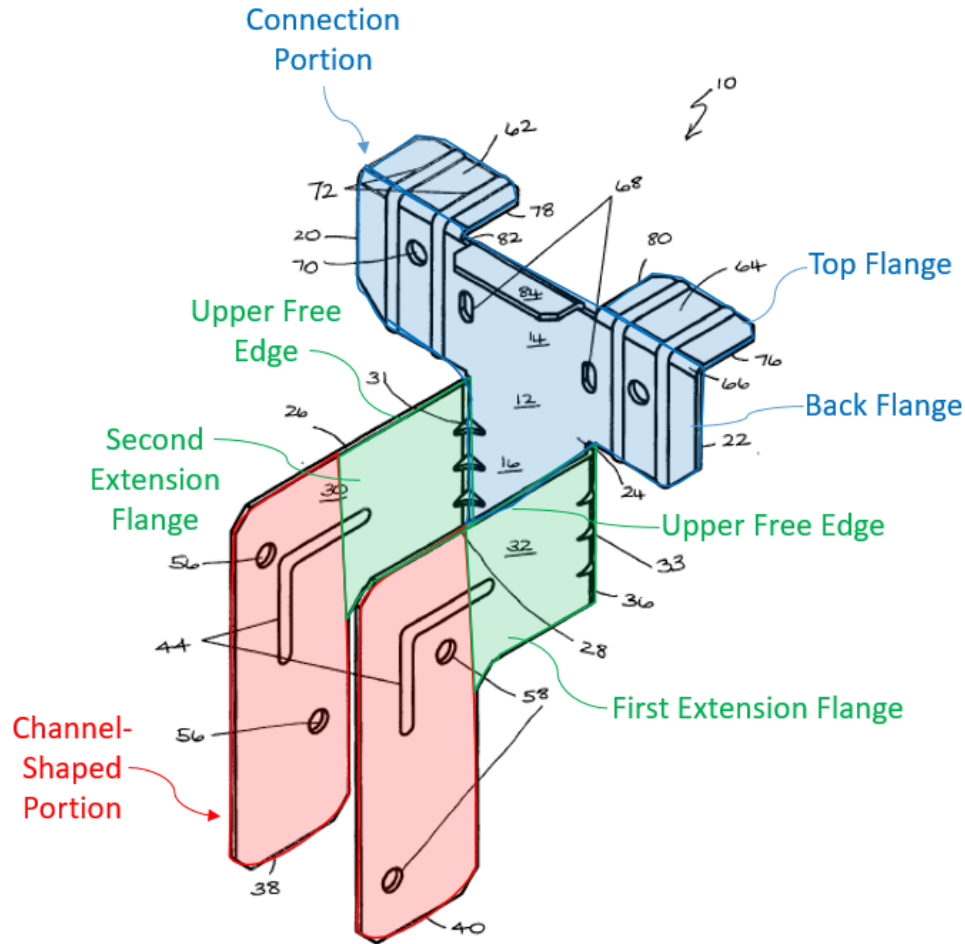
Cullen discloses first and second extension flanges (sidewalls 30, 32) each including an edge (i.e., where each extension flange joins its respective back flange), as shown below. EX1039, FIG. 1; EX1003, ¶198. When the teachings of Bundy are combined with Cullen's hanger as discussed in §VII.A., the resulting first and second extension flanges (sidewalls 30, 32) each have a length sufficient to accommodate two layers of 5/8-inch-thick drywall and extend edgewise through the drywall when two layers of 5/8-inch-thick drywall are installed between the resulting hanger's legs and back plate. EX1003, ¶¶198-199.



EX1039, FIG. 1 (annotated).

G. Claims 12 and 65

Cullen discloses first and second extension flanges (sidewalls 30, 32) each including an upper free edge, as shown below. EX1039, FIG. 1; EX1003, ¶¶200-201.

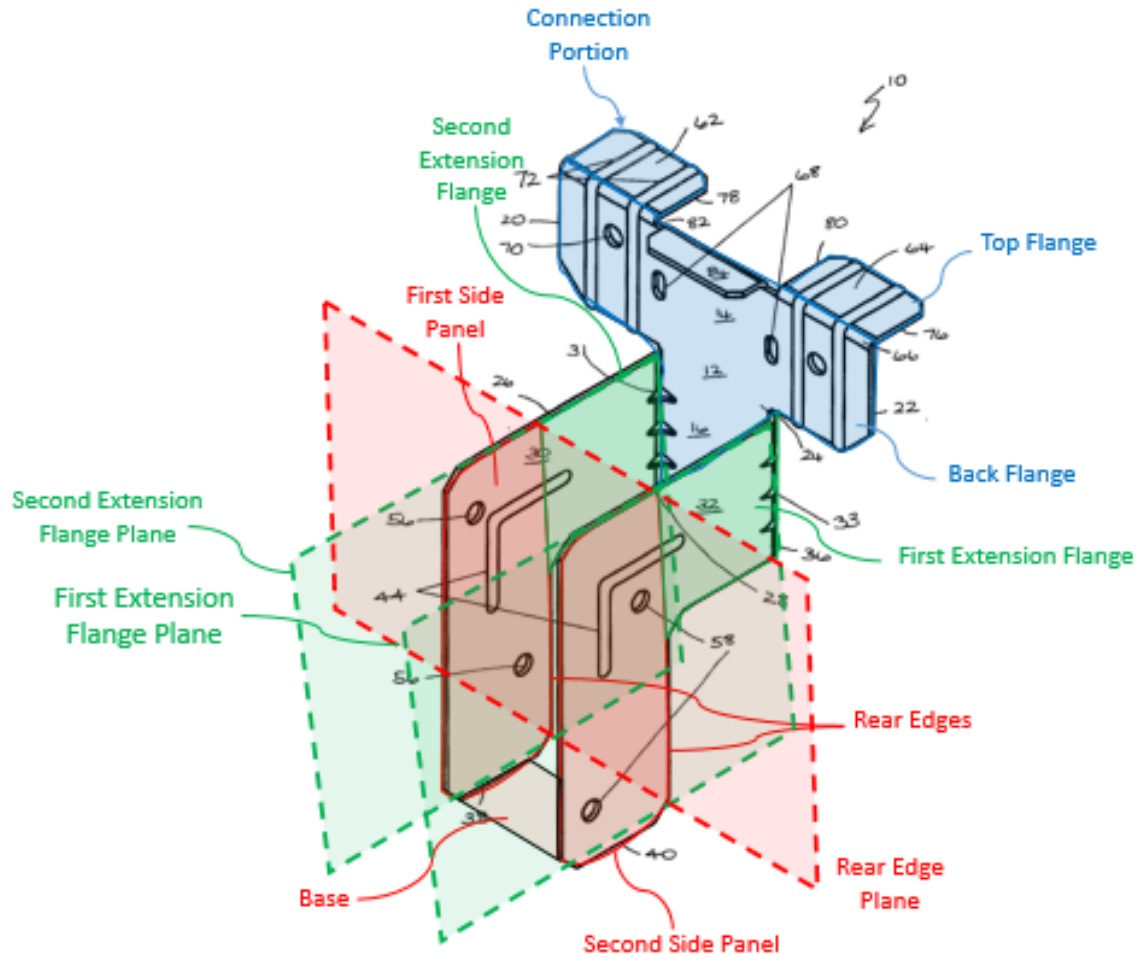


EX1039, FIG. 1 (annotated).

H. Claims 14 and 66

Cullen discloses that the channel-shaped portion includes first and second side panels (legs 38, 40) extending upward from the base (seat). EX1039, 10:29–30. Each side panel has a vertical rear edge, the two edges defining (and thus lying in) a rear edge plane. EX1039, FIG. 1; EX1003, ¶202. As the side panels are vertical and symmetrical, having symmetrical spacing between the back flange and the vertical rear edges, the rear edge plane is perpendicular to the first and second

extension flanges and extension flange planes, as shown below. EX1039, FIG. 1, 10:29-30; EX1003, ¶¶202-203.

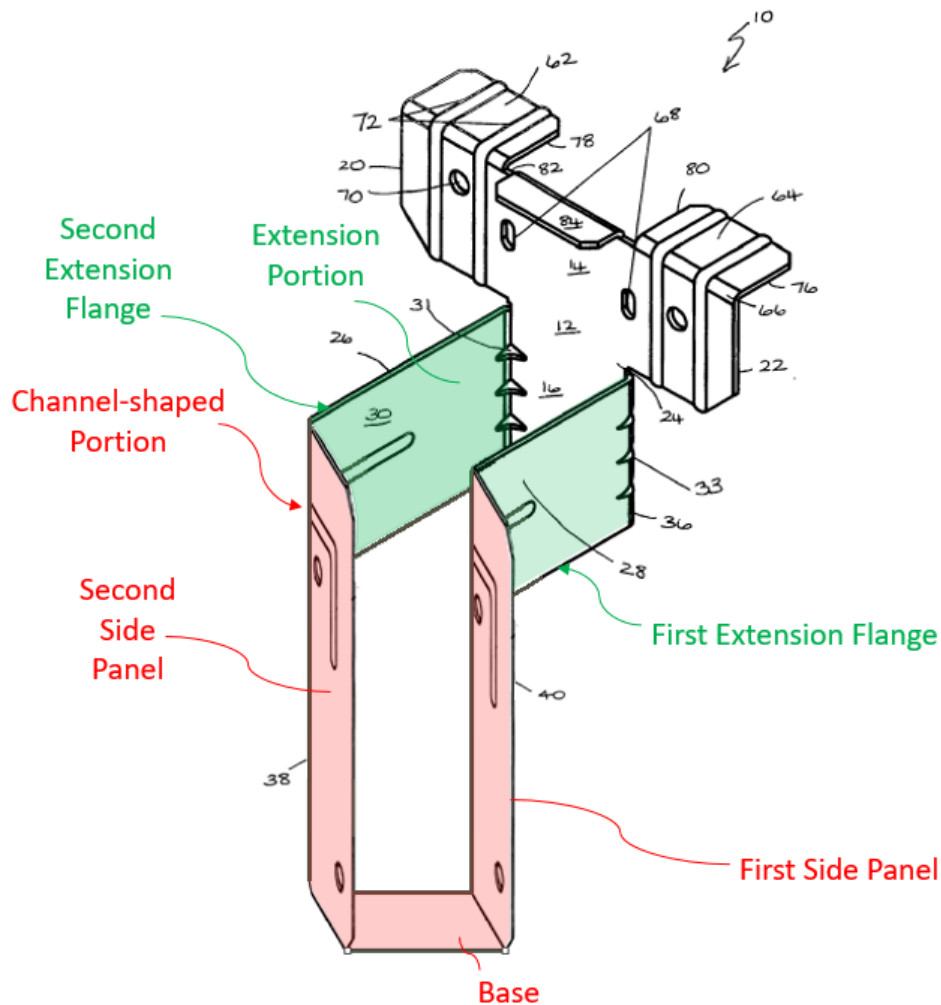


EX1039, FIG. 1 (annotated).

I. Claims 15 and 67

As discussed for claims 14 and 66, Cullen discloses that the channel-shaped portion includes first and second side panels (legs 38, 40) extending upward from the base (seat) and each having a vertical rear edge lying in a rear edge plane, as shown above. EX1039, FIG. 1; EX1003, ¶204. While the figures in Cullen do not

illustrate legs 38, 40 being skewed with respect to the first and second extension flange planes defined by sidewalls 30, 32, Cullen describes that “[t]hose skilled in the art will also appreciate that the features described can also be used for skewed and sloped hangers.” EX1039, 20:1–5. Accordingly, it would have been obvious to a POSITA to skew the legs of the Cullen-Bundy hanger 38, 40 by bending them at a non-orthogonal angle along the vertical join line between legs 38, 40 and sidewalls 30, 32, as shown in the below rendering. EX1003, ¶204.



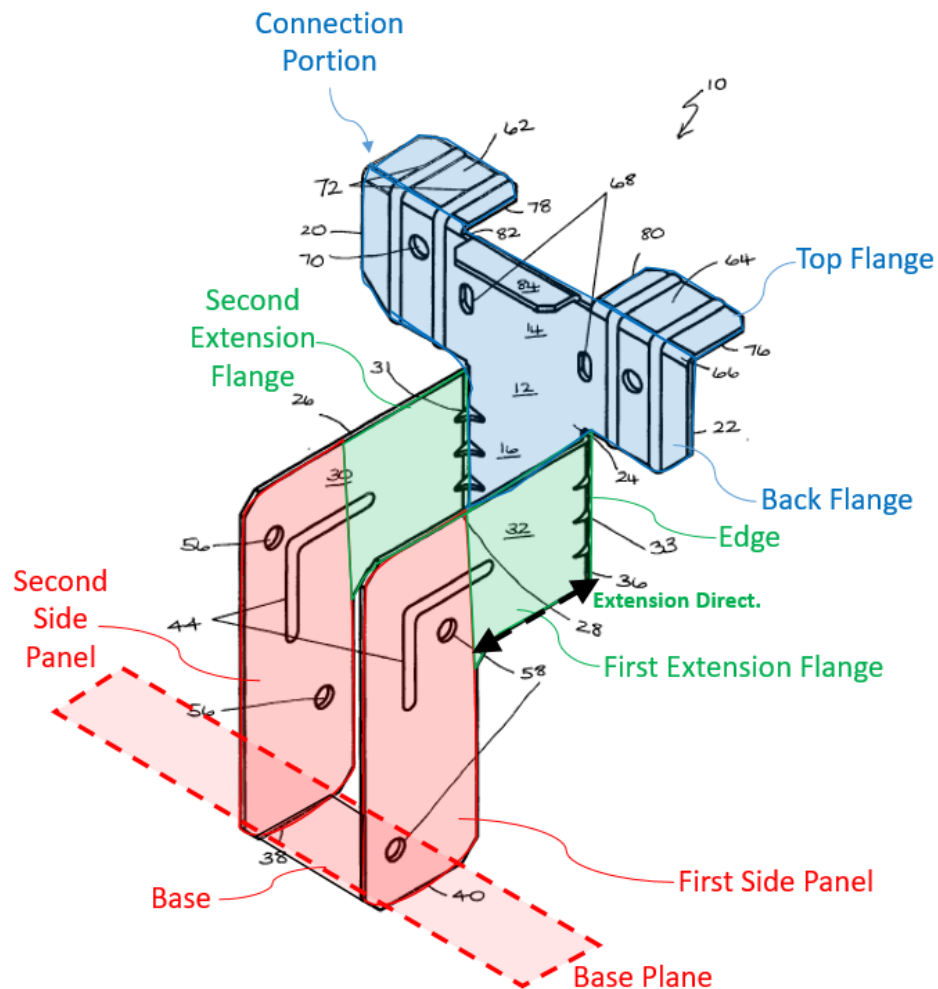
EX1039, FIG. 1 (rendering).

In order to maintain the width of the channel-shaped portion, a POSITA would have further understood to extend one of the extension flanges (sidewalls) further out along its extension flange plane before bending the hanger between the extension flange and side panel at an angle to create the channel (see above rendering) while maintaining the Cullen-Bundy drywall space. *Id.* As such, the rear edge plane defined by rear edges of legs 38, 40 is oriented at a skewed angle to the first and second extension flanges and extension flange planes, in order to secure a joist to a wall frame at a non-orthogonal angle. EX1003, ¶205. A POSITA would have had a reasonable expectation of success in doing so because the known technique of altering the orientation of Cullen-Bundy's hanger's channels-shaped portion by bending sheet metal was well within the level of ordinary skill. EX1003, ¶¶205-206; *see* EX1043, FIGS. 4–5; EX1044, FIG. 9; EX1045, 2.

J. Claims 21 and 73

As discussed for claims 9 and 61, Cullen renders obvious the channel-shaped portion including a base (Cullen's seat) configured to receive and support a structural component's end portion and having an upper surface arranged to engage the structural component and lying in a base plane. As discussed for claims 9, 13, and 61-62, Cullen discloses the extension portion including both a first extension flange (sidewall 30) and a second extension flange (sidewall 32). Cullen discloses that each of the first and second extension flanges (sidewalls 30, 32) includes an

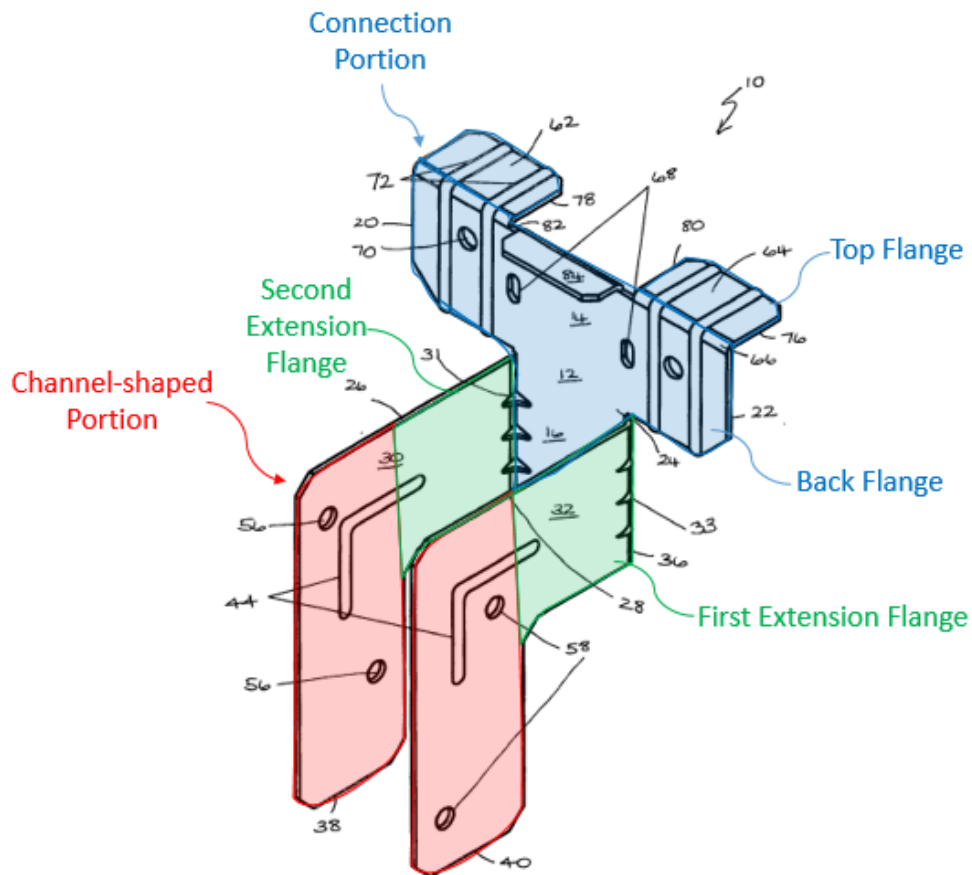
edge (bend line between back plate 12 and the sidewall). There are no intervening components between the channel-shaped portion and each extension flange, so each of the first and second extension flanges extends edgewise from the channel-shaped portion toward its respective back flange and the back flange plane in an extension direction (shown in black below) that is parallel to the base plane (i.e., horizontal), as shown below. EX1039, FIG. 1; EX1003, ¶¶207-208.



EX1039, FIG. 1 (annotated).

K. Claims 29 and 81

As discussed with respect to claims 9, 13, and 61–62, Cullen discloses first and second extension flanges extending from the connection portion to the channel-shaped portion (and vice versa, as recited in claim 81) and being parallel to one another. EX1039, 10:29–30; EX1003, ¶¶209-210.

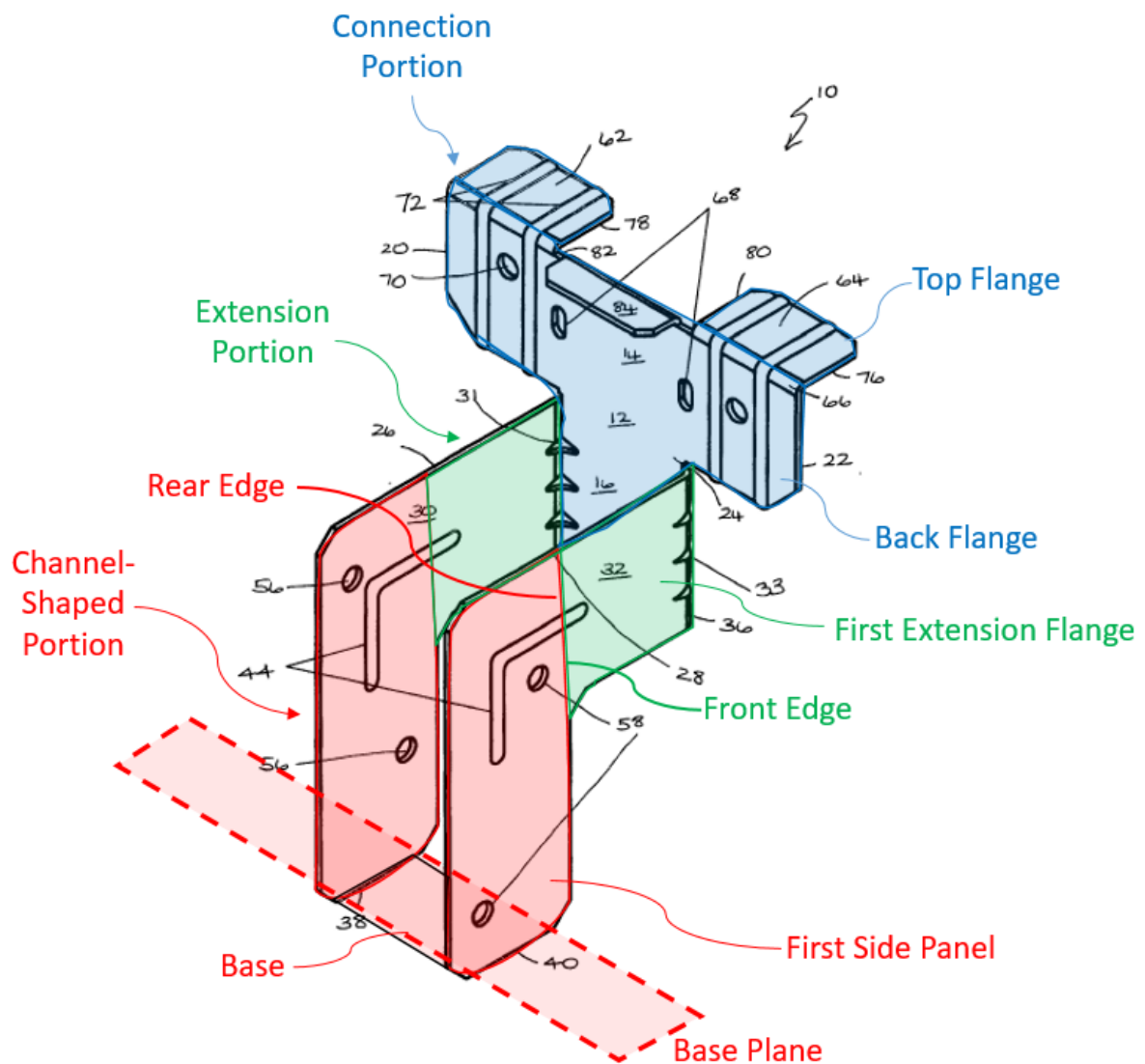


EX1039, FIG. 1 (annotated).

L. Claims 30 and 82

As discussed for claims 9, 13, and 61-62, Cullen discloses that its extension portion includes a first extension flange (sidewall 30) and a second extension

flange (sidewall 32) extending from the connection portion (back plate 12) to the channel-shaped portion (which includes legs 38, 40) (and vice versa). As discussed for claims 9, 14, 61, and 66, Cullen discloses that the channel-shaped portion (red) includes a base (annotated below) configured to receive and support the structural component's end portion and a first side panel (annotated below) extending upward from the base. EX1003, ¶211.

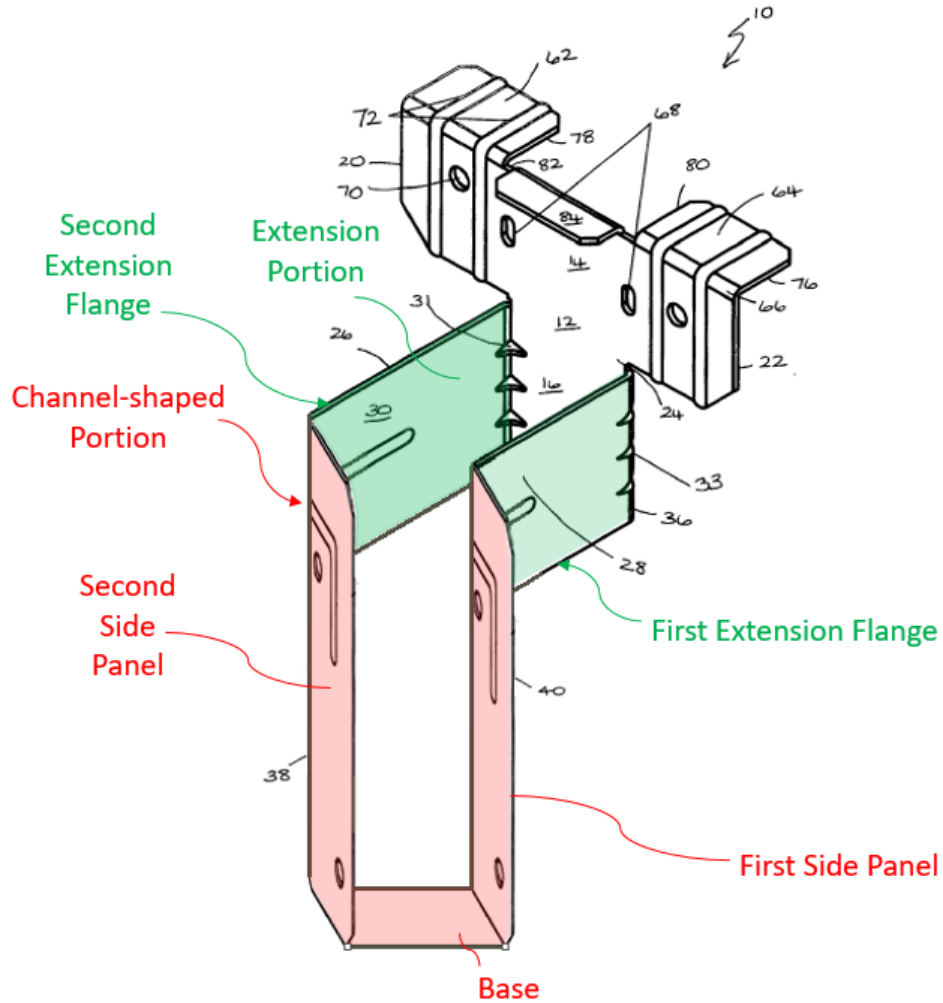


EX1039, FIG. 1 (annotated).

Cullen further discloses a front edge of the first extension flange (sidewall 32) abutting a rear edge of the first side panel (leg 40), shown above, as they join with no intervening structures therebetween. EX1039, FIG. 1; EX1003, ¶¶211-213.

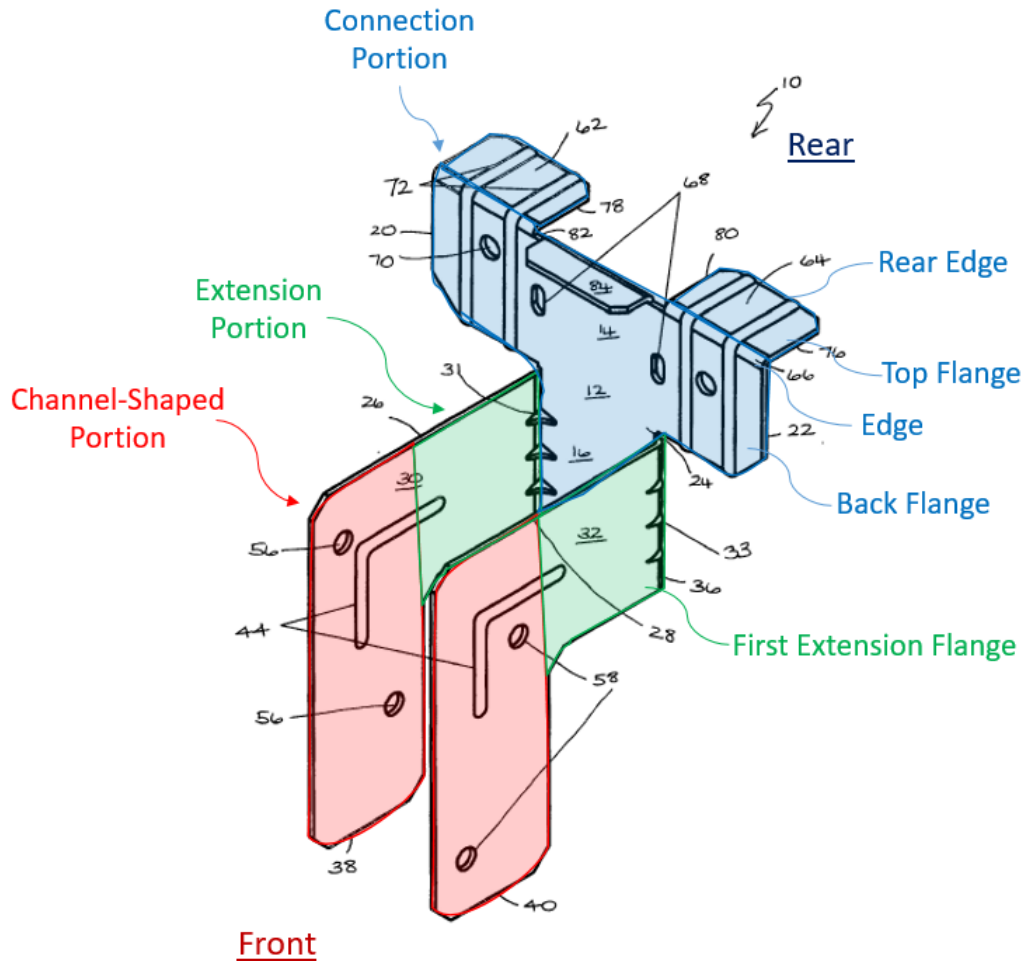
M. Claims 31 and 83

For the reasons discussed for claims 30 and 82, Cullen discloses a front edge of the first extension flange (sidewall 32) being directly attached to and abutting a rear edge of the first side panel (leg 40). Cullen's figures do not show a bend at such abutment. But as discussed for claims 15 and 67, in employing the teachings of Cullen's skewed hanger embodiment, a POSITA would have found it obvious to bend the Cullen-Bundy hanger so the channel-shaped portion would hold a structural member at a skewed angle from the wall. To reduce the complexity in cutting drywall for installation between the non-orthogonal channel-shaped portion and connection portion, a POSITA would have kept the extension flanges of the Cullen-Bundy hanger orthogonal to the wall. EX1003, ¶¶214-215. A POSITA would thus have added a bend to the hanger where the front edge of the first extension flange (sidewall 32) abuts the rear edge of the first side panel (leg 40), on the other side of Cullen-Bundy's drywall space from the wall (see rendering below). *Id.*



N. Claims 32 and 84

Cullen discloses that the top flange (bearing plates 62, 64) includes a rear edge located rearwardly of the edge (fold line 66) of the top flange (bearing plates 62, 64) from which the back flange (back plate 12) extends, the rear edge also located rearwardly of the back flange (back plate 12), as shown below. EX1039, FIG. 1; EX1003, ¶¶216-217.

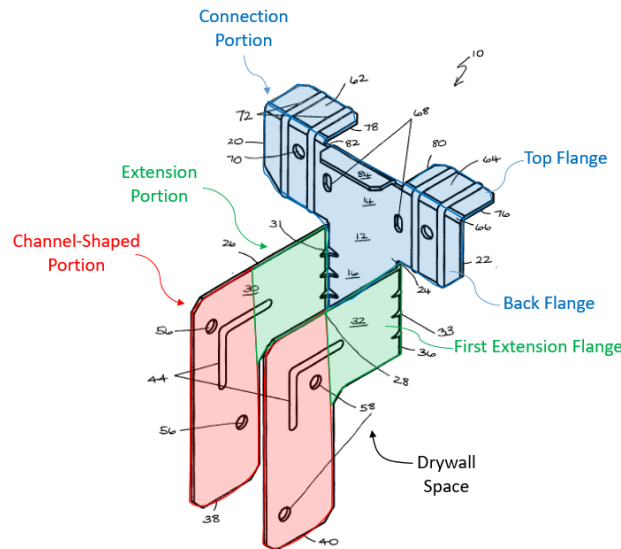


EX1039, FIG. 1 (annotated).

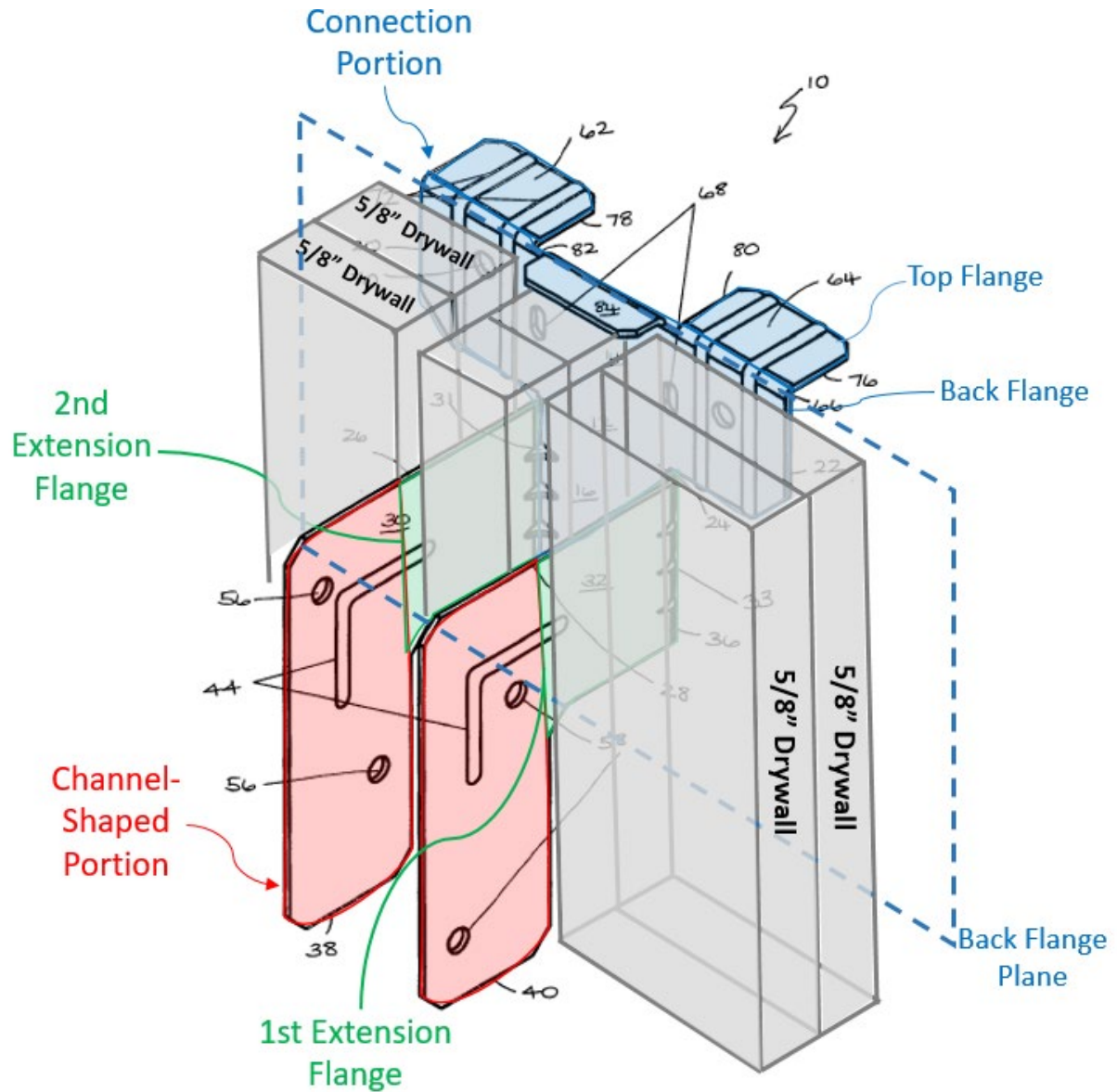
O. Claims 33-35 and 85-86

In employing the teachings of Bundy's drywall space with Cullen's hanger 10, the Cullen-Bundy combination renders obvious a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein. EX1007, 5:10–22. As discussed for claims 9, 13, 61, and 62, Cullen discloses that the extension portion includes a first extension flange and a second extension flange extending from the connection portion to the channel-shaped portion. For the reasons

discussed for claims 1 and 53, a POSITA would have sought to modify the length of Cullen's sidewalls 30, 32, as taught by Bundy. This modification would have resulted in a drywall space sized and shaped to receive two layers of 5/8-inch-thick drywall between Cullen's legs 38, 40 and back plate 12. As the channel-shaped portion (legs 38, 40) and back flange plane (defined by the surface of Cullen's back plate 12) of the Cullen-Bundy combination define the drywall space's size and shape, they bound the drywall space. EX1039, FIG. 1; EX1007, 5:10-22; EX1003, ¶¶218-219. Because the first and second extension flanges of the Cullen-Bundy combination further define the drywall space's size and shape, they also each bound the drywall space. *Id.*



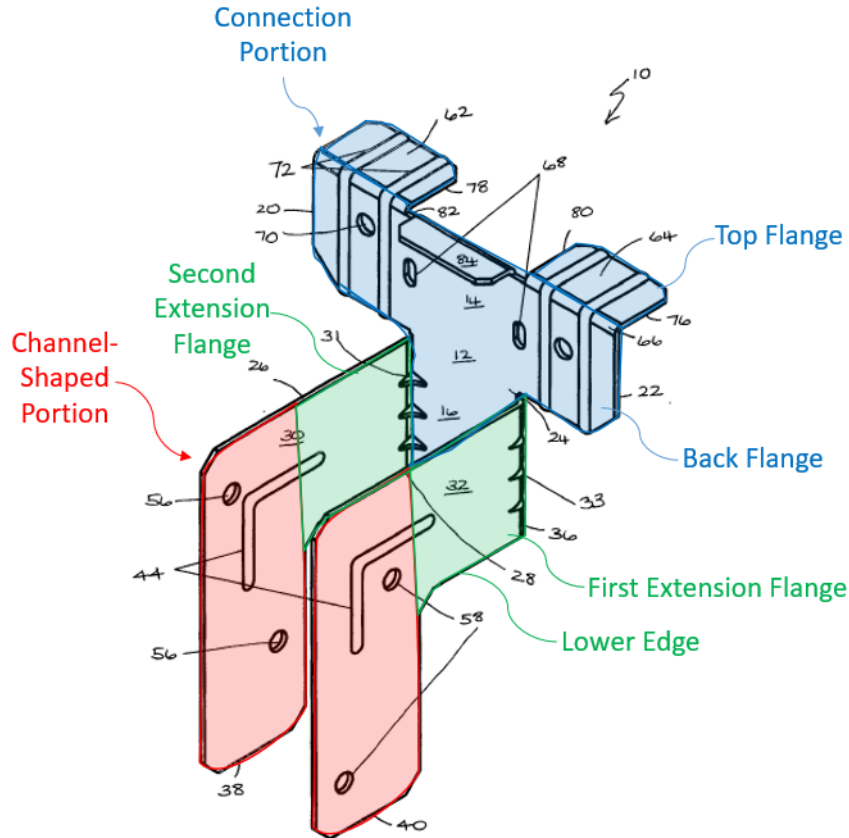
EX1039, FIG. 1 (annotated).



EX1039, FIG. 1 (annotated).

P. Claims 87 and 88

Cullen discloses that the first and second extension flanges (sidewalls 30, 32) include a lower edge, as shown below. EX1039, FIG. 1; EX1003, ¶220.

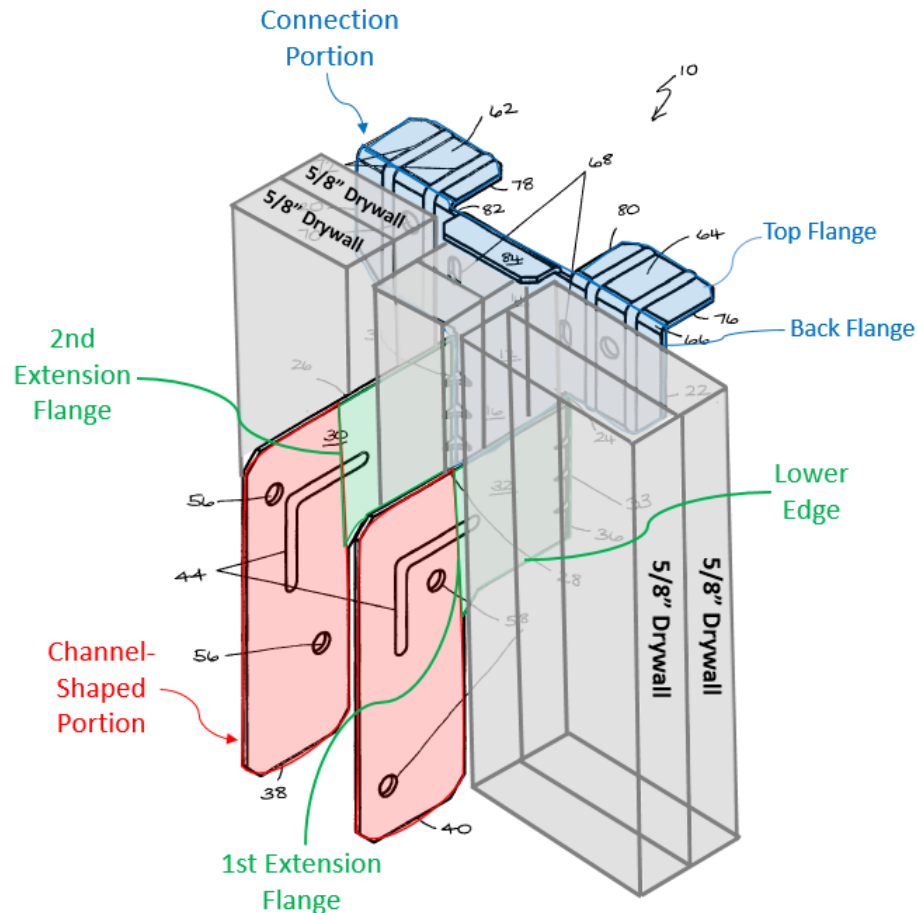


EX1039, FIG. 1 (annotated).⁷

In employing the teachings of Bundy's drywall space with Cullen's hanger 10 as discussed for claims 85-86, the Cullen-Bundy combination renders obvious that the lower edge of the first and second extension flanges (sidewalls 30, 32) and the back flange (back plate 12) of the Cullen-Bundy combination define the

⁷ Cullen's sidewall 30 and leg 38 are symmetrical to sidewall 32 and leg 40, and therefore, any feature shown on sidewall 32 and leg 40 would correspond to sidewall 30 and leg 48. EX1003, ¶221.

drywall space's size and shape, and thus bound the drywall space. EX1039, FIG. 1; EX1007, 5:10-22; EX1003, ¶¶221-222.

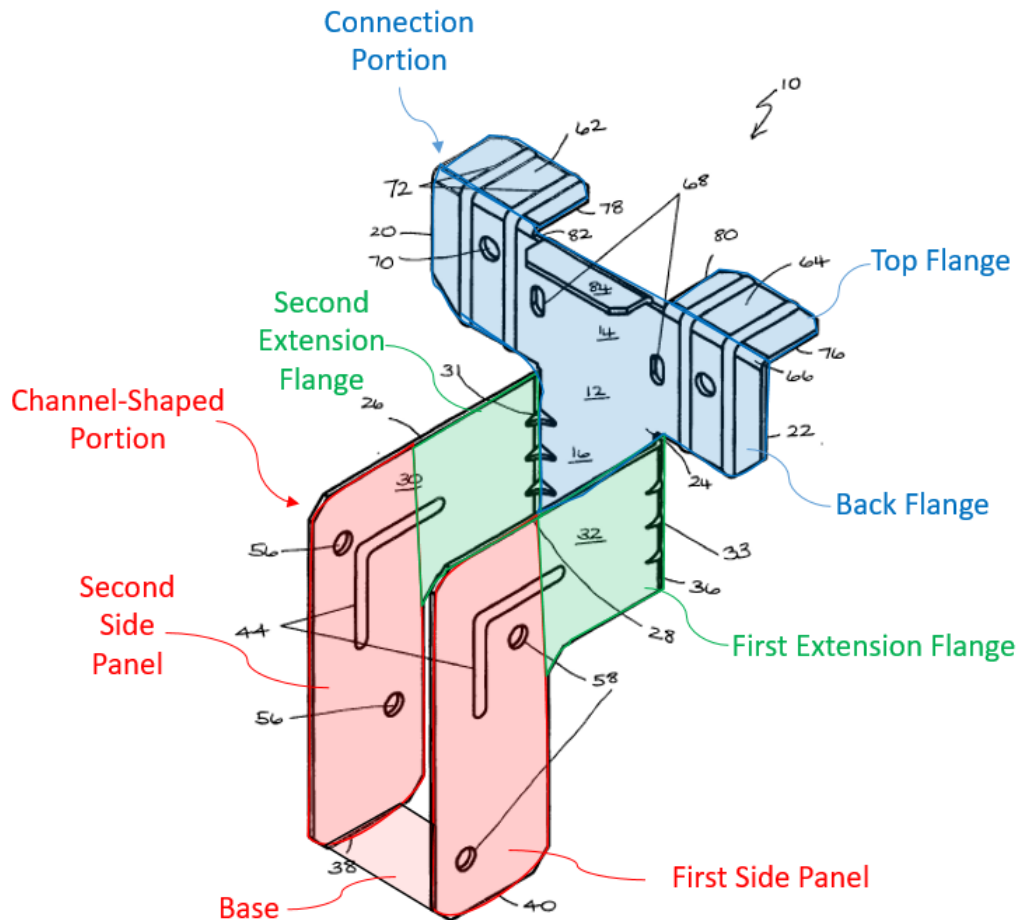


EX1039, FIG. 1 (annotated).

Q. Claims 36 and 89

As discussed for claims 9, 13, and 61-62, Cullen discloses: the channel-shaped portion (red) including a base (annotated below) configured to receive and support the structural component's end portion; the extension portion (green) including first extension and second extension flanges (annotated below) extending from the connection portion (blue) to the channel-shaped portion (red) (and vice-

versa, as recited in claim 89); and the first and second extension flanges (annotated below) being parallel to each other. As discussed for claims 14 and 66, Cullen discloses the first and second side panels extending upward from the base (annotated below). EX1003, ¶223.



EX1039, FIG. 1 (annotated).

Cullen further discloses each side panel (legs 38, 40) being co-planar with its respective extension flange (sidewalls 30, 32), as they share the same vertical orientation. EX1039, FIG. 1, EX1003, ¶224. As the first and second extension

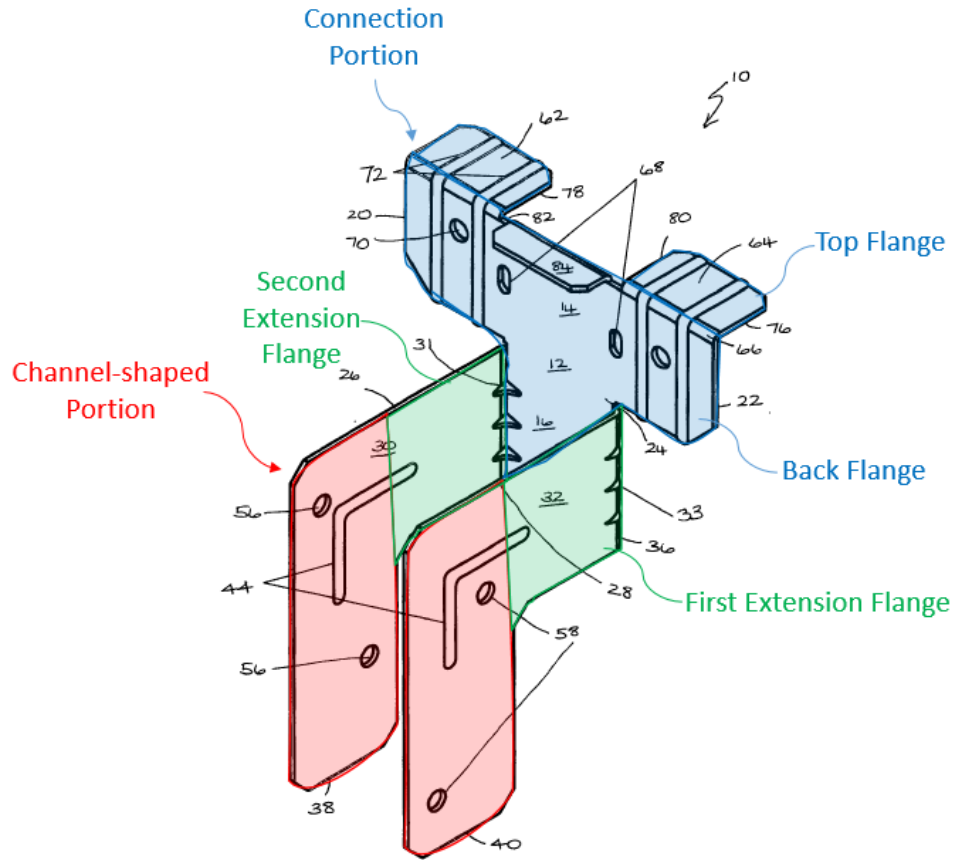
flanges are parallel to each other, and the first and second side panels are respectively co-planar therewith, Cullen discloses the first and second extension flanges and the first and second side panels are all parallel to each other, as shown above. EX1039, FIG. 1; EX1003, ¶¶224-225.

R. Claims 37 and 90

For the reasons discussed for claims 15 and 67, a POSITA would have found it obvious to bend the Cullen-Bundy hanger so the channel-shaped portion would hold a structural component at a non-orthogonal angle from the wall. As the connection portion connects to the wall, and the channel-shaped portion supports the structural member, a POSITA would have understood to arrange Cullen-Bundy's channel-shaped portion with respect to the connection portion so as to mount the structural component at a non-orthogonal angle relative to the frame wall. EX1003, ¶¶226-227.

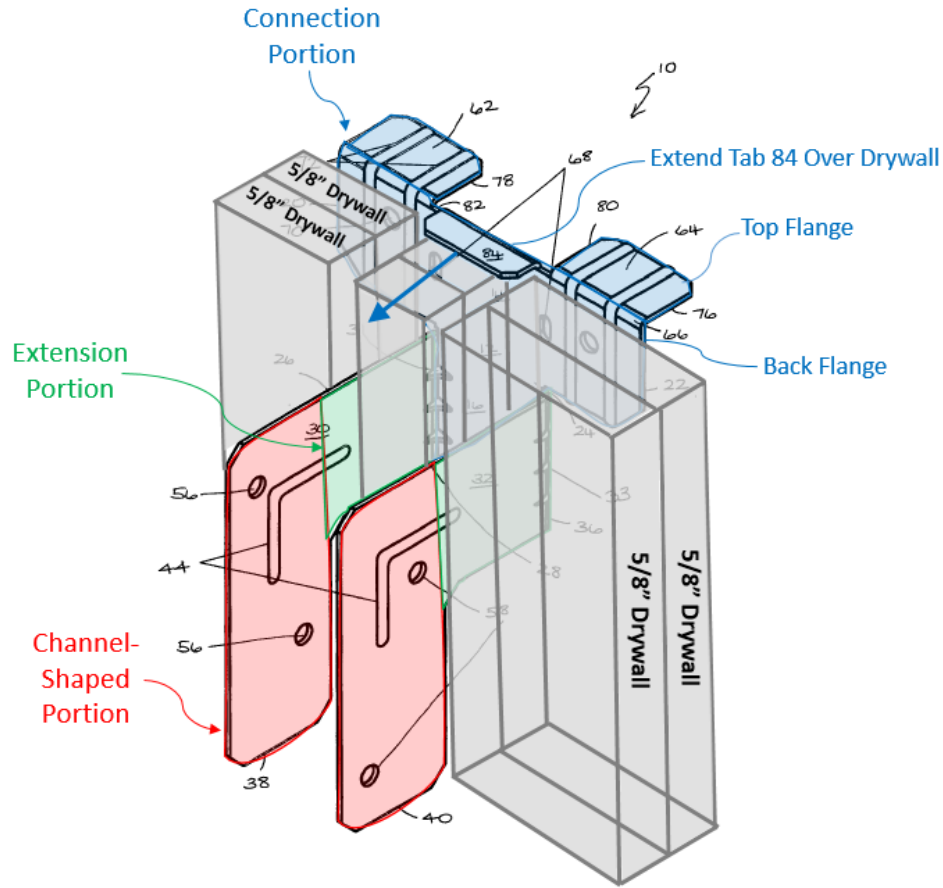
S. Claims 38 and 91

As discussed for claims 9, 13, 61, and 62, Cullen discloses the extension portion including first and second extension flanges (sidewalls 30, 32) extending from the connection portion (back flange 12) to the channel-shaped portion (legs 38, 40) (and vice-versa, as recited in claim 91). EX1003, ¶228.



EX1039, FIG. 1 (annotated).

Because Cullen's sidewalls 30, 32 are in an opposed, face-to-face relation and are symmetrical to each other across a juncture like the extension flanges shown in Figure 7 of the '626 patent, Cullen discloses the first and second extension flanges engaging each other along a juncture, as the term "engage" used in the '626 patent (EX1001, Abstract). EX1003, ¶229. In combining the teachings of Bundy's use of drywall with the Cullen-Bundy hanger, the juncture of the resulting extension flanges (sidewalls 30, 32) would be positioned within the two layers of 5/8-inch-thick drywall. EX1003, ¶¶229-230.



EX1039, FIG. 1 (annotated).

VIII. CLAIMS 1, 9–14, 21, 29, 30, 32–36, 38, 53, 61–66, 73, 81, 82, 84–89, AND 91 WOULD HAVE BEEN OBVIOUS OVER ADAMS IN VIEW OF BUNDY.

Adams, as modified in view of Bundy, renders obvious claims 1, 9–14, 21, 29, 30, 32–36, 38, 53, 61–66, 73, 81, 82, 84–89, and 91 for the following reasons.
EX1003, ¶231.

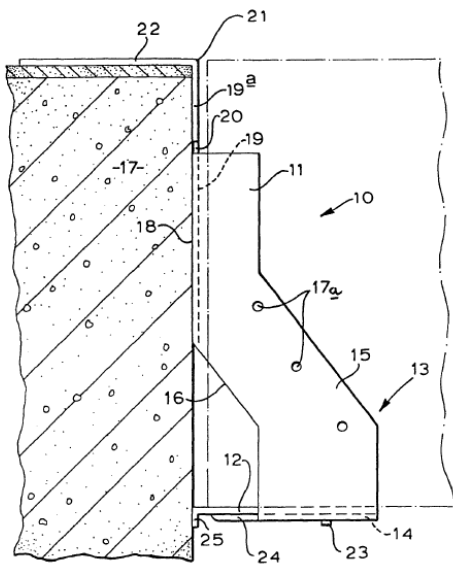
Adams discloses each and every structural element listed in independent claims 1 and 53, but does not explicitly disclose that the space defined between its channel-shaped portion and back flange is sized large enough to receive two layers

of 5/8-inch-thick drywall therein. However, Bundy discloses an analogous firewall hanger that receives two layers of 5/8-inch-thick drywall between its channel-shaped portion and the wall frame. EX1003, ¶¶232. A POSITA would have sought to modify Adams's hanger based on the teachings of Bundy to define a space large enough for receiving two layers of 5/8-inch-thick drywall with a reasonable expectation of success, as explained below.

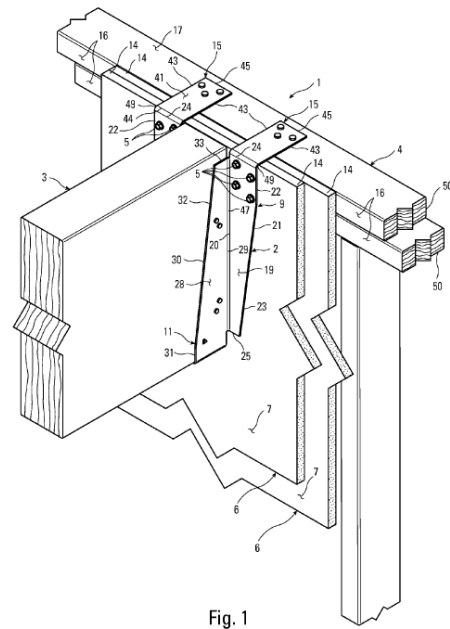
A. Motivation to Modify Adams Based on the Teachings of Bundy.

Adams and Bundy are both directed to joist hangers. EX1003, ¶¶66–71, 233. Adams's hanger 10 defines a space between its back flange (abutment portion 19) and channel-shaped portion (base 14 and portions of stirrup part 13 thereabove) corresponding to the length defined by edge 16 of its sidewall 15, such that a space exists between the wall and the end of the joist. EX1003, ¶¶233-234. "In use, the base 14 is positioned away from the supporting element 17," which may be a timber wall. EX1040, 4:11-21. "This means that the positioning of the joist within the hanger can clearly be seen and the end of the joist can be ventilated through the opening behind the inclined edge 16 of the side walls." *Id.* While Adams spatially separates the joist's end away from its back flange (abutment portion 19), Adams is silent about the size of that space. It would have been obvious to a POSITA to adjust the sizing of the space defined between Adams's abutment portion 19 and the edge of base 14 to a size sufficient to accommodate two layers of 5/8" drywall

for fire resistance, as taught by Bundy. Specifically, Bundy discloses sizing an extension portion of an analogous hanger to receive two 5/8"-thick-layers of drywall between its channel-shaped portion and the front face 6 of the wall's support member 4. *Id.*, ¶¶234-235; EX1007, 5:16-18. Two 5/8" thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶235.



EX1040, FIG. 2;



EX1007, FIG. 1.

Given that Adams's hanger is intended for securing its base 14 "away from the supporting element 17" of a "timber" wall, a POSITA would have been motivated to receive drywall in the space between Adams's base 14 and abutment portion 19. EX1003, ¶236. Bundy teaches receiving drywall between a hanger's channel-shaped portion and the front surface of a top plate to shield a frame wall, and advantages for accommodating two layers of 5/8" drywall between a wall

frame and a structural member held by a hanger for fire resistance in a fire separation wall. EX1007, 2:10–24. EX1003, ¶236. Given Bundy’s teachings, a POSITA would have optimized the size of the spacing between Adams’s base 14 and abutment portion 19 (i.e., the spacing provided by the inclined portions of sidewalls 15) to accommodate two layers of 5/8”-thick drywall according to the size preference described by Bundy for optimal fire protection and wall integrity. EX1003, ¶236; EX1007, 5:10-22. This modification to Adams would have been nothing more than applying a known technique (Bundy’s spacing a hanger seat from a wall frame by a distance sufficient to accommodate two 5/8”-thick drywall sheets for fire resistance) to a similar device (Adams’s hanger having a spacing of indeterminate length) to obtain the predictable result of a firewall hanger having a space between Adam’s base 14 and abutment portion 19 large enough for receiving the fire-resistant drywall therebetween, thereby “protect[ing] the structural members of a building.” EX1007, 5:18-20; EX1003, ¶236.

A POSITA would have had an expectation of success in modifying Adams’s hanger 10 to include a space large enough to receive two layers of 5/8” thick drywall between its base 14 and abutment portion 19, because doing so would still allow Adams’s hanger to perform its intended function of securing a joist to a wall. EX1040, 4:13–19; EX1003, ¶237. Recognizing that Adams’s and Bundy’s hangers are constructed from sheet metal blanks, a POSITA would have understood how to

modify the size of Adams's sidewalls 15 to accommodate two layers of 5/8" drywall while still allowing Adams's hanger to secure a joist's end to a frame wall. EX1003, ¶237; EX1007, 4:47-51; EX1040, 3:55–58. Doing so would have been well within the level of ordinary skill in the art at the time of invention. EX1003, ¶237.

B. Independent Claim 1

[1.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

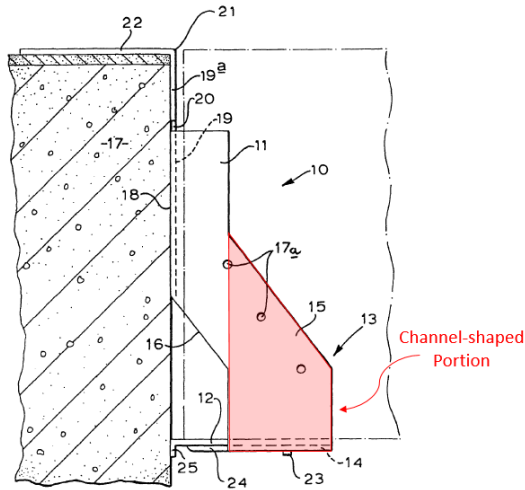
As discussed above for Yamaguchi and Cullen, the preamble of claim 1 is not limiting because claim 1's body recites a structurally complete invention and uses the preamble only to state a purpose or intended use. EX1003, ¶238.

To the extent that the preamble is limiting, the Adams-Bundy combination renders obvious such a hanger. EX1003, ¶239. Adams explicitly discloses using hanger 10 for timber building construction, but not explicitly for a wall adapted to have two-layers of 5/8-inch-thick drywall mounted thereon. EX1040, 1:1-8. As discussed above in §VIII.A., a POSITA would have understood that Adams's hanger would be applicable to a wall covered with two such layers of drywall for fire resistance, as taught by Bundy, and that Adams's sidewalls would be sized to accommodate two such layers of drywall between its back flanges and channel-shaped portion. EX1003, ¶239; EX1007, 2:37-41. A POSITA would have also

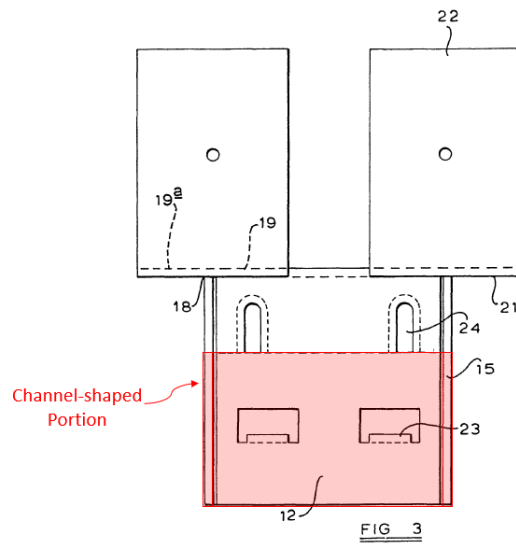
understood that Adam's hanger is configured to secure to a top plate of a frame wall by connecting Adam's hanger thereto when supporting element 17 is a timber wall. EX1003, ¶239. Accordingly, it would have been obvious to a POSITA to use Adams's hanger as modified by Bundy to connect a structural component to a top plate of a frame wall adapted to have the requisite drywall mounted thereon. *Id.* Such a modification would have been simply applying a known technique (Bundy's use of a hanger on a frame wall with two layers of 5/8" drywall to create a fire separation wall) to a known device (Adam's hanger having a space of unknown dimension between its base 14 and abutment portion 19) to obtain the predictable result of optimizing the size of the hanger's spacing to receive two 5/8"-thick layers of drywall therein, thereby shielding wall structures from fire. *Id.*; *see, e.g.*, EX1007, 5:18-19. A POSITA would have had an expectation of success in using Adam's hanger with a drywall-covered wall because Bundy's and Adam's hangers serve similar purposes—supporting a floor joist/structural beam at a top end of a wall. EX1003, ¶¶240-241.

[1.1] “a channel-shaped portion configured to receive the structural component,”

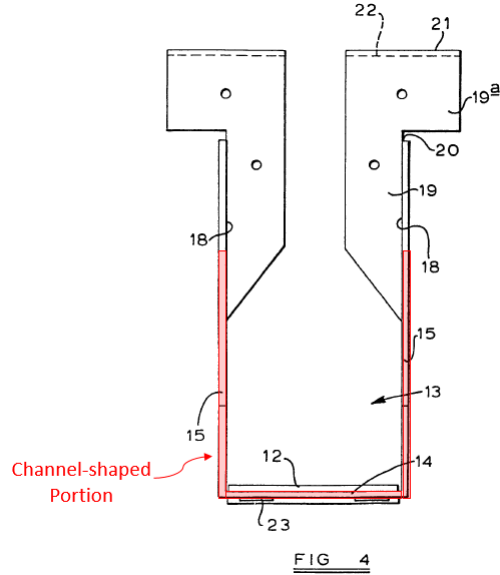
Adams discloses a channel shaped portion (e.g., base 14 and portions of sidewalls 15 thereabove) configured to receive the structural component (e.g., structural beam). EX1003, ¶¶243-244; EX1040, 4:2-5, FIGS. 2-4.



EX1040, FIG. 2 (annotated).



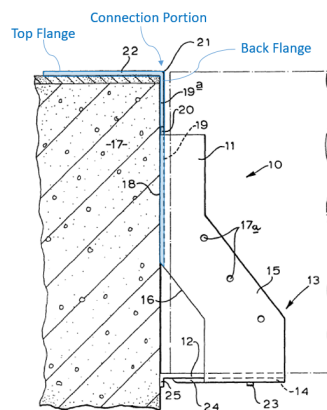
EX1040, FIG. 3 (annotated).



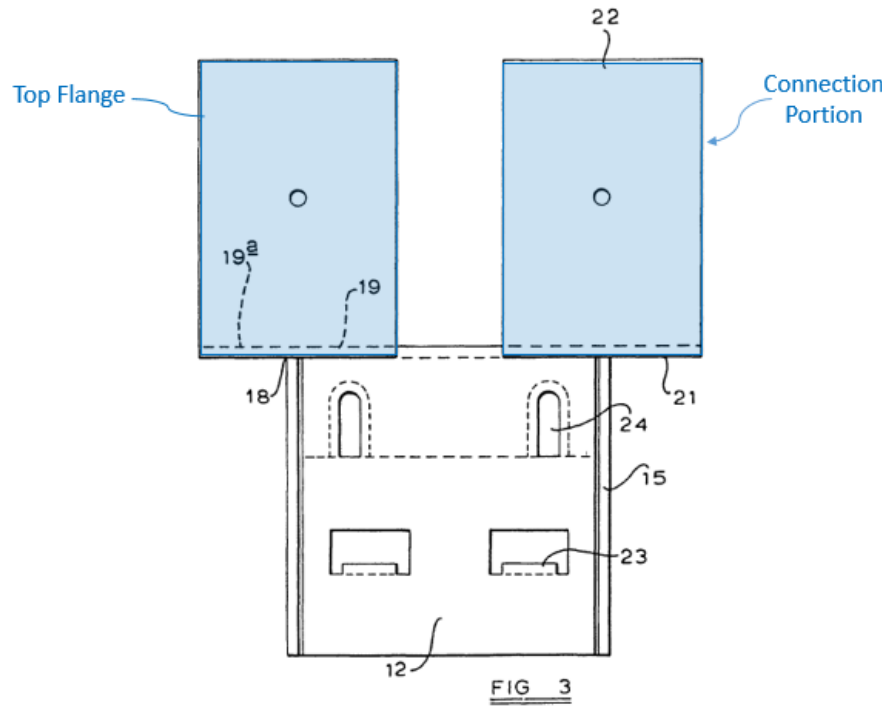
EX1040, FIG. 4 (annotated).

[1.2.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

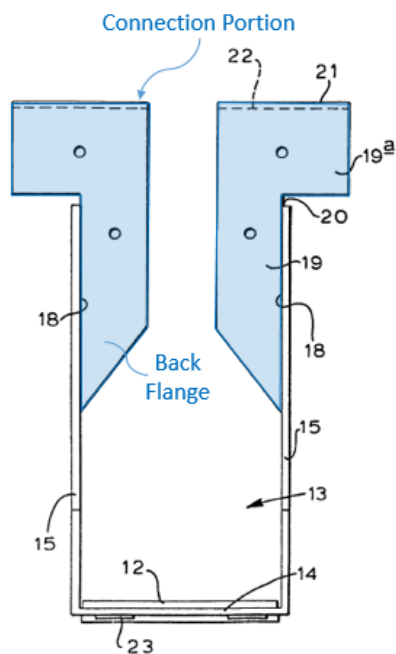
Adams discloses a connection portion that includes a top flange (bearing portion 22) arranged to engage a top surface of a top plate of the frame (timber wall (support element 17), as taught by Bundy. EX1003, ¶¶245-246; EX1040, 4:34-41, FIGS. 2-4.



EX1040, FIG. 2 (annotated).



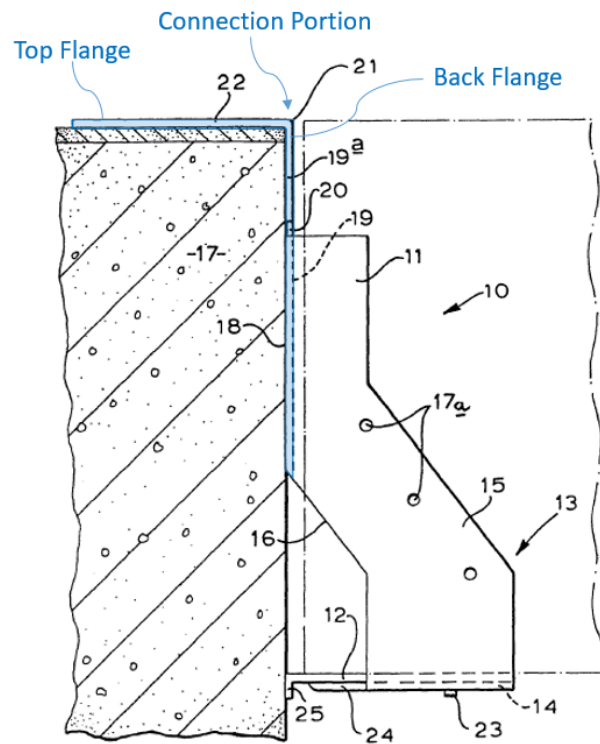
EX1040, FIG. 3 (annotated).



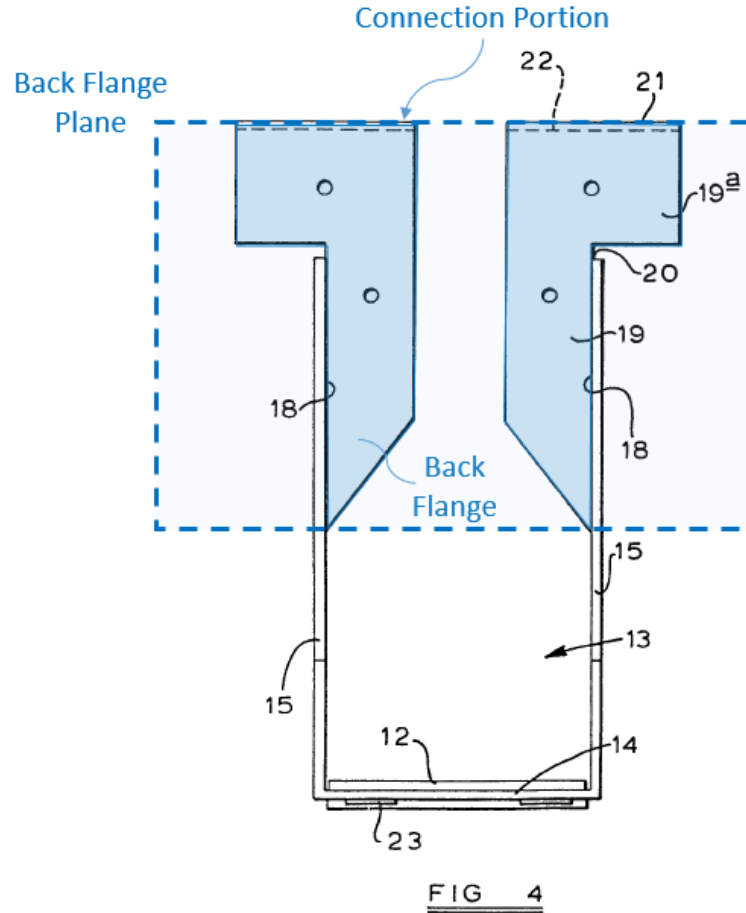
EX1040, FIG. 4 (annotated).

[1.2.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

Adams discloses a back flange (abutment portion 19) extending from an edge (fold line 21) of the top flange (bearing portion 22) and arranged to engage a vertical face of the top plate of the frame wall (“lies against the forward face of the supporting element 17”). EX1003, ¶247; EX1040, 4:22-36, FIGS. 2-3. Adams’s abutment portion 19 has a front surface lying in a back flange plane, as shown below. EX1003, ¶¶247-248; EX1040, FIGS. 2-3.



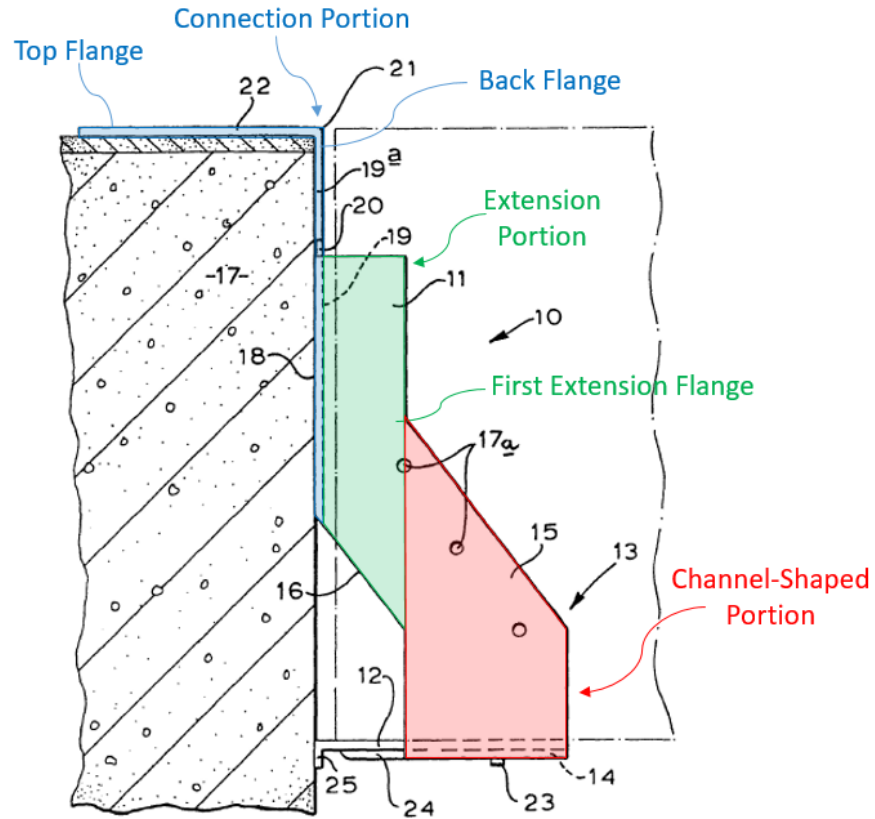
EX1040, FIG. 2 (annotated).



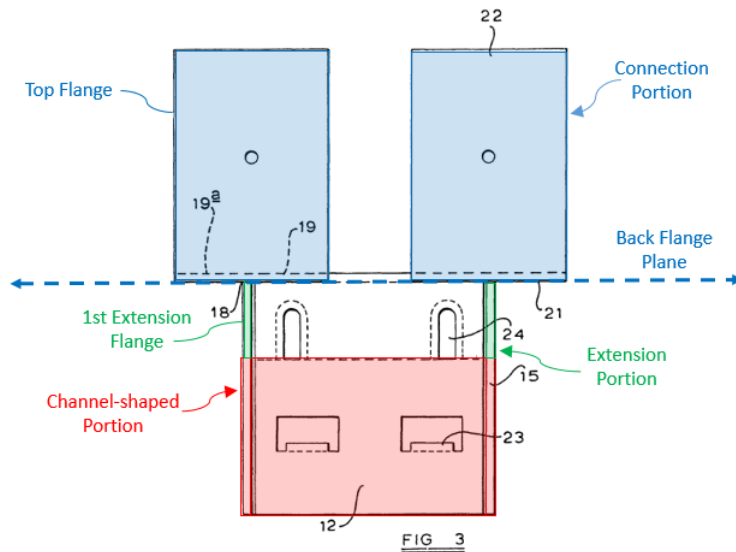
EX1040, FIG. 4 (annotated).

[1.3.A] “an extension portion including a first extension flange extending from the back flange of the connection portion to the channel-shaped portion;”

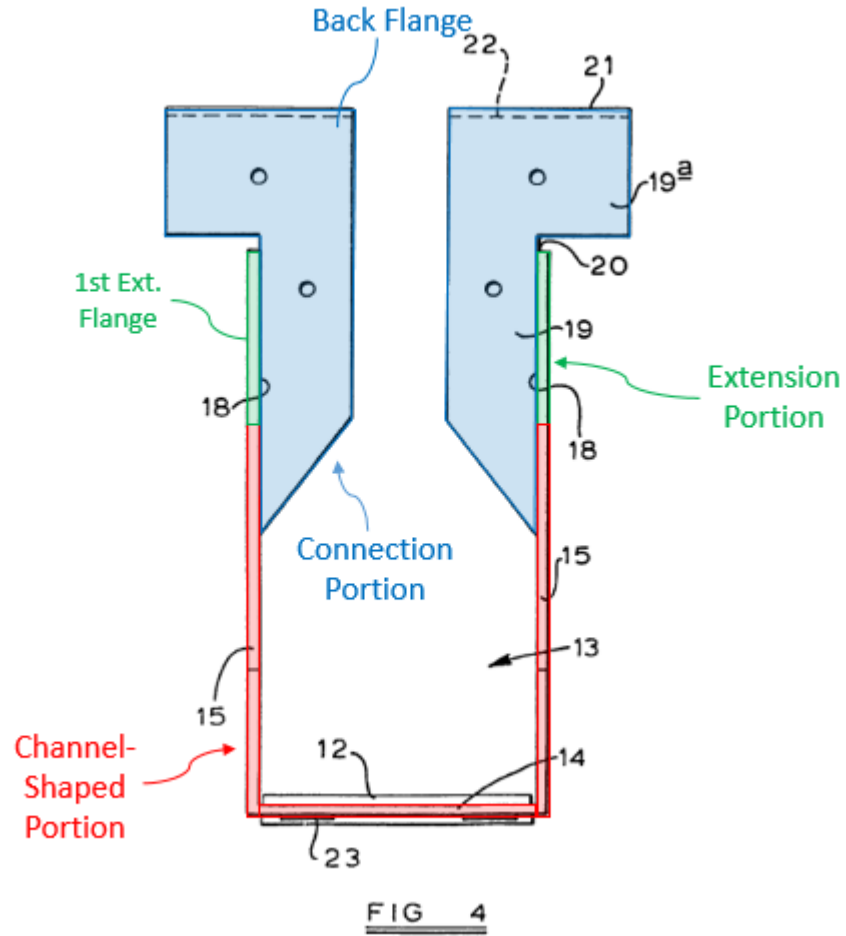
Adams discloses an extension portion (section of sidewalls 15 above edge 16) including a first extension flange (first sidewall 15 above edge 16) extending from the back flange (abutment portion 19) of the connection portion to the channel-shaped portion (base 14 and portions of sidewall 15 thereabove), as shown in green below. EX1003, ¶249; EX1040, 4:11-25, FIGS. 2-3.



EX1040, FIG. 2 (annotated).



EX1040, FIG. 3 (annotated).

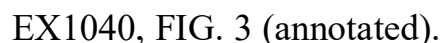


EX1040, FIG. 4 (annotated).

As Adams's extension portion is formed from the same piece of sheet metal as the back flange of its connection portion with no intervening components therebetween, Adams's extension portion extends from its connection portion.

EX1003, ¶250.

Adam's sidewalls 15 define a space that would permit drywall to be inserted between the surface of abutment portion 19 and base 14. EX1003, ¶251. While Adams does not explicitly disclose installing two layers of 5/8"-thick drywall between the surface of abutment portion 19 and base 14, a POSITA would have found it obvious to size the length of Adams's sidewalls 15 to define a space for receiving two layers of 5/8-inch-thick drywall therein based on Bundy. *See*, §VIII.A. above, EX1003, ¶251. Bundy teaches installing two layers of 5/8" sheathing between a hanger's channel shaped portion (Bundy's side members 11) and a wall frame. EX1007, 5:18-20; EX1003, ¶251.



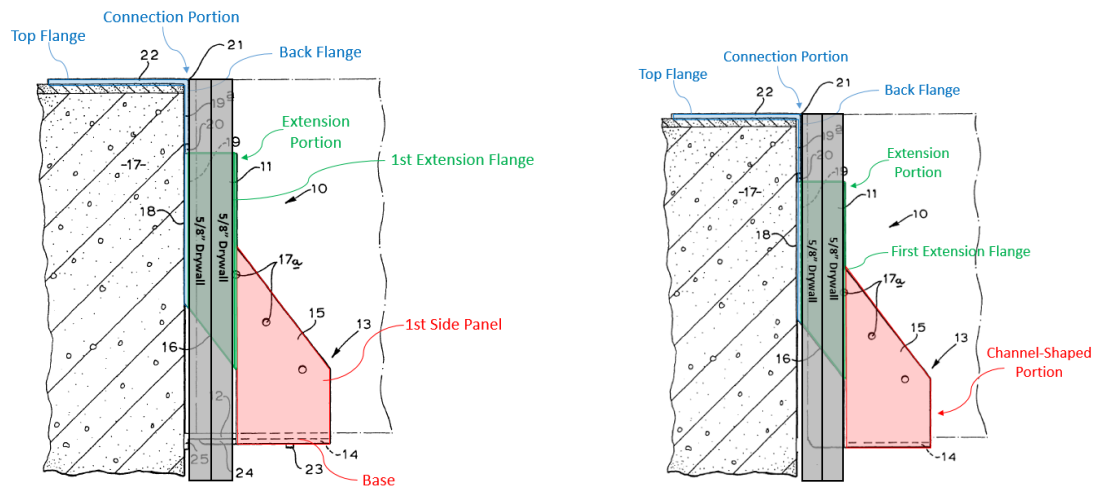
A POSITA would have had an expectation of success in defining a specifically-sized space between the surface of Adams's abutment portion 19 and base 14 large enough to accommodate two layers of 5/8" drywall, because Adams's and Bundy's hangers are used for similar purposes (e.g., hanging a joist to a wall) and Adams's abutment portion 19 and base 14 already define a space therebetween. EX1003, ¶252; EX1007, 4:46-51; EX1040, 4:2-25. Adams describes that hanger 10 may be used with an "optional shoe plate 12" extending from base 14 to the front surface of supporting element 17. EX1040, 3:58-4:1, 4:46-58, 5:45-46. One option for a POSITA would be to use Adams's hanger with its optional shoe plate such that fire-resistant material (e.g., drywall, wool, etc.) is received in the gap between sidewalls 15 and abutment portion 19. EX1003, ¶252. For example, a POSITA would have understood to add two layers of 5/8" drywall to the Adams-Bundy hanger under shoe plate 12 and around sidewalls 15, along with an insert of two layers of 5/8" drywall above shoe plate 12 and between sidewalls 15.

Alternatively, given that shoe plate 12 is "optional," a POSITA would have been motivated to remove shoe plate 12 to provide a single-piece hanger. EX1003, ¶253; EX1040, 3:57-4:1. In doing so, a POSITA would have understood to construct Adams's hanger from a sufficiently-sized metal sheet to counter any moment forces. A POSITA would have also understood that receiving drywall

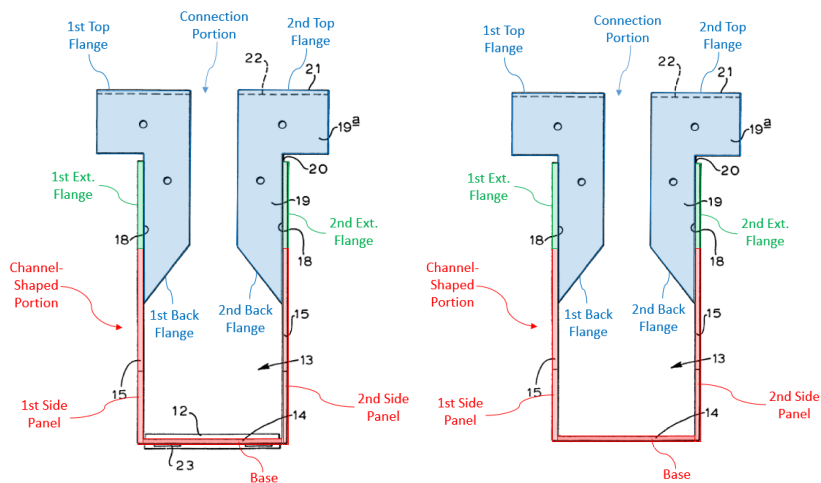
between base 14 and supporting element 17, as taught by Bundy, would allow the base's rear edge to abut drywall, rather than hang without any support, thereby allowing Adams's hanger to counter any moment forces by the received joist.

EX1003, ¶253. Thus, a POSITA would have had a reasonable expectation of success in removing shoe plate 12 from hanger 10, while still keeping the base's rear edge separated from supporting element 17 to receive drywall therebetween.

EX1003, ¶¶253-254.



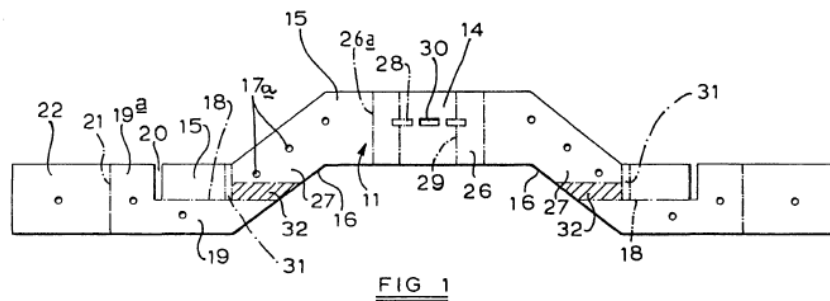
EX1040, FIG. 2 (annotated, rendering without shoe plate)



EX1040, FIG. 4 (annotated, rendering without shoe plate).

[1.4] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

Adams discloses the channel-shaped portion (base 14 and portions of sidewall 15 thereabove), the extension portion (portions of sidewall 15 above edge 16) and the connection portion (abutment and bearing portions 19, 22) are formed from a single sheet metal blank, and thus are rigidly fixed with respect to one another once bent into shape. EX1003, ¶¶255-257; EX1040, 3:55-58; 5:38-44.



EX1040, FIG. 1.

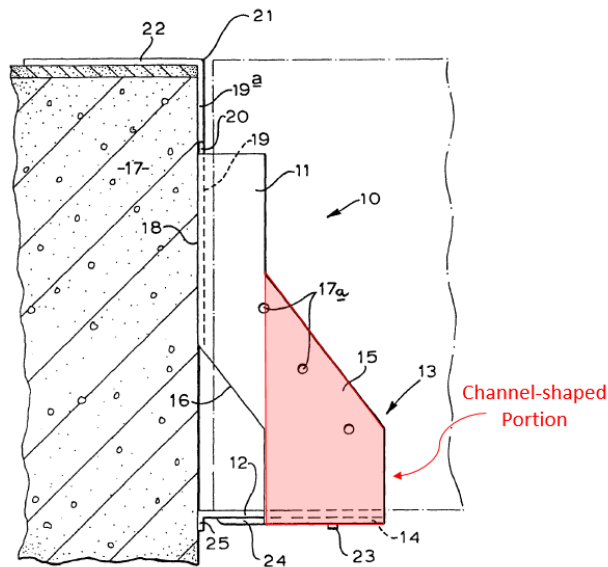
C. Independent Claim 53

[53.P] “A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,”

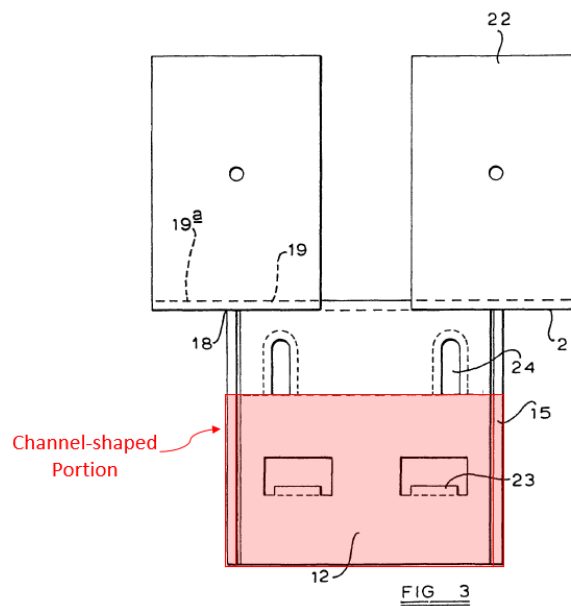
As discussed above with respect to claim 1, element [1.P], the Adams–Bundy combination renders obvious this limitation. EX1003, ¶258.

[53.1] “a channel-shaped portion configured to receive the structural component,”

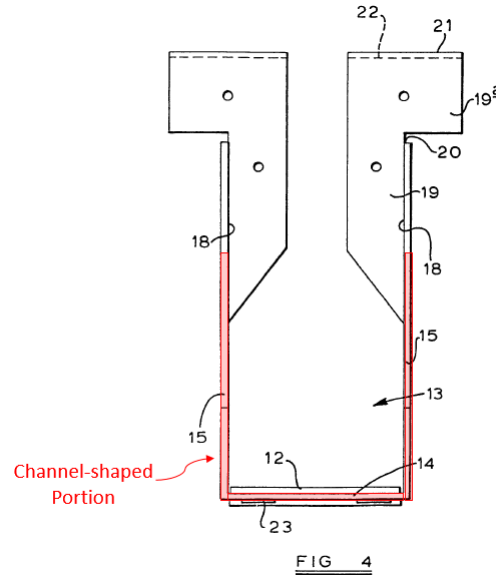
As discussed with respect to claim 1, element [1.1.A], Adams discloses this limitation. EX1003, ¶259; EX1035, 3:23-55, FIGS. 5-7.



EX1040, FIG. 2 (annotated).



EX1040, FIG. 3.

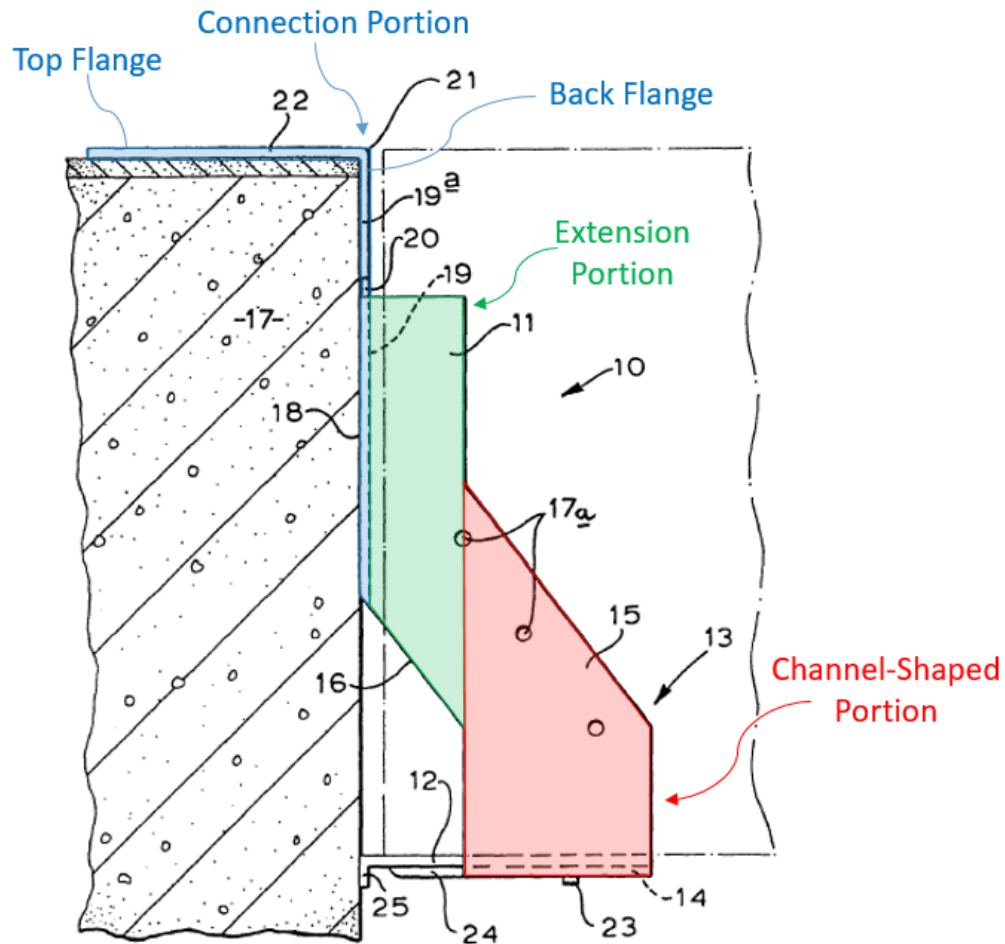


EX1040, FIG. 4 (annotated).

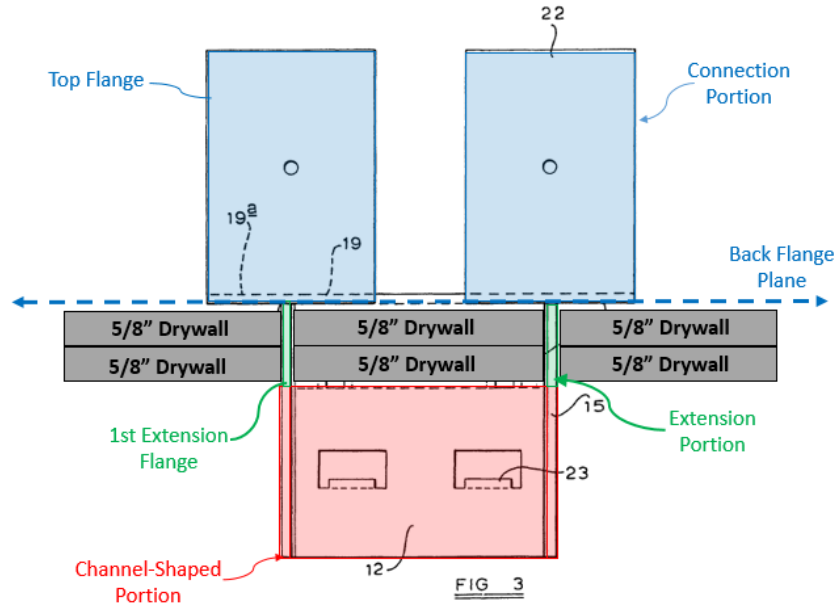
[53.2] “an extension portion extending from the channel-shaped portion and configured to extend through the two layers of 5/8-inch-thick drywall;”

As Adams’s extension portion (section of sidewalls 15 above edge 16) is formed from the same piece of sheet metal as the channel-shaped portion (base 14 and portions of sidewall 15 thereabove) with no intervening components therebetween, Adams’s extension portion extends from its channel-shaped portion. EX1003, ¶260; EX1040, 4:11-25. While Adams does not explicitly disclose extending sidewalls 15 through drywall, a POSITA would have been motivated to size Adam’s sidewalls so as to receive two layers of 5/8”-thick drywall between abutment portion 19 and base 14, as taught by Bundy and discussed above in §VIII.A. EX1003, ¶261; EX1007, 5:18-20. When modified as such, a POSITA would have understood that sidewalls 15 of the Adams-Bundy combination are

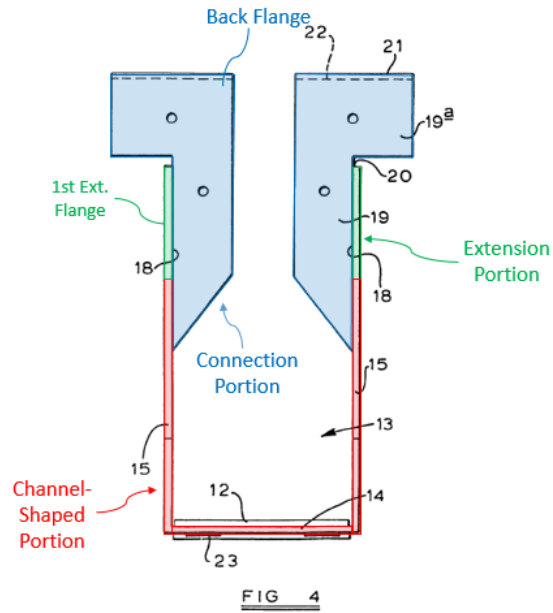
configured to extend into one side and out the other side of drywall because the sidewalls 15 are flat sheet metal extending continuously from base 14 to abutment portion 19 when drywall is installed therebetween, just like the extension flanges described in the '626 patent. EX1003, ¶261. Thus, Adams's sidewalls 15 are configured to extend through the two layers of 5/8"-thick drywall. EX1003, ¶¶261-262.



EX1040, FIG. 2 (annotated).



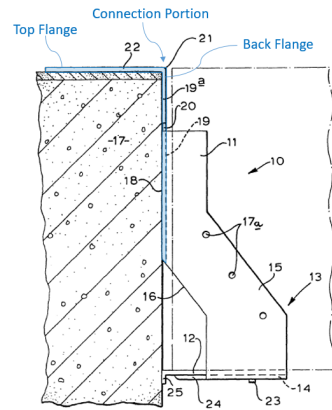
EX1040, FIG. 3 (annotated).



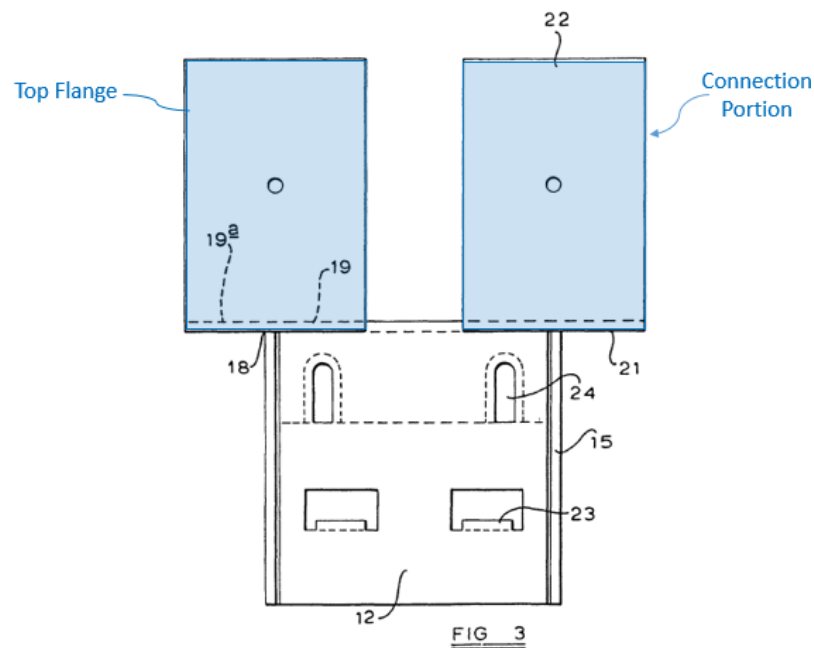
EX1040, FIG. 4 (annotated).

[53.3.A] “a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,”

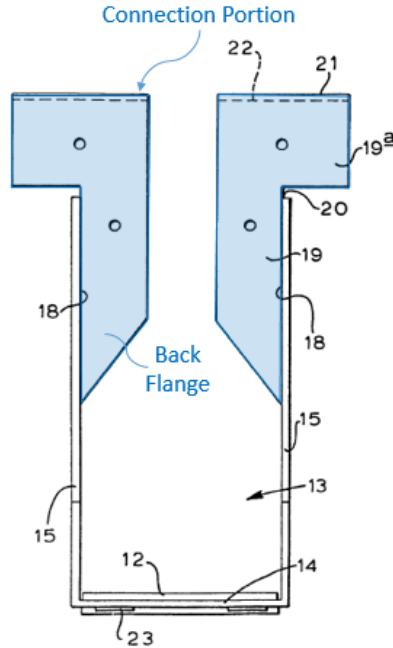
As discussed above with respect to claim 1, element [1.2.A], Adams-Bundy discloses this limitation. EX1003, ¶263; EX1035, 3:23-55, FIGS. 5-7.



EX1040, FIG. 2 (annotated).



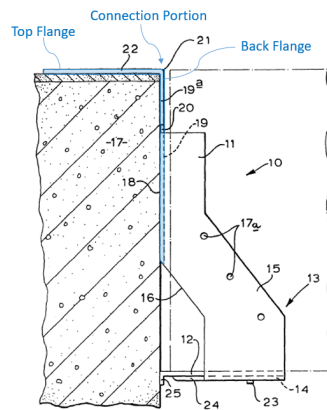
EX1040, FIG. 3 (annotated).



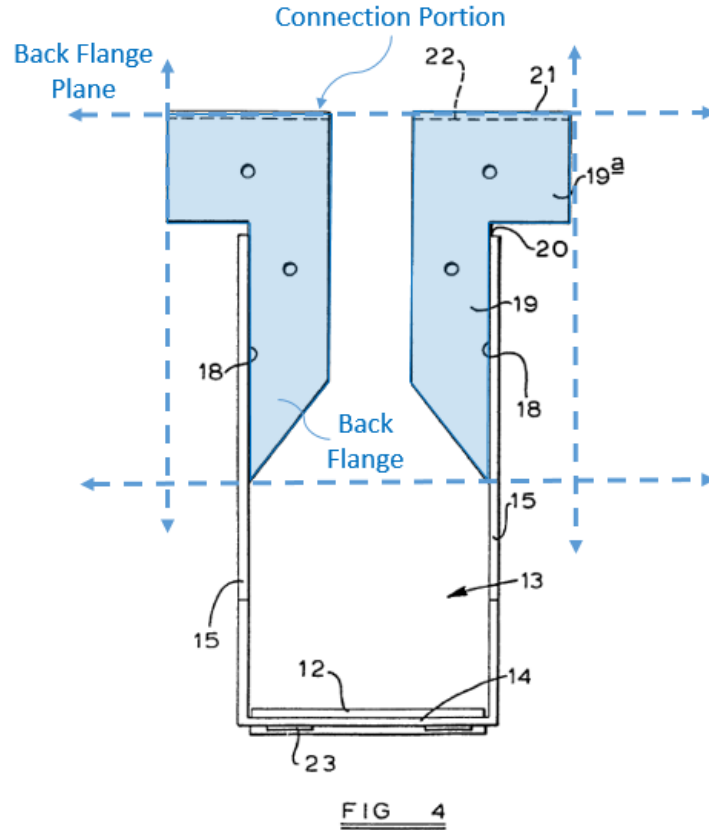
EX1040, FIG. 4 (annotated).

[53.3.B] “a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,”

As discussed above with respect to claim 1, element [1.2.B], Adams-Bundy renders obvious this limitation. EX1003, ¶264.



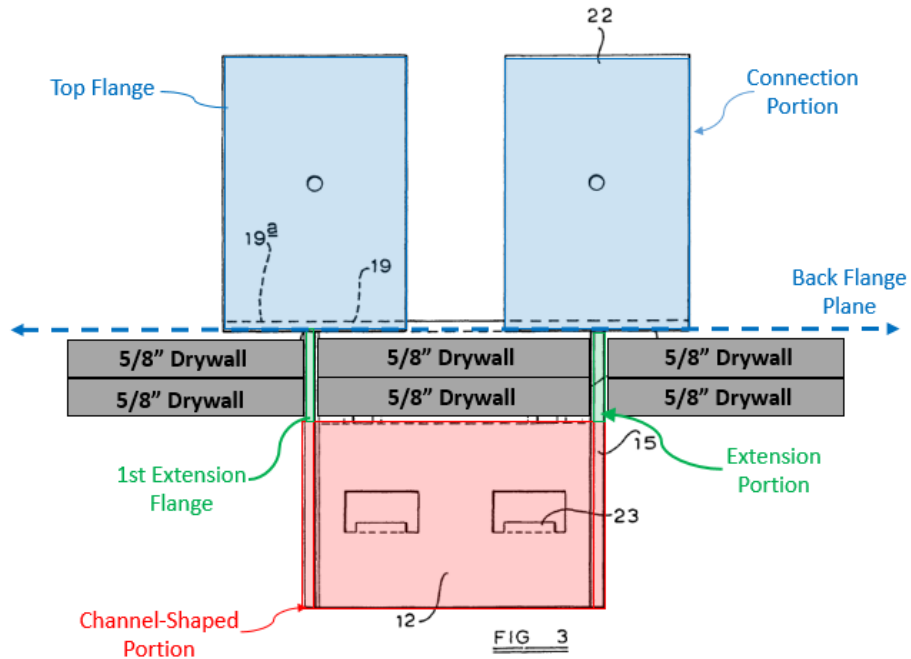
EX1040, FIG. 2 (annotated).



EX1040, FIG. 4 (annotated).

[53.4] “the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane”

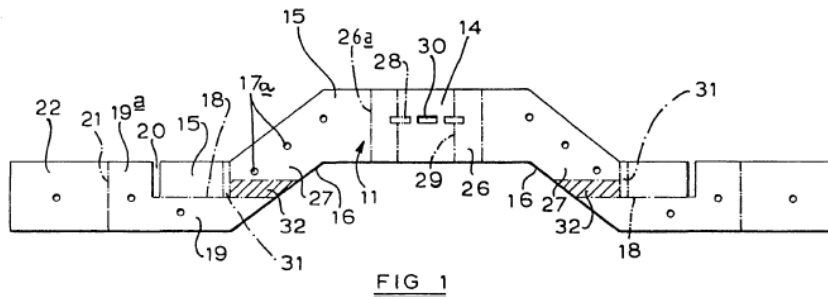
As discussed above with respect to claim 1, element [1.3.B], the Adams-Bundy combination renders obvious this limitation. EX1003, ¶265; EX1035, 3:23-55, FIGS. 5-7.



EX1040, FIG. 3 (annotated).

[53.5] “wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another”

As discussed above with respect to claim 1, element [1.4], Adams discloses this limitation. EX1003, ¶266.



EX1040, FIG. 1.

D. Claims 9, 13, and 61–62

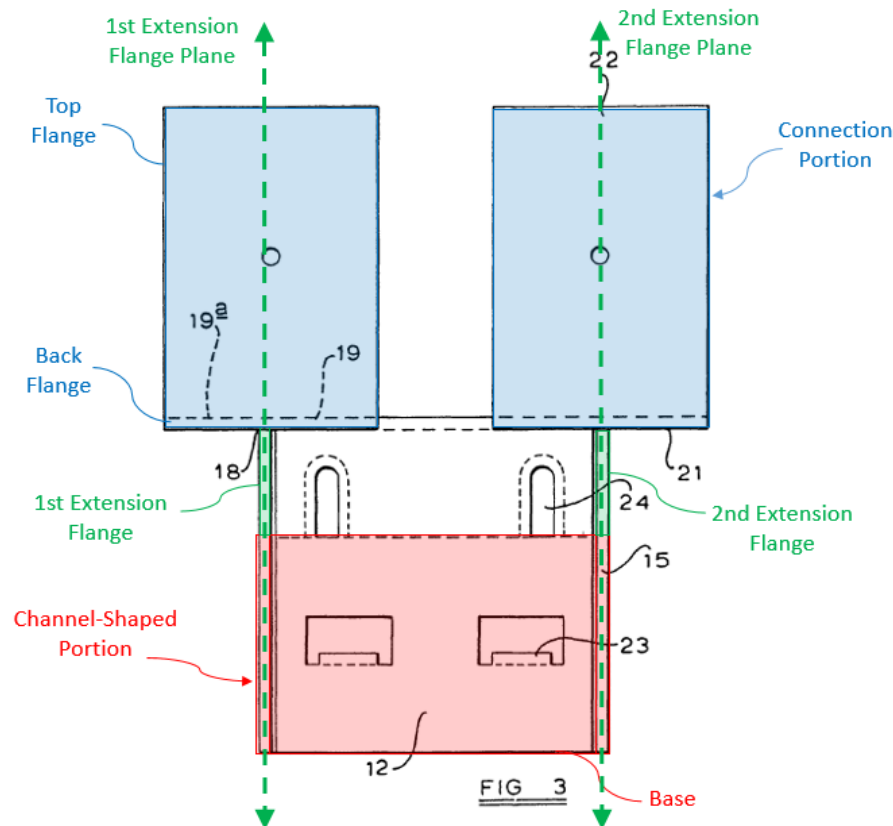
As discussed in sections [1.3.A] and [53.2], Adams discloses that its two extension flanges are each directly connected to both its channel-shaped portion and its connection portion. Adams thus discloses the extension portion including both a first extension flange and a second extension flange (the portion of each sidewall 15 above respective edges 16) extending from the connection portion (abutment portion 19) to the channel-shaped portion (base 14 and portions of sidewalls 15 thereabove) (and vice versa, from the channel-shaped portion to the connection portion). EX1040, 4:11-25, FIGS. 2-3; EX1003, ¶267.⁸

Adams further discloses that the first extension flange (left sidewall 15) is a flat element made of sheet metal, which has a surface lying in a first extension flange plane. EX1040, 3:55-4:1. For the same reasons as the first, the second extension flange lies in a second extension flange plane. Adams further illustrates that the surfaces of the sidewalls are parallel to each other, and thus the second extension flange and extension flange plane are parallel to the first extension

⁸ Due to the symmetry of the hanger disclosed in Adams, all features of one of the sidewalls 15 shown in FIG. 2 of Adams would also correspond to the other sidewall 15 located on the opposite side of Adams's hanger 10.

flange and extension flange plane, respectively, as shown below. EX1040, FIG. 3;

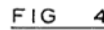
EX1003, ¶268.



EX1040, FIG. 3 (annotated).

Adams discloses the channel-shaped portion including a base (base 14) configured to receive and support the structural component's end portion and a channel-shaped portion including first and second side panels (section of sidewalls 15 defined above base 14). EX1040, 4:2-5; EX1003, ¶269. A POSITA would have understood, as the term “engage” is used in the '626 patent (EX1001, Abstract), that Adams's base 14 is arranged to engage the structural component because Adams's base 14 “form[s] a seating for a joist.” EX1040, 4:2–5. If Patent Owner

Being constructed from sheet metal (EX1040, 3:55-4:1), Adams's base includes an upper surface defining (and thus lying in) a horizontal base plane that is generally perpendicular to the vertical first and second extension flanges and extension flange planes, as shown below. EX1040, 4:2-5; EX1003, ¶¶270-271. EX1040, FIGS. 1-4.

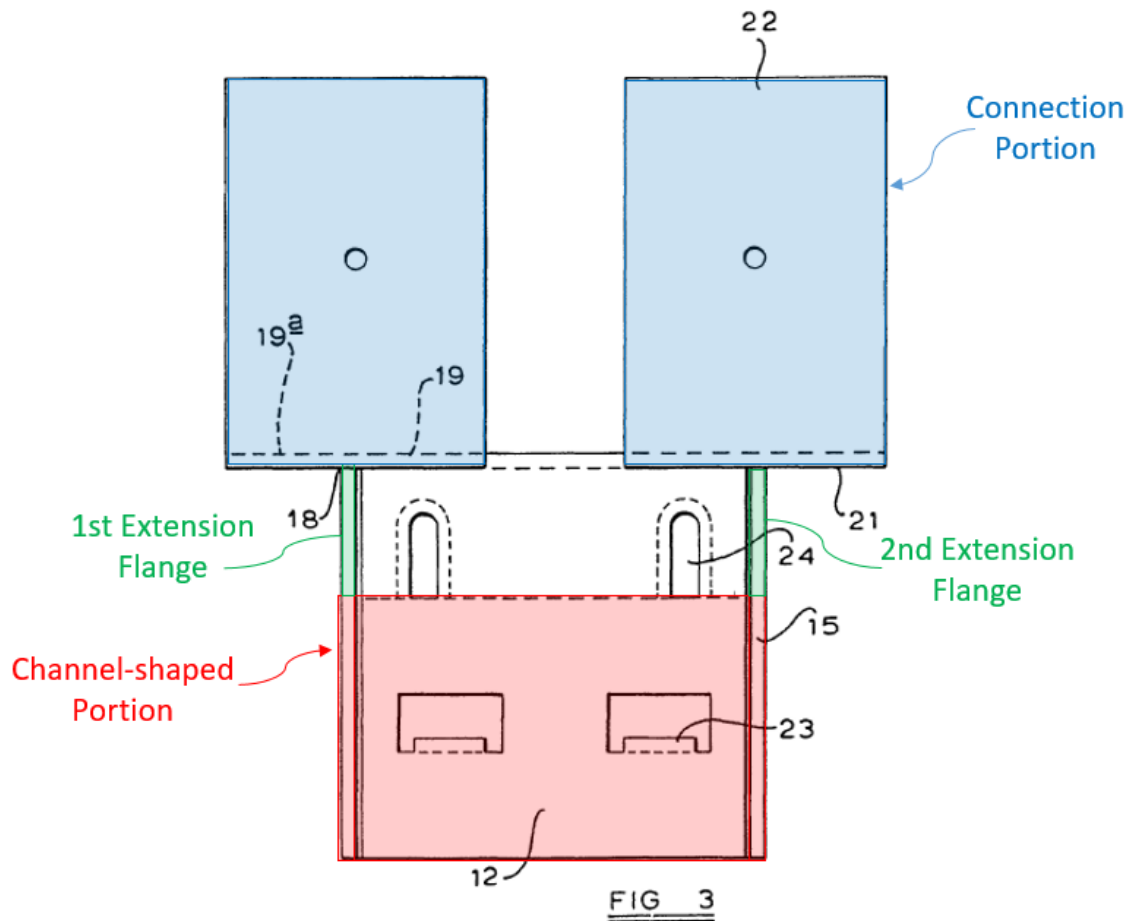


EX1040, FIG. 4 (annotated).

E. Claims 10 and 63

For similar reasons as discussed for claims 9, 13, and 61-62, Adams discloses first and second extension flanges (section of sidewalls 15 above edges 16) that are flat elements made from sheet metal, and thus generally planar.

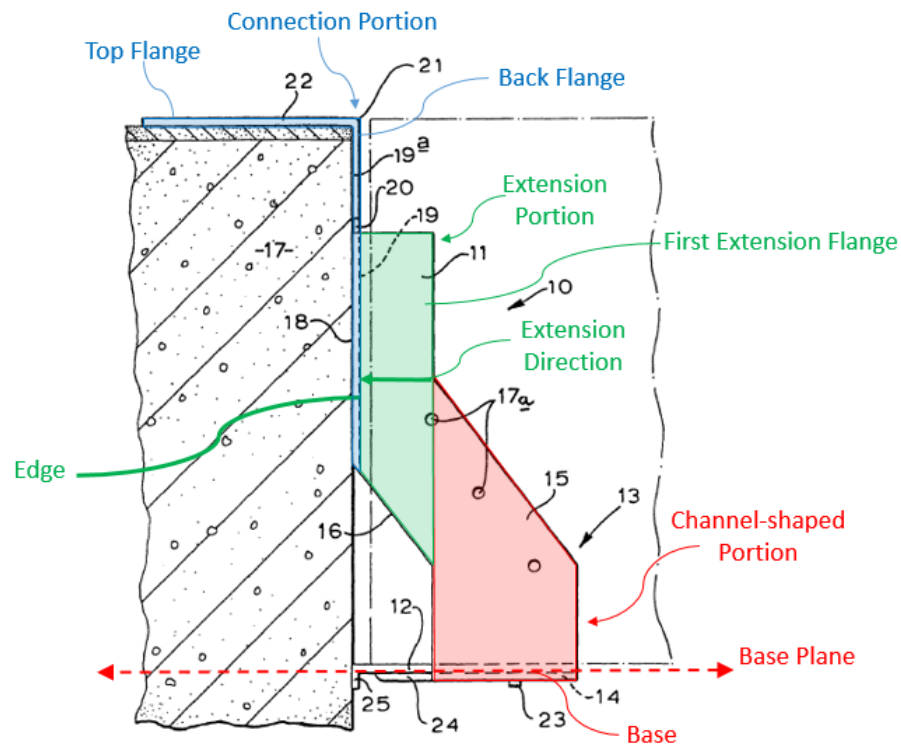
EX1003, ¶¶272-273; EX1040, 3:55-4:25.



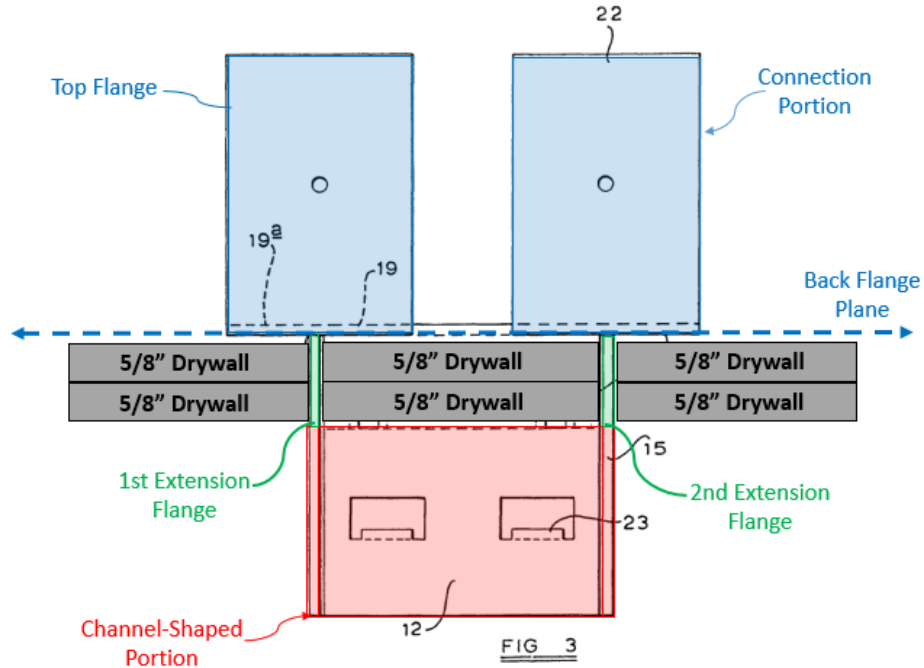
EX1040, FIG. 3 (annotated).

F. Claims 11 and 64

Adams discloses first and second extension flanges (section of sidewalls 15 above edges 16) each including an edge (i.e., where each extension flange joins the back flange), as shown below. EX1040, FIG. 2; EX1003, ¶274. When the teachings of Bundy are combined with Adams's hanger as discussed in §VIII.A., the resulting first and second extension flanges (section of sidewalls 15 above edges 16) each have a length sufficient to accommodate two layers of 5/8-inch-thick drywall and extend edgewise through the drywall when two layers of 5/8-inch-thick drywall are installed between the resulting hanger's abutment portion and base. EX1003, ¶¶274-275.



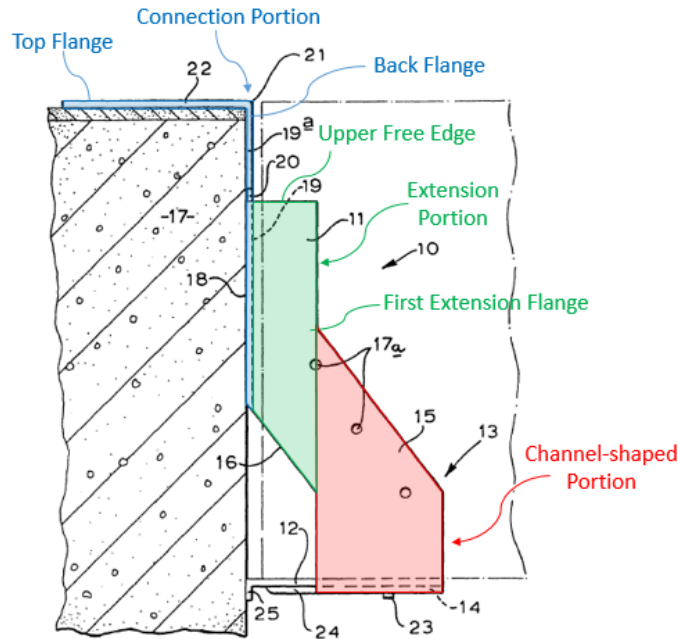
EX1040, FIG. 2 (annotated).



EX1040, FIG. 3 (annotated).

G. Claims 12 and 65

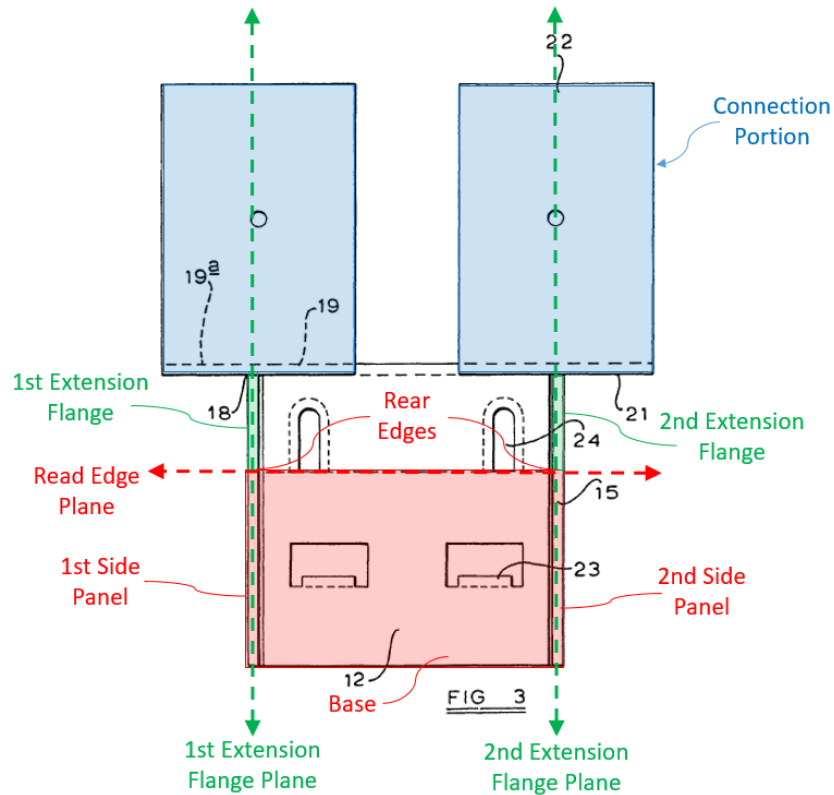
Adams discloses first and second extension flanges (section of sidewalls 15 above edges 16) each including an upper free edge, as shown below. EX1040, FIG. 2; EX1003, ¶276.



EX1040, FIG. 2 (annotated).

H. Claims 14 and 66

Adams discloses that the channel-shaped portion includes first and second side panels (section of sidewalls 15 defined above base 14) extending upward from the base (base 14). EX1040, 4:2-5; EX1003, ¶277. Each side panel has a vertical rear edge (e.g., as shown below the front end of edge 16), the two edges defining (and thus lying in) a rear edge plane. As the side panels are vertical and symmetrical, having symmetrical spacing between the back flange and the vertical rear edges, the rear edge plane is perpendicular to the first and second extension flanges and extension flange planes, as shown below. EX1040, FIG. 2; EX1003, ¶¶277-278.

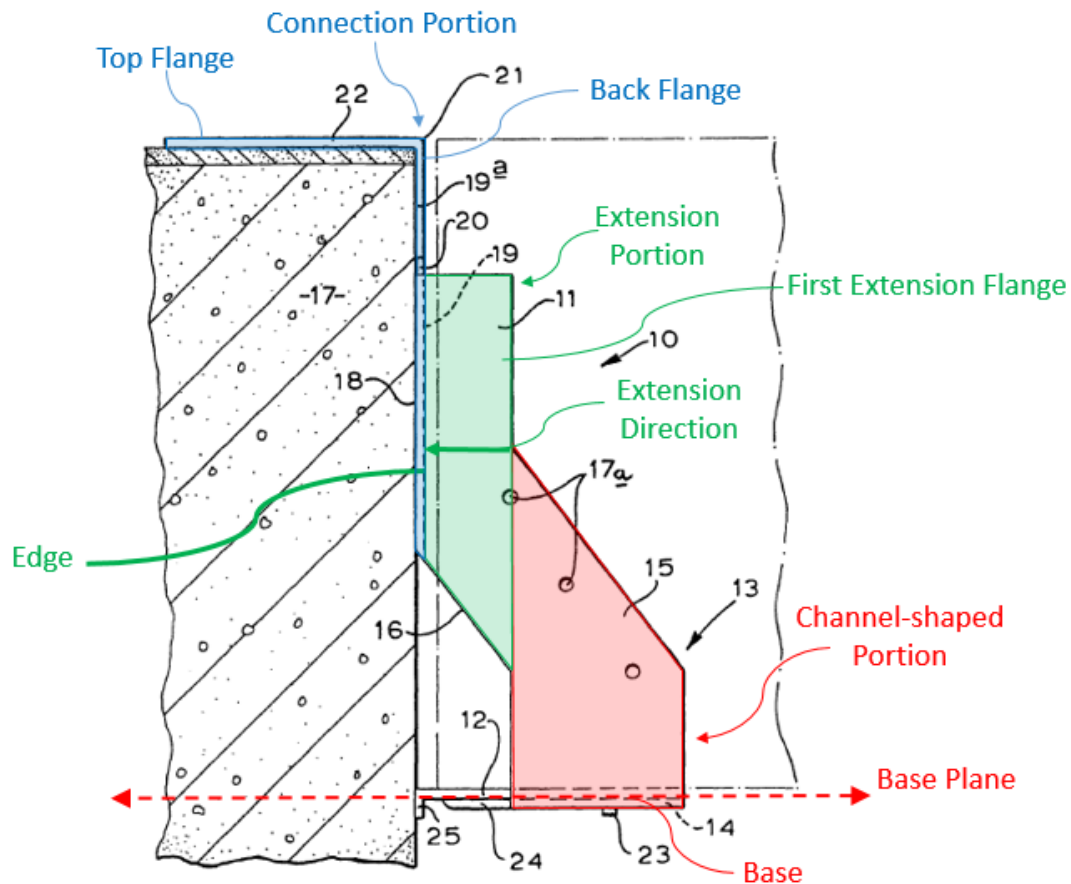


EX1040, FIG. 3 (annotated).

A. Claims 21 and 73

As discussed for claims 9 and 61, Adams discloses the channel-shaped portion including a base (base 14) configured to receive and support a structural component's end portion and having an upper surface arranged to engage the structural component and lying in a base plane. As discussed for claims 9, 13, and 61-62, Adams discloses the extension portion including both a first and second extension flange (the portion of each sidewall 15 above respective edges 16). Adams discloses that each of the first and second extension flanges (sections of sidewall 15 above edge 16) includes an edge (e.g., fold 18). There are no

intervening components between the channel-shaped portion and each extension flange, so each of the first and second extension flanges extends edgewise from the channel-shaped portion (stirrup part 13) toward the back flange (abutment portion 19) in an extension direction that is parallel to the base plane (i.e., horizontal), as shown below. EX1040, FIG. 2; EX1003, ¶¶279-280.

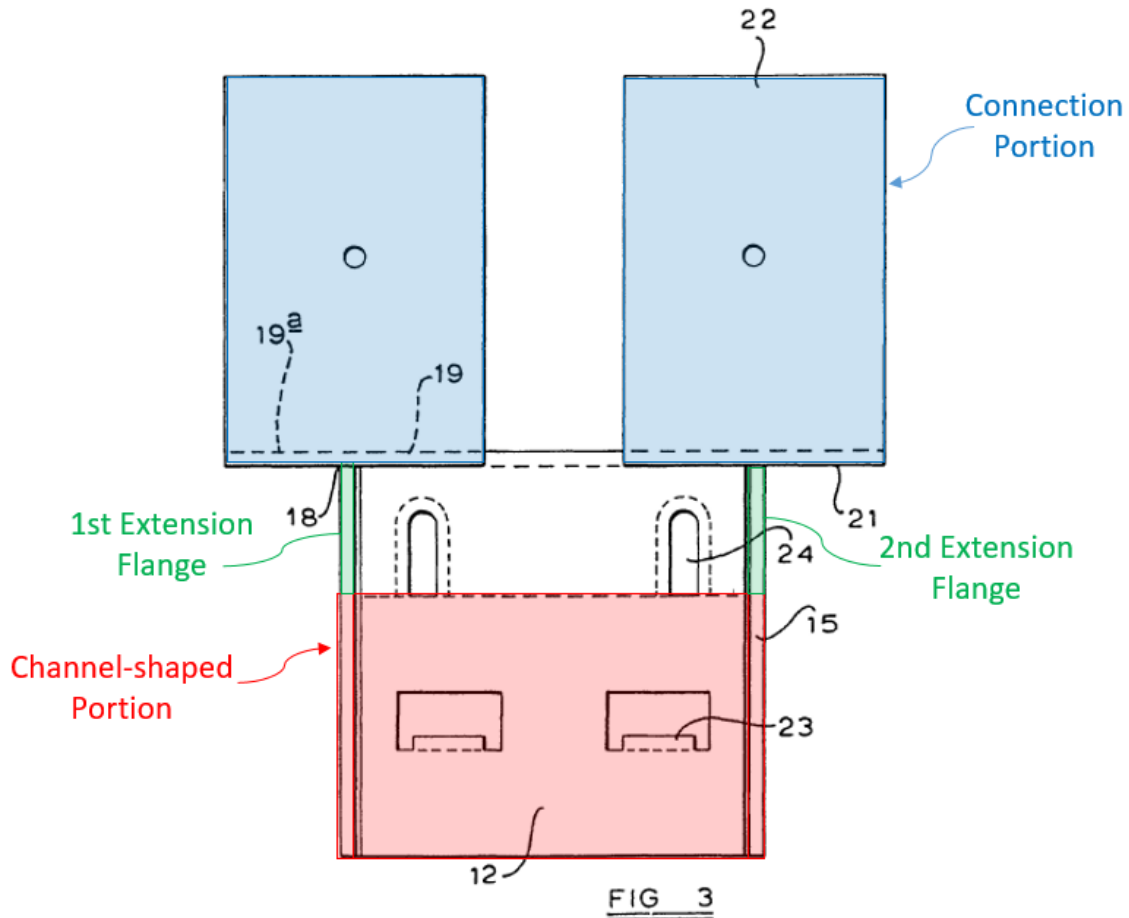


EX1040, FIG. 2 (annotated).

B. Claims 29 and 81

As discussed above with respect to claims 9, 13, and 61–62, Adams discloses first and second extension flanges (section of sidewalls 15 above edge

16) extending from the connection portion (abutment portion 19) to the channel-shaped portion (section of sidewalls 15 defined above base 14) (and vice versa, as recited in claim 81) and being parallel to one another. EX1040, 4:2–26, FIG. 2; EX1003, ¶¶281–282.



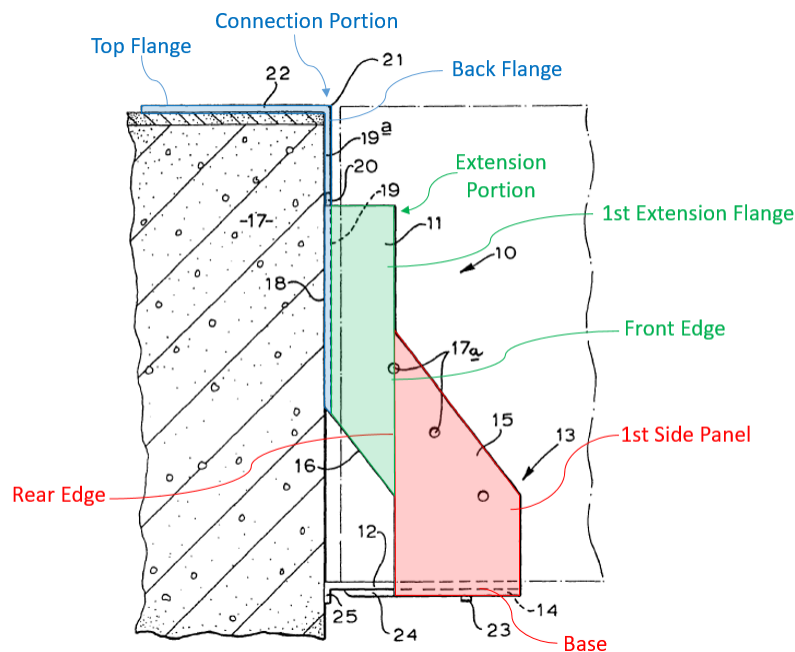
EX1040, FIG. 3 (annotated).

C. Claims 30 and 82

As discussed for claims 9, 13, and 61–62, Adams discloses that its extension portion includes both a first and second extension flange (the portion of each

sidewall 15 above respective edges 16) extending from the connection portion (abutment portion 19) to the channel-shaped portion (base 14 and portions of sidewalls 15 thereabove) (and vice versa). EX1003, ¶283.

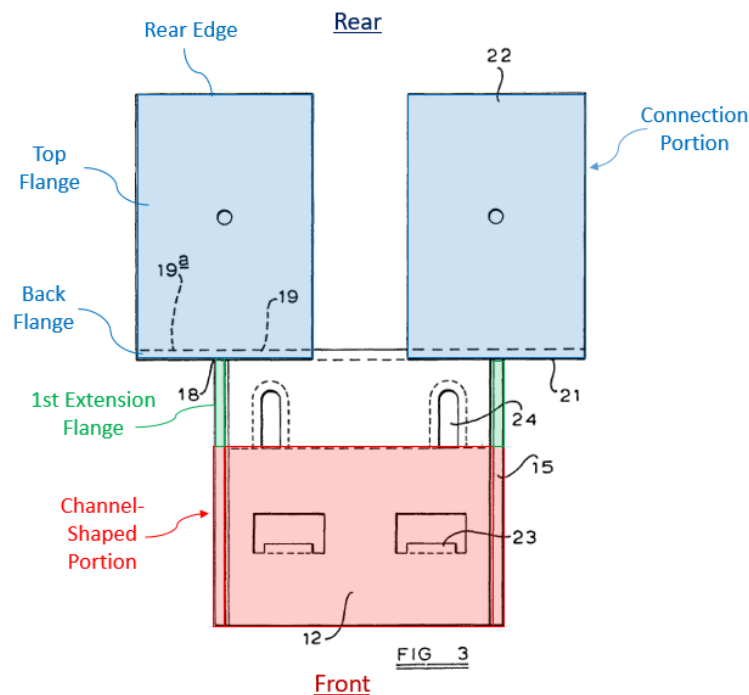
As discussed for claims 9, 14, 61, and 66, Adams discloses that the channel-shaped portion includes a base (base 14) configured to receive and support the structural component's end portion and a first side panel (section of first sidewall 15 above base 14) extending upward from the base. Adams further discloses a front edge of the first extension flange (section of sidewall 15 above edge 16) abutting a rear edge of the first side panel (section of sidewall 15 above base 14), as they join with no intervening structures therebetween (shown below). EX1040, FIG. 2; EX1003, ¶¶284-285.



EX1040, FIG. 2 (annotated).

D. Claims 32 and 84

Adams discloses that the top flange (bearing portion 22) includes a rear edge (annotated below) located rearwardly of the edge (fold line 21) of the top flange from which the back flange (abutment portion 19) extends, the rear edge located rearwardly of the back flange (abutment portion 19). EX1040, FIG. 3; EX1003, ¶¶286-287.

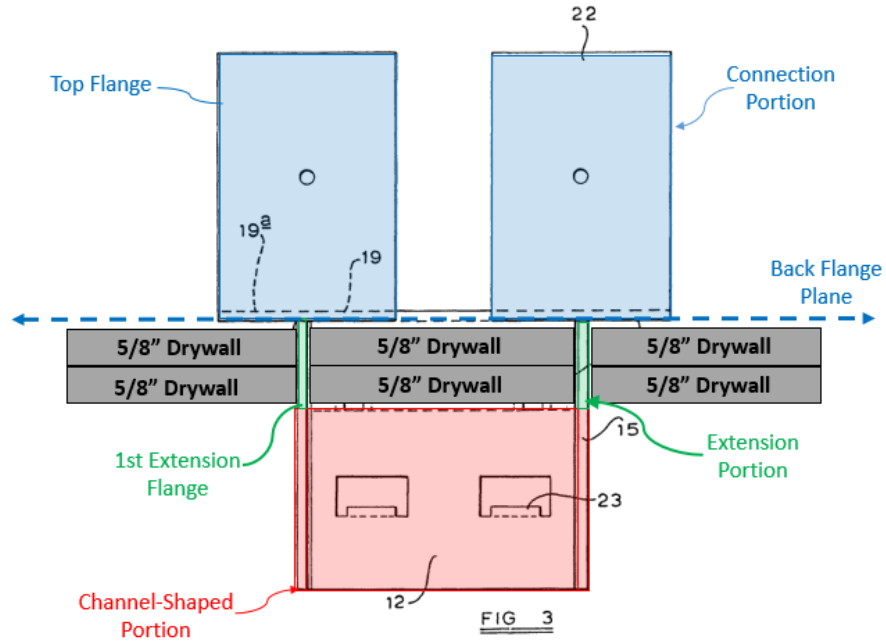


EX1040, FIG. 3 (annotated).

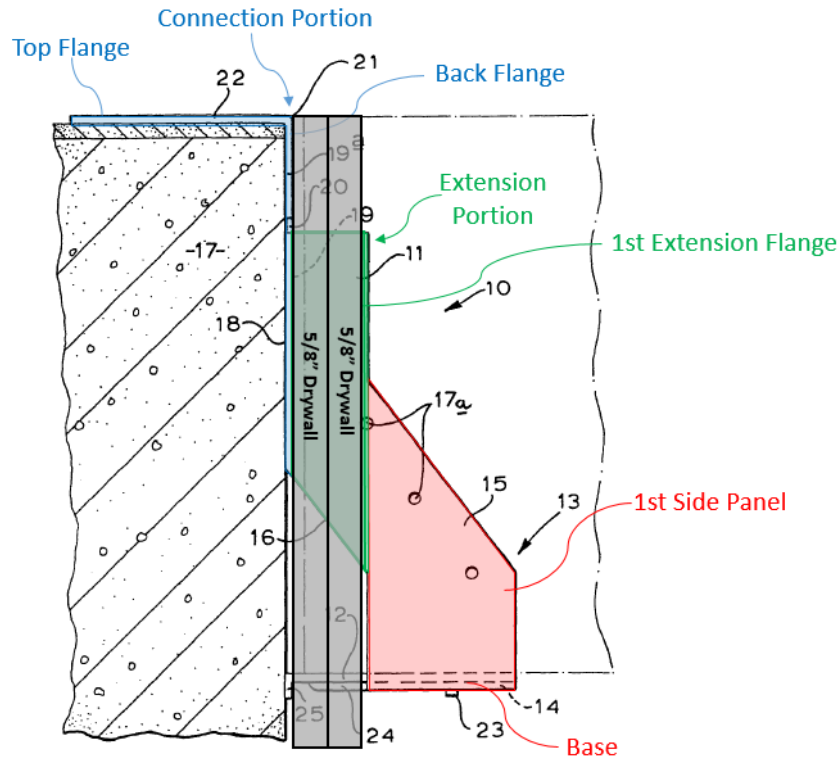
E. Claims 33-35 and 85-86

In employing the teachings of Bundy's drywall space with Adams's hanger 10, the Adams-Bundy combination renders obvious a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein. EX1007, 5:10–22. As discussed for claims 9, 13, 61, and 62, Adams discloses that the extension

portion includes a first extension flange and a second extension flange extending from the connection portion to the channel-shaped portion. For the reasons discussed in claim 1 and 53, a POSITA would have sought to modify the length of Adams's sidewalls 15 defined above edge 16 to a length sufficient to accommodate two sheets of 5/8-inch-thick drywall as taught by Bundy. This modification would have resulted in a drywall space sized and shaped to receive two layers of 5/8-inch-thick drywall between Adams's base 14 and abutment portion 19. As the channel-shaped portion (base 14 and portions of sidewalls 15 thereabove) and back flange plane (defined by the surface of abutment portion 19) of the Adams-Bundy combination define the drywall space's size and shape, they bound the drywall space. EX1040, FIG. 3; EX1007, 5:10-22; EX1003, ¶¶288-289. Because the first and second extension flanges of the Adams-Bundy combination further define the drywall space's size and shape, they also each bound the drywall space. *Id.*



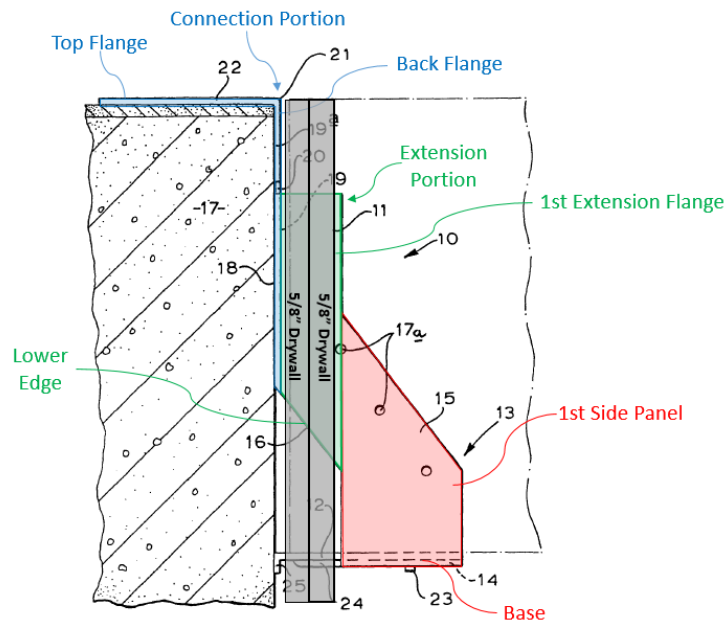
EX1040, FIG. 3 (annotated).



EX1040, FIG. 2 (annotated).

F. Claims 87 and 88

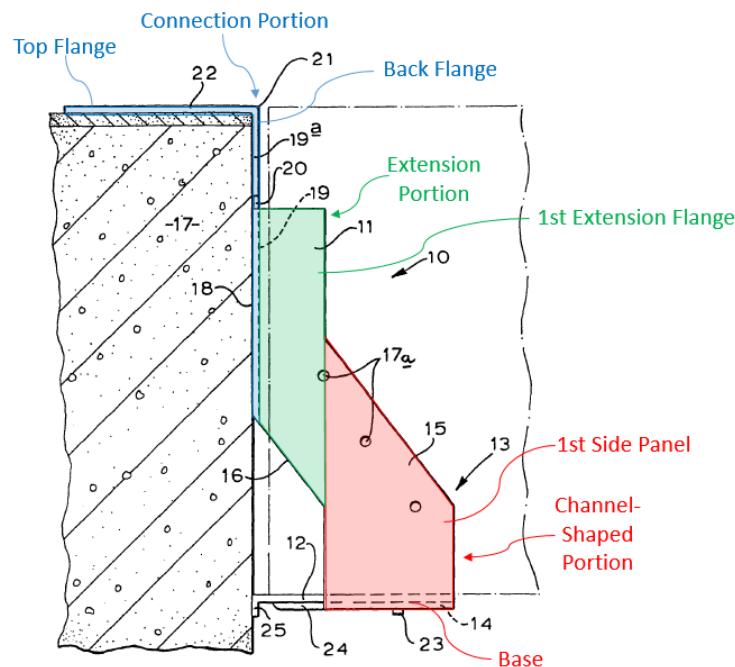
Adams discloses that the first and second extension flanges (sidewalls 15 above edge 16) include a lower edge (inclined edge 16). EX1040, 4:11–19; EX1003, ¶290. In employing the teachings of Bundy’s drywall spacing with Adams’s hanger 10 as discussed for claims 85-86, the Adams-Bundy combination renders obvious that the lower edge (inclined edge 16) of the first and second extension flanges (sidewalls 15) and the back flange (abutment portion 19) of the Adams-Bundy combination define the drywall space’s size and shape, and thus bound the drywall space. EX1040, FIGS. 2–3; EX1007, 5:10-22; EX1003, ¶¶290-291.



EX1040, FIG. 2 (annotated).

G. Claims 36 and 89

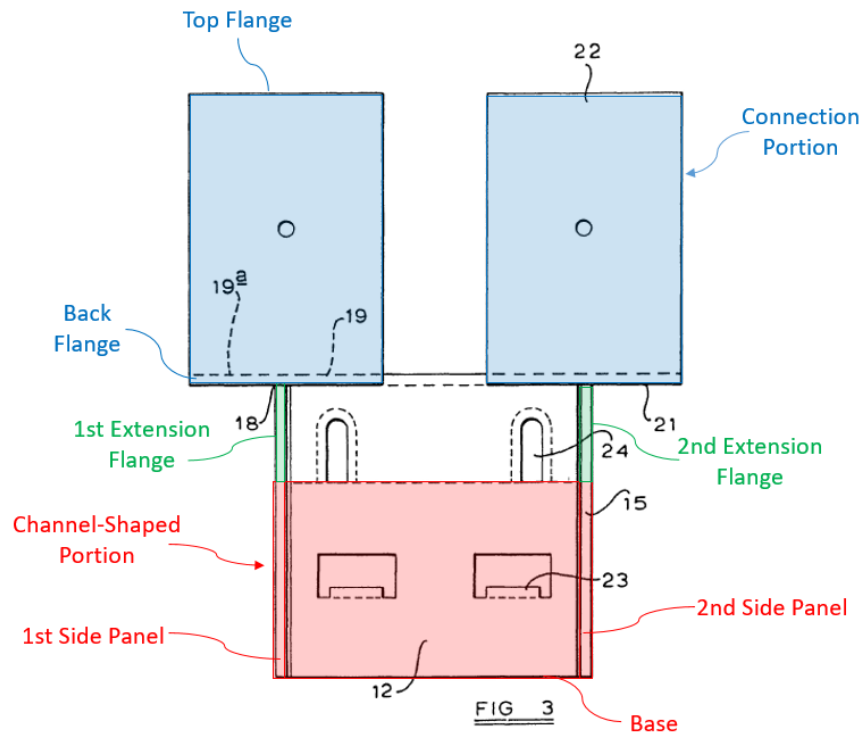
As discussed for claims 9, 13, and 61-62, Adams discloses: the channel-shaped portion (red) including a base configured to receive and support the structural component's end portion; the extension portion (green) including a first extension flange and a second extension flange extending from the connection portion to the channel-shaped portion (red) (and vice-versa, as recited in claim 89); and the first and second extension flanges being parallel to each other. As discussed for claims 14 and 66, Adams discloses the first and second side panels extending upward from the base (annotated below). EX1003, ¶292.



EX1040, FIG. 2 (annotated).

Adams further discloses each side panel (section of sidewalls 15 above base 14) being co-planar with its respective extension flange (section of sidewalls 15

above edge 16), as they share the same vertical orientation. As the first and second extension flanges are parallel to each other, and the first and second side panels are respectively co-planar therewith, Adams discloses the first and second extension flanges and the first and second side panels are all parallel to each other, as shown below. EX1040, FIGS 2–4; EX1003, ¶¶293–294.



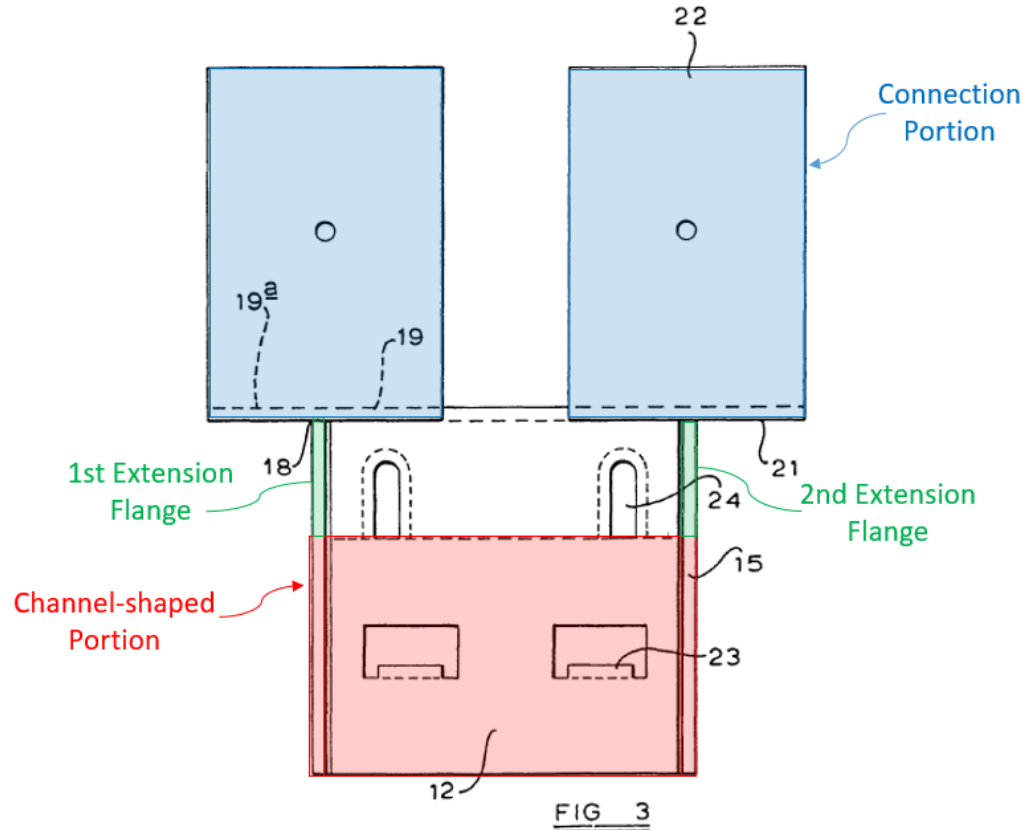
EX1040, FIG. 3 (annotated).

H. Claims 38 and 91

As discussed for claims 9, 13, 61, and 62, Adams discloses the extension portion including first and second extension flanges (sidewalls 15 above edge 16) extending from the connection portion (sidewalls 15 above base 14) to the channel-

shaped portion (abutment portion 19) (and vice-versa, as recited in claim 91).

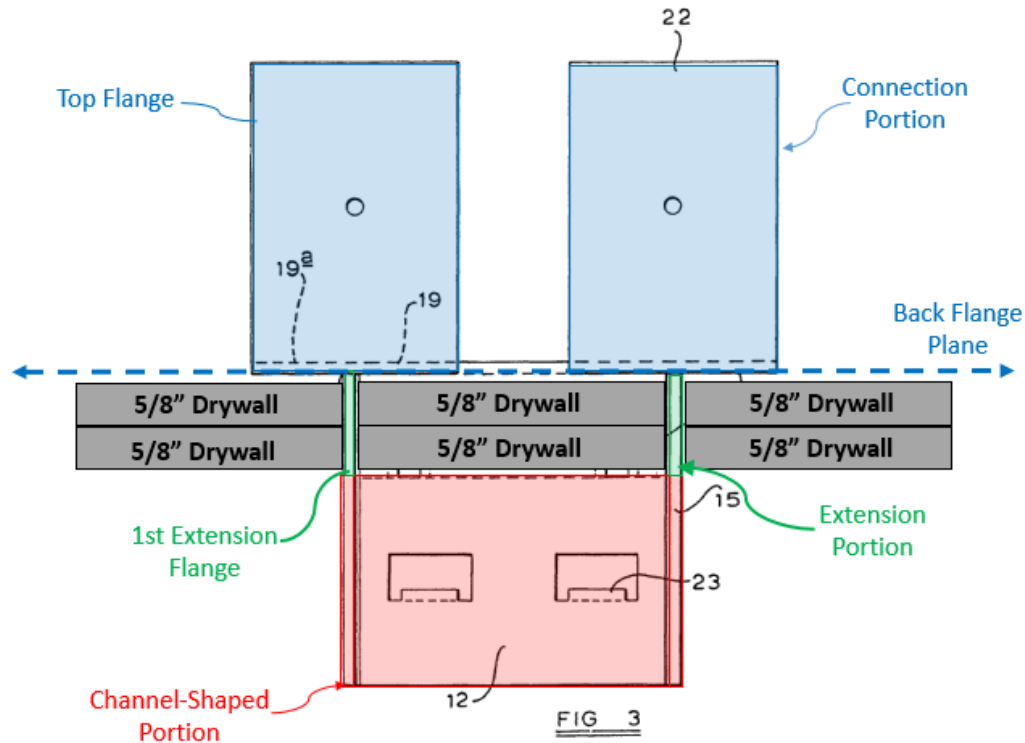
EX1003, ¶295.



EX1040, FIG. 3 (annotated).

Because Adams's extension flanges are in an opposed, face-to-face relation and are symmetrical to each other across a juncture like the extension flanges shown in Figure 7 of the '626 patent, Adams's discloses the first and second extension flanges engaging each other along a juncture as the term "engage" used in the '626 patent (EX1001, Abstract). EX1003, ¶296. In combining the teachings of Bundy's use of drywall in the Adams-Bundy combination, the juncture of the

resulting extension flanges (sidewall 15 above edge 16) would be positioned within the two layers of 5/8-inch-thick drywall. EX1003, ¶¶296-297.



EX1040, FIG. 3 (annotated).

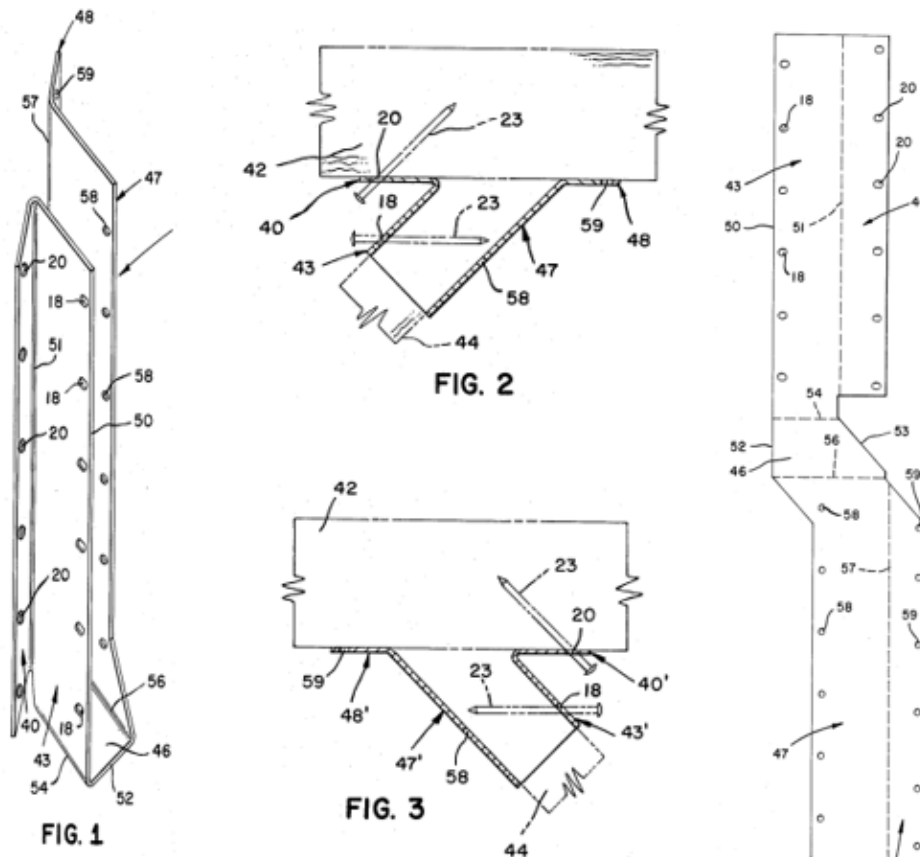
IX. CLAIMS 15, 31, 37, 67, 83 AND 90 WOULD HAVE BEEN OBVIOUS OVER ADAMS IN VIEW OF BUNDY, FURTHER IN VIEW OF GILB'416.

Each element of independent claims 1 and 53 is described above in §VIII with respect to Adams and Bundy. However, neither Adams nor Bundy appear to show how the hanger would mount a structural member at a non-orthogonal angle with respect to the wall. For the following reasons, claims 15, 31, 37, 67, 83 and

90 would have been obvious over Adams in view of Bundy, further in view of Gilb'416. EX1003, ¶¶298-299.

A. Motivation to Combine Adams, Bundy, and Gilb'416.

Bending a hanger to skew and orient its channel-shaped portion so as to mount a structural member at a non-orthogonal angle with respect to the wall was well-known, as evidenced by Gilb'416. EX1003, ¶300. Gilb'416 discloses a metal connector (i.e., a hanger) for “joining wood members which intersect at an angle less than 90 degrees,” as shown below. EX1011, Abstract; 3:31–4:19.



EX1011, FIGS. 1–4.

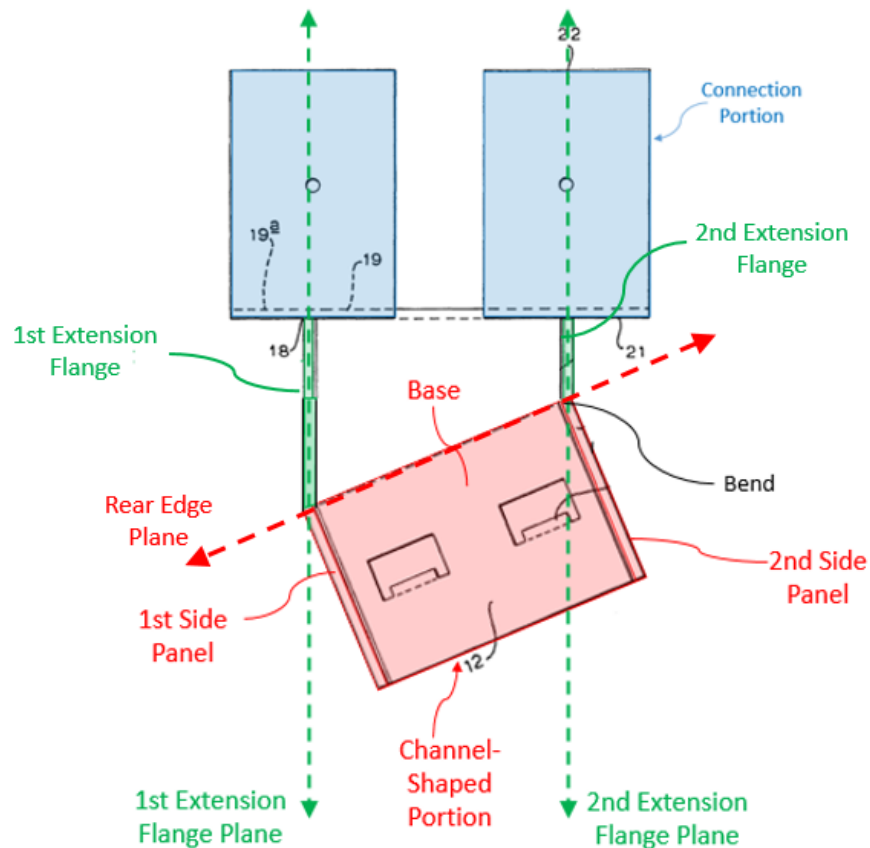
Gilb'416's hanger includes a channel-shaped portion having "a seat member 46 which is connected to the first side member [43] and a second side member 47 positioned parallel to the first side member [43]." EX1011, 3:39–42. Gilb'416's hanger includes "a first face member [40] ... adapted for nailing to a supporting member 42" and a "second face member 48 [that] is connected to the second side member [47] and is positioned parallel to the first face member [40]." EX1011, 3:31–44. To make its hanger "skewed," Gilb'416 teaches that "the first face member [40] is bent up 135 degrees along said first side bend line 51," which "defines a border" between first side member 43 and first face member 40, and that "the second face member 48 is bent up 45 degrees along the second side bend line 57," which "defines a border" between the second side member 47 and the second face member 48. EX1011, 3:45–66, 4:11–19; EX1003, ¶301.

Given that angling a framing connector was well-known, a POSITA would have had a reasonable expectation of success in modifying the angles of Adams's channel-shaped portion to mount a connecting framing member (i.e., a structural component such as Adams's joist) to a wall at an angle. EX1003, ¶302. Bending the connection between Adams's extension portion (sidewalls 15 above edge 16) and channel-shaped portion (sidewalls 15 above base 14) would have been nothing more than using a known technique (angling the connection between two

structural portions as shown in Gilb'416) to improve similar devices (Adams's hanger as modified by Bundy) in the same way. EX1003, ¶302.

B. Claims 15 and 67

As discussed for claims 14 and 66, Adams discloses that the channel-shaped portion includes first and second side panels extending upward from the base, each side panel having a rear edge, the rear edges lying in a rear edge plane. EX1040, FIG. 2; EX1003, ¶303.



EX1040, FIG. 3 (rendering).

While the figures in Adams do not show its first and second side panels (whose rear edges define the rear edge plane) being skewed, it would have been obvious to modify the Adams-Bundy hanger as taught by Gilb'416 to skew the first and second side panels such that the rear edge plane is oriented at a skewed angle to the first and second extension flanges and extension flange planes.

Specifically, a POSITA would have sought to extend one of Adams-Bundy's extension flanges further away from the back flange, as shown above, to receive the joist at a sharper angle while maintaining the Adams-Bundy drywall space.

EX1003, ¶303. Doing so was well within the level of ordinary skill in the art. *See* EX1043, FIGS. 4–5; EX1044, FIG. 9; EX1045, 2; EX1003, ¶¶304-305.

C. Claims 31 and 83

For the reasons discussed for claims 30 and 82, Adams-Bundy discloses the front edge of the first extension flange being directly attached to and abutting the rear edge of the first side panel. Adams's figures do not show a bend at such abutment. As discussed in §IX.A, a POSITA would have found it obvious to bend the Adams-Bundy hanger so the channel-shaped portion would hold a structural member at a skewed angle from the wall as taught by Gilb'416. A POSITA would have understood to bend Adams's hanger as taught by Gilb'416 somewhere between the connection portion and the channel-shaped portion to maintain secure connection with the wall and structural member, respectively. EX1003, ¶306. To

reduce the complexity in cutting drywall for installation between the non-orthogonal channel-shaped portion and connection portion, a POSITA would have kept the extension flanges of the Adams-Bundy-Gilb'416 hanger orthogonal to the wall. *Id.* A POSITA would thus have added a bend to the hanger where the front edge of the first extension flange abuts the rear edge of the first side panel, on the other side of Adams-Bundy's drywall space from the wall, as shown in §IX.B. EX1003, ¶¶306-307.

D. Claims 37 and 90

As discussed in §IX.A, a POSITA would have found it obvious to bend the Adams-Bundy hanger so the channel-shaped portion would hold a structural component at a non-orthogonal angle from the wall as taught by Gilb'416. As the connection portion connects to the wall, and the channel-shaped portion supports the structural member, a POSITA would have understood to arrange Adams-Bundy's channel-shaped portion with respect to the connection portion so as to mount the structural component at a non-orthogonal angle relative to the frame wall given the Adams-Bundy-Gilb'416 combination. EX1003, ¶¶308-309.

X. MANDATORY NOTICES (37 C.F.R. §42.8(A)(1))

REAL PARTY IN INTEREST: The real parties-in-interest are Petitioner Simpson Strong-Tie Company Inc. and its parent company, Simpson Manufacturing Co., Inc.

RELATED MATTERS: The '626 Patent is a continuation of the '867 Patent, whose claims 1–12, 15–17, and 21–23 were held unpatentable in post-grant proceeding *Simpson Strong-Tie Company Inc. v. Columbia Insurance Company*, PGR2021-00109, Paper 73 (P.T.A.B. Mar. 15, 2023), currently on appeal to the Court of Appeals for the Federal Circuit in case No. 23-1944. The '867 Patent is a continuation of the '510 Patent, which was held unpatentable in post-grant proceeding *Simpson Strong-Tie Company Inc. v. Columbia Insurance Company*, PGR2019-00063, Paper 52 (P.T.A.B. Mar. 11, 2021), upheld on appeal to the Court of Appeals for the Federal Circuit in case No. 21-214. Patent Owner filed a Complaint on May 17, 2023 in the related litigation, *Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc.*, 4-23-cv-02432 (N.D. Cal.), which asserted infringement of the '626 Patent and '867 Patent.

LEAD AND BACKUP COUNSEL: Under 37 C.F.R. §§42.8(b)(3) and 42.10(a), Petitioner appoints **Michelle K. Holoubek** (Reg. No. 54,179) as lead counsel and **John Higgins** (Reg. No. 74,992) as back-up counsel, both at the address: Sterne, Kessler, Goldstein & Fox PLLC, 1101 K Street, NW, 10th Floor, Washington, DC, 20005, phone (202) 371-2600, and facsimile (202) 371-2540.

SERVICE INFORMATION: Petitioner consents to electronic service by email at: **holoubek-PTAB@sternekessler.com**, **jhiggins-PTAB@sternekessler.com**, and **PTAB@sternekessler.com**.

XI. GROUNDS FOR STANDING (37 C.F.R. §42.204(A))

Pursuant to 37 C.F.R. §42.204(a), Petitioner hereby certifies that the '626 Patent is available for post-grant review in accordance with 37 C.F.R. §42.202(a), and that Petitioner is not barred or estopped from requesting post-grant review challenging the claims of the '626 Patent on the grounds identified in this Petition.

This Petition is filed within nine months from the date of the grant of the '626 Patent.

XII. CONCLUSION

For the reasons above, post-grant review of claims 1, 9–15, 21, 29–38, 53, 61–67, 73, and 81–91 of U.S. Patent No. 11,649,626 is requested.

Respectfully submitted,

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Date: August 17, 2023

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Petition complies with the type-volume limitation of 18,700 words, comprising 18,681 words, excluding the parts exempted by 37 C.F.R. § 42.24(a).

2. This Petition complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14 point Times New Roman.

Respectfully submitted,

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/ Michelle K. Holoubek /

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Simpson Strong-Tie Company Inc.

Date: August 17, 2023

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CERTIFICATION OF SERVICE (37 C.F.R. §§42.6(e), 42.105(a))

The undersigned hereby certifies that on August 17, 2023, true and correct copies of the foregoing **PETITION FOR POST-GRANT REVIEW OF U.S. PATENT NO. 11,649,626** and all associated exhibits were served in their entirety on the following parties via FedEx® Express:

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Respectfully submitted,

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Claims Appendix – U.S. Patent No. 11,649,626

The claim listing includes all the corrected language set forth in the Certificate of Correction issued June 13, 2023.

Claim 1

Element	
[1.P]	A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall
[1.1]	a channel-shaped portion configured to receive the structural component
[1.2.A]	a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,
[1.2.B]	a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,
[1.3.A]	an extension portion including a first extension flange extending from the back flange of the connection portion to the channel-shaped portion;
[1.3.B]	the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane
[1.4]	wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another

Claim 2

Element	
[2]	The fire wall hanger of claim 1, further comprising a stop arranged to engage and space an end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane.

Claim 3

Element	
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[3]	The fire wall hanger of claim 2, wherein the stop comprises first and second back panels extending toward each other.
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Claim 4

Element	
[4]	The fire wall hanger of claim 3, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first back panel being directly attached to the first extension flange, and the second back panel being directly attached to the second extension flange.

Claim 5

Element	
[5]	The fire wall hanger of claim 4, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the channel-shaped portion including first and second side panels extending upward from the base, the first back panel being directly attached to the first side panel, and the second back panel being directly attached to the second side panel.

Claim 6

Element	
[6]	The fire wall hanger of claim 2, wherein the stop is part of the channel-shaped portion.

Claim 7

Element	
[7]	The fire wall hanger of claim 6, wherein the channel-shaped portion bounds a channel sized and shaped to receive the structural component, the stop comprising a first back panel bounding the channel.

Claim 8

Element	
[8]	The fire wall hanger of claim 7, wherein the stop comprises a second back panel bounding the channel.

Claim 9

Element	
[9]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange lies in a first extension flange plane, the first extension flange plane being generally perpendicular to the base plane.

Claim 10

Element	
[10]	The fire wall hanger of claim 9, wherein the first extension flange is generally planar.

Claim 11

Element	
[11]	The fire wall hanger of claim 10, wherein the first extension flange is arranged to extend edgewise through the two layers of $\frac{5}{8}$ -inch-thick drywall.

Claim 12

Element	
[12]	The fire wall hanger of claim 9, wherein the first extension flange includes an upper free edge.

Claim 13

Element	
[13]	The fire wall hanger of claim 9, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange lying in a second extension flange plane, the second extension flange plane being generally perpendicular to the base plane and parallel to the first extension flange plane.

Claim 14

Element	
[14]	The fire wall hanger of claim 13, wherein the channel-shaped portion includes first and second side panels extending upward from the base,

	the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being perpendicular to the first and second extension flange planes.
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Claim 15

Element	
[15]	The fire wall hanger of claim 13, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being oriented at a skewed angle to the first and second extension flange planes.

Claim 16

Element	
[16]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange is directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane.

Claim 17

Element	
[17]	The fire wall hanger of claim 16, wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane.

Claim 18

Element	
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[18]	The fire wall hanger of claim 17, wherein the first extension flange is directly attached to the back flange of the connection portion by the second connection.
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Claim 19

Element	
[19]	The fire wall hanger of claim 17, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange being directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane.

Claim 20

Element	
[20]	The fire wall hanger of claim 16, wherein the channel-shaped portion includes a side panel having an upper edge, the lower end of the first connection being disposed at an elevation located in an inclusive range between the base plane and the upper edge of the side panel.

Claim 21

Element	
[21]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange includes an edge, the first extension flange extending edgewise from the channel-shaped portion toward the back flange in an

	extension direction, the extension direction being parallel to the base plane.
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Claim 22

Element	
[22]	The fire wall hanger of claim 1, wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal.

Claim 23

Element	
[23]	The fire wall hanger of claim 1, wherein the first extension flange and the connection portion are formed as one-piece of sheet metal.

Claim 24

Element	
[24]	The fire wall hanger of claim 1, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

Claim 25

Element	
[25]	The fire wall hanger of claim 1, wherein the channel-shaped portion is made of sheet metal, the first extension flange being an extension of the sheet metal forming the channel-shaped portion.

Claim 26

Element	
[26]	The fire wall hanger of claim 1, wherein the first extension flange and the channel-shaped portion are formed as one-piece.

Claim 27

Element	
[27]	The fire wall hanger of claim 1, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece.

Claim 28

Element	
[28]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, the channel-shaped portion including a first side panel extending upward from the base, and wherein the first side panel is spaced apart from the front surface of the back flange along a first axis that is normal to the front surface of the back flange, the first axis intersecting the first side panel and the front surface of the back flange.

Claim 29

Element	
[29]	The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first and second extension flanges being parallel to one another.

Claim 30

Element	
[30]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

Claim 31

Element	
[31]	The fire wall hanger of claim 30, wherein the first extension flange is directly attached to the first side panel by way of a bend such that the front edge of the first extension flange abuts the rear edge of the first side panel.

Claim 32

Element	
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[32]	The fire wall hanger of claim 1, wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange.
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Claim 33

Element	
[33]	The fire wall hanger of claim 1, further comprising a drywall space sized and shaped to receive the two layers of $\frac{5}{8}$ -inch-thick drywall therein, the channel-shaped portion and the back flange plane bounding the drywall space.

Claim 34

Element	
[34]	The fire wall hanger of claim 33, wherein the first extension flange bounds the drywall space.

Claim 35

Element	
[35]	The fire wall hanger of claim 34, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange bounding the drywall space.

Claim 36

Element	
[36]	The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

Claim 37

Element	
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[37]	The fire wall hanger of claim 1, wherein the channel-shaped portion is arranged with respect to the connection portion to mount the structural component at a non-orthogonal angle relative to the frame wall.
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Claim 38

Element	
[38]	The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first and second extension flanges engaging each other along a juncture, the juncture arranged to be positioned within the two layers of $\frac{5}{8}$ -inch-thick drywall.

Claim 39

Element	
[39]	The fire wall hanger of claim 1, wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane.

Claim 40

Element	
[40]	The fire wall hanger of claim 39, wherein the first top flange includes a first rear edge located rearwardly of the edge of the first top flange from which the first back flange extends, and wherein the second top flange includes a second rear edge located rearwardly of the edge of the second top flange from which the second back flange extends, the first rear edge being located rearwardly of the first back flange and the second rear edge being located rearwardly of the second back flange.

Claim 41

Element	
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[41]	The fire wall hanger of claim 40, wherein the extension portion includes a second extension flange extending from the second back flange to the channel-shaped portion.
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Claim 42

Element	
[42]	The fire wall hanger of claim 41, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, and wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other.

Claim 43

Element	
[43]	The fire wall hanger of claim 42, wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

Claim 44

Element	
[44]	The fire wall hanger of claim 43, wherein the first extension flange and the first back flange are directly attached to each other by a first bend, the first back flange and the first top flange are directly attached to each other by a second bend, the second extension flange and the second back flange are directly attached to each other by a third bend, and the second back flange and the second top flange are directly attached to each other by a fourth bend.

Claim 45

Element	
[45]	The fire wall hanger of claim 44, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

Claim 46

Element	
[46]	The fire wall hanger of claim 1, wherein the channel-shaped portion and the connection portion are spaced apart from one another.

Claim 47

Element	
[47]	The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, and wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange.

Claim 48

Element	
[48]	The fire wall hanger of claim 47, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, each of the first and second side panels having an inner face and an outer face, the inner faces of the first and second side panels facing one another, wherein the outer face of the first side panel is disposed outward, in the second direction, of the inner face of the first extension flange and the outer face of the second side panel is disposed outward, in the first direction, of the inner face of the second extension flange.

Claim 49

Element	
[49]	The fire wall hanger of claim 47, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the outer faces of the first and second extension flanges each have a height extending in a direction that is perpendicular to the base plane and a length extending in a direction that is parallel to the base plane and

	perpendicular to the first direction, the height of the outer face of the first extension flange being greater than the length of the outer face of the first extension flange, and the height of the outer face of the second extension flange being greater than the length of the outer face of the second extension flange.
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Claim 50

Element	
[50.P]	The fire wall hanger of claim 1, further comprising
[50.1]	a stop arranged to engage an end of the structural component to space the end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane;
[50.2]	wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane;
[50.3]	wherein the first extension flange is directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane;
[50.4]	wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane;
[50.5]	wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal;
[50.6]	wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange; and

[50.7]	wherein the channel-shaped portion and the connection portion are spaced apart from one another.
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Claim 51

Element	
[51]	The fire wall hanger of claim 50,
[51.1]	wherein the stop comprises first and second back panels extending toward each other;
[51.2]	wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange being directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane;
[51.3]	wherein the channel-shaped portion includes a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel; and
[51.4]	wherein the fire wall hanger further comprises a drywall space sized and shaped to receive the two layers of $\frac{5}{8}$ -inch-thick drywall therein, the channel-shaped portion, the first and second extension flanges and the back flange plane bounding the drywall space.

Claim 52

Element	
[52]	The fire wall hanger of claim 51,
[52.1]	wherein the first back panel is directly attached to the first extension flange and the second back panel is directly attached to the second extension flange;
[52.2]	wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal;
[52.3]	wherein the channel-shaped portion includes a second side panel extending upward from the base, and wherein the first and second

	extension flanges are parallel to each other and the first and second side panels are parallel to each other;
[52.4]	wherein the back flange is a first back flange and the top flange is a first top flange, and
[52.5]	wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane; and
[52.6]	wherein the second extension flange extends from the second back flange to the channel-shaped portion, and
[52.7]	wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the first back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange, and the second back flange having a side edge disposed outward, in the first direction, of the outer face of the second extension flange.

Claim 53

Element	
[53.P]	A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of 5/8-inch-thick drywall mounted thereon to form a fire separation wall,
[53.1]	a channel-shaped portion configured to receive the structural component,
[53.2]	an extension portion extending from the channel-shaped portion and configured to extend through the two layers of 5/8-inch-thick drywall;
[53.3.A]	a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and,
[53.3.B]	a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane,

[53.4]	the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane
[53.5]	wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another

Claim 54

Element	
[54]	The fire wall hanger of claim 53, further comprising a stop arranged to engage an space an end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane.

Claim 55

Element	
[55]	The fire wall hanger of claim 54, wherein the stop comprises first and second back panels extending toward each other.

Claim 56

Element	
[56]	The fire wall hanger of claim 55, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first back panel being directly attached to the first extension flange, and the second back panel being directly attached to the second extension flange.

Claim 57

Element	
[57]	The fire wall hanger of claim 56, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the channel-shaped portion including first and second side panels extending upward from the base, the first back panel being directly attached to

	the first side panel, and the second back panel being directly attached to the second side panel.
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Claim 58

Element	
[58]	The fire wall hanger of claim 54, wherein the stop is part of the channel-shaped portion.

Claim 59

Element	
[59]	The fire wall hanger of claim 58, wherein the channel-shaped portion bounds a channel sized and shaped to receive the structural component, the stop comprising a first back panel bounding the channel.

Claim 60

Element	
[60]	The fire wall hanger of claim 59, wherein the stop comprises a second back panel bounding the channel.

Claim 61

Element	
[61]	The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange extending from the channel-shaped portion to the connection portion, the first extension flange being generally perpendicular to the base plane.

Claim 62

Element	
[62]	The fire wall hanger of claim 61, wherein the extension portion includes a second extension flange extending from the channel-shaped portion to the connection portion, the second extension flange being generally perpendicular to the base plane and parallel to the first extension flange.

Claim 63

Element	
[63]	The fire wall hanger of claim 62, wherein the first and second extension flanges are each generally planar.

Claim 64

Element	
[64]	The fire wall hanger of claim 63, wherein the first and second extension flanges each include an edge, the first and second extension flanges each being arranged to extend edgewise through the two layers of $\frac{5}{8}$ -inch-thick drywall.

Claim 65

Element	
[65]	The fire wall hanger of claim 64, wherein the first and second extension flanges each include an upper free edge.

Claim 66

Element	
[66]	The fire wall hanger of claim 62, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being perpendicular to the first and second extension flanges.

Claim 67

Element	
[67]	The fire wall hanger of claim 62, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being oriented at a skewed angle to the first and second extension flanges.

Claim 68

Element	
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[68]	The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane.
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Claim 69

Element	
[69]	The fire wall hanger of claim 68, wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane.

Claim 70

Element	
[70]	The fire wall hanger of claim 69, wherein the first extension flange is directly attached to the back flange of the connection portion by the second connection.

Claim 71

Element	
[71]	The fire wall hanger of claim 69, wherein the extension portion includes a second extension flange directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth

	connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane.
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Claim 72

Element	
[72]	The fire wall hanger of claim 71, wherein the channel-shaped portion includes a side panel having an upper edge, the lower end of the first connection being disposed at an elevation located between the base plane and the upper edge of the side panel and the lower end of the third connection being disposed at an elevation located between the base plane and the upper edge of the side panel.

Claim 73

Element	
[73]	The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange and a second extension flange, each of the first and second extension flanges having an edge, the first and second extension flanges each extending edgewise from the channel-shaped portion toward the back flange plane in an extension direction, the extension directions being parallel to the base plane.

Claim 74

Element	
[74]	The fire wall hanger of claim 53, wherein the extension portion and the channel-shaped portion are formed as one-piece of sheet metal.

Claim 75

Element	
[75]	The fire wall hanger of claim 53, wherein the extension portion and the connection portion are formed as one-piece of sheet metal.

Claim 76

Element	
[76]	The fire wall hanger of claim 53, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

Claim 77

Element	
[77]	The fire wall hanger of claim 53, wherein the channel-shaped portion is made of sheet metal, the extension portion being an extension of the sheet metal forming the channel-shaped portion.

Claim 78

Element	
[78]	The fire wall hanger of claim 53, wherein the extension portion and the channel-shaped portion are formed as one-piece.

Claim 79

Element	
[79]	The fire wall hanger of claim 53, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece.

Claim 80

Element	
[80]	The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, the channel-shaped portion including a first side panel extending upward from the base, and wherein the first side panel is spaced apart from the front surface of the back flange along a first axis that is normal to the front surface of the back flange, the first axis intersecting the first side panel and the front surface of the back flange.

Claim 81

Element	
[81]	The fire wall hanger of claim 55, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first and second extension flanges being parallel to one another.

Claim 82

Element	
[82]	The fire wall hanger of claim 55, wherein the extension portion includes a first extension flange extending from the channel-shaped portion toward the connection portion, and wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

Claim 83

Element	
[83]	The fire wall hanger of claim 82, wherein the first extension flange is directly attached to the first side panel by way of a bend such that the front edge of the first extension flange abuts the rear edge of the first side panel.

Claim 84

Element	
[84]	The fire wall hanger of claim 53, wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange.

Claim 85

Element	
[85]	The fire wall hanger of claim 53, further comprising a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein, the channel-shaped portion and the back flange plane bounding the drywall space.

Claim 86

Element	
[86]	The fire wall hanger of claim 85, wherein the extension portion includes first and second extension flanges bounding the drywall space.

Claim 87

Element	
[87]	The fire wall hanger of claim 86, wherein the first and second extension flanges each include a lower edge bounding the drywall space.

Claim 88

Element	
[88]	The fire wall hanger of claim 87, wherein the back flange bounds the drywall space.

Claim 89

Element	
[89]	The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

Claim 90

Element	
[90]	The fire wall hanger of claim 53, wherein the channel-shaped portion is arranged with respect to the connection portion to mount the structural component at a non-orthogonal angle relative to the frame wall.

Claim 91

Element	
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[91]	The fire wall hanger of claim 53, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first and second extension flanges engaging each other along a juncture, the juncture arranged to be positioned within the two layers of 5/8-inch-thick drywall.
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Claim 92

Element	
[92]	The fire wall hanger of claim 53, wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane.

Claim 93

Element	
[93]	The fire wall hanger of claim 92, wherein the first top flange includes a first rear edge located rearwardly of the edge of the first top flange from which the first back flange extends, and wherein the second top flange includes a second rear edge located rearwardly of the edge of the second top flange from which the second back flange extends, the first rear edge being located rearwardly of the first back flange and the second rear edge being located rearwardly of the second back flange.

Claim 94

Element	
[94]	The fire wall hanger of claim 92, wherein the extension portion includes first and second extension flanges, the first extension flange extending from the channel-shaped portion to the first back flange, and the second extension flange extending from the channel-shaped portion to the second back flange.

Claim 95

Element	
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[95]	The fire wall hanger of claim 94, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, and wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other.
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Claim 96

Element	
[96]	The fire wall hanger of claim 95, wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

Claim 97

Element	
[97]	The fire wall hanger of claim 96, wherein the first extension flange and the first back flange are directly attached to each other by a first bend, the first back flange and the first top flange are directly attached to each other by a second bend, the second extension flange and the second back flange are directly attached to each other by a third bend, and the second back flange and the second top flange are directly attached to each other by a fourth bend.

Claim 98

Element	
[98]	The fire wall hanger of claim 97, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

Claim 99

Element	
[99]	The fire wall hanger of claim 55, wherein the channel-shaped portion and the connection portion are spaced apart from one another.

Claim 100

Element	
[100]	The fire wall hanger of claim 53, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, and wherein the

	first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange.
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Claim 101

Element	
[101]	The fire wall hanger of claim 100, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, each of the first and second side panels having an inner face and an outer face, the inner faces of the first and second side panels facing one another, wherein the outer face of the first side panel is disposed outward, in the second direction, of the inner face of the first extension flange and the outer face of the second side panel is disposed outward, in the first direction, of the inner face of the second extension flange.

Claim 102

Element	
[102]	The fire wall hanger of claim 100, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the outer faces of the first and second extension flanges each have a height extending in a direction that is perpendicular to the base plane and a length extending in a direction that is parallel to the base plane and perpendicular to the first direction, the height of the outer face of the first extension flange being greater than the length of the outer face of the first extension flange, and the height of the outer face of the second extension flange being greater than the length of the outer face of the second extension flange.

Claim 103

Element	
[103.P]	The fire wall hanger of claim 53, further comprising
[103.1]	a stop arranged to engage an end of the structural component to space the end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane;
[103.2]	wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane;
[103.3]	wherein the extension portion includes a first extension flange directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane;
[103.4]	wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane;
[103.5]	wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal;
[103.6]	wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange; and
[103.7]	wherein the channel-shaped portion and the connection portion are spaced apart from one another.

Claim 104

Element	
[104]	The fire wall hanger of claim 103,
[104.1]	wherein the stop comprises first and second back panels extending toward each other;
[104.2]	wherein the extension portion includes a second extension flange directly attached to the channel-shaped portion by a third connection,

	the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane;
[104.3]	wherein the channel-shaped portion includes a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel; and
[104.4]	wherein the fire wall hanger further comprises a drywall space sized and shaped to receive the two layers of $\frac{5}{8}$ -inch-thick drywall therein, the channel-shaped portion, the first and second extension flanges and the back flange plane bounding the drywall space.

Claim 105

Element	
[105]	The fire wall hanger of claim 104,
[105.1]	wherein the first back panel is directly attached to the first extension flange and the second back panel is directly attached to the second extension flange;
[105.2]	wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal;
[105.3]	wherein the channel-shaped portion includes a second side panel extending upward from the base, and wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other;
[105.4]	wherein the back flange is a first back flange and the top flange is a first top flange, and
[105.5]	wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane; and

[105.6]	wherein the second extension flange extends from the second back flange to the channel-shaped portion and the first extension flange extends from the first back flange to the channel-shaped portion, and
[105.7]	wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the first back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange, and the second back flange having a side edge disposed outward, in the first direction, of the outer face of the second extension flange.