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. PGR2023-00048
Patent No. 11,649,626

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

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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	*Curriculum Vitae* 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	*Fire-Rated Assemblies in Commercial Construction ("The Purple Book")*, National Gypsum Properties, LLC (November 5, 2013)
1017	*GA-600-2012 Fire Resistance Design Manual, 20th Ed.*, Gypsum Association (June 2012).
1018	*2012 International Building Code*, 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	*Intentionally Left Blank*
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, *Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc.*, 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, *Columbia Insurance Company et al v. Simpson Strong-Tie Company Inc.*, 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 *et al*. ("the '510 Patent")
1037	Oxford Compact English Dictionary, Second Edition, Oxford University Press, (2000).

Exhibit No.	Description
1038	U.S. Patent No. 11,021,867 to Brekke et al. ("the '867 patent")
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, 22–27, 39–45, 50–53, 74–79, 92–98, and 103–105 of U.S. Patent 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 11,021,867 ("the '867 Patent), which is a continuation of U.S. Patent 10,316,510 ("the '510 Patent"). The Board held claims 1–12, 15–17, and 21–23 of the '867 patent unpatentable under PGR2021-00109, Paper 73 (P.TA.B. Mar. 15, 2023), and claims 1–20 of the '510 patent unpatentable under 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 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, ¶¶1–319. 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 17/235,349 (the '349 application), filed April 20, 2021, with an earliest possible priority date of

December 31, 2013. EX1001, (21), (22). The following prior art documents applied in the grounds of unpatentability were published or filed prior to the earliest possible priority date and constitute prior art under the noted statutes:

- Japanese Design Patent D1213894 ("Yamaguchi"), §102(a)(1) (issued August 9, 2004);
- U.S. Patent 9,394,680 ("Bundy"), §102(a)(2) (effectively filed December 14, 2013);
- U.K. Patent App. Pub. 2451853A ("Cullen"), §102(a)(1) (published February 18, 2009); and
- European Patent Pub. 0210744B1 ("Adams"), §102(a)(1) (published February 27, 1991).

B. Statutory Grounds for Challenge

Petitioner advances the following grounds of unpatentability, supported by the rationales in §§V-VIII. Claims 1 and 53 are the independent claims.

Ground	References	Basis	Claims Challenged
1	Yamaguchi, Bundy	§103	1, 39–44, 53, 92–97
2	Yamaguchi, Bundy, Adams	§103	22–27, 45, 50–52, 74–79, 98, and 103–105
3	Cullen, Bundy	§103	1, 22–27, 39–45, 50–53, 74–79, 92–98, 103–105

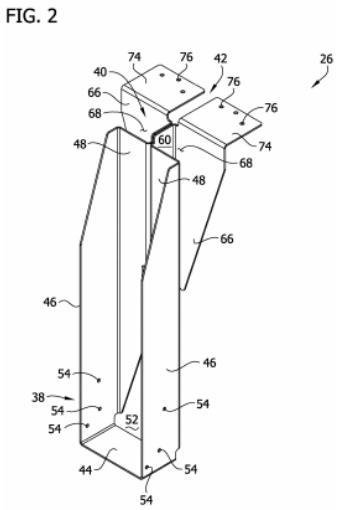
4	Adams, Bundy	§103	1, 22–27, 39–45, 50–53, 74–79, 92–98, 103–105

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.



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, that the claims do not restrict the hanger's use to a wood-frame construction only. EX1001, 4:18-29. 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, ¶¶48–50.

B. The '626 Patent Prosecution History

Before examination began, Applicant filed a preliminary amendment canceling originally-filed claims 1–20 and adding new claims 21-40. EX1002, 455–468.

The Office issued one Office Action before allowing the application. *See generally* EX1002. Therein, the Examiner rejected independent claims 21, 29, 33, and 37 as being obvious over Japanese App. Pub. JPH0314482Y2 to Tsukamoto, in view of Bundy. EX1002, 266–279.

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. EX1002, 98–105. 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. 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.

D. 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 clams' 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 sheathing[1]: "extending into one side and out of the other side of the sheathing" (FWD, 51);

[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.

- "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);
- "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 subjects 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) because grounds 2–5 are substantially different than the art and arguments previously considered by the Office. Indeed, each obviousness 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 certain '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.

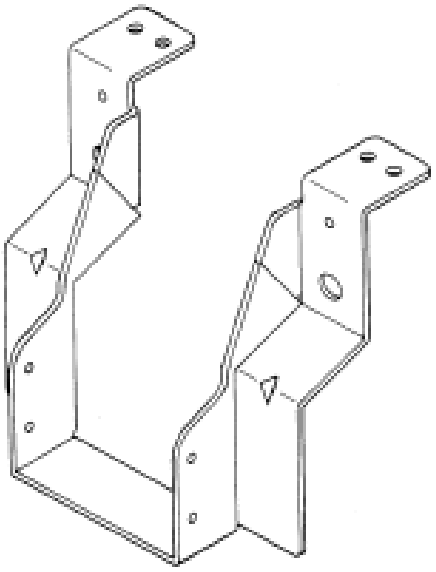
V. Claims 1, 39–44, 53, and 92–97 Would Have Been Obvious over Yamaguchi in view of Bundy.

Yamaguchi discloses each and every structural element listed in independent claims 1 and 53[2] 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, ¶¶73-74. A POSITA would have sought to combine the teachings of Bundy with Yamaguchi'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.

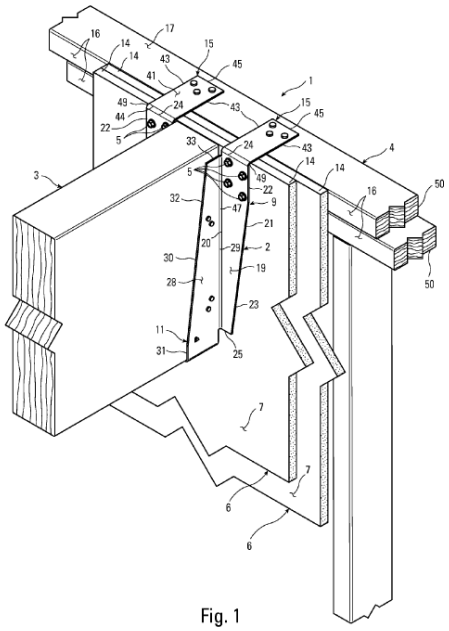
[2] Yamaguchi's captions appear above its figures, whose poor alignment leads to some confusion. For example, the figures on Yamaguchi, 2, are its "[Perspective View]" and its "[Front View]," respectively, although the captions on page 2 read "[Front View"] followed by "[Back View]." For avoidance of 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, 2 as the "perspective view."

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

Yamaguchi and Bundy are both directed to joist hangers. EX1003, ¶¶32–42, 75. Yamaguchi's hanger defines a space between its back flange and channel-shaped portion corresponding to the length of its extension portion. EX1003, ¶75. Bundy discloses sizing an extension portion of an analogous hanger to receive two 5/8-inch-thick-layers of drywall between its channel-shaped portion (seat member 12) and the front face 6 of the wall's support member 4. EX1003, ¶76; EX1007, 5:16-18. Two 5/8-inch-thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶76,



EX1041, Perspective View;



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, 1; EX1003, ¶¶77–79. 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. EX1007, 2:10–24. 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, ¶¶77–79; 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, ¶79; 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, ¶80.

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, ¶¶81. 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, ¶81; EX1007, 4:47-51. Doing so would have been well within the level of ordinary skill in the art. EX1003, ¶¶81.

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 drywall could be installed in the space behind the joist as taught by Bundy. EX1003, ¶82. 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. EX1003, ¶82. 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. EX1003, ¶¶82. 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, ¶¶82-83; 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 recites an intended use of the claimed invention, satisfied by any prior art structure capable of performing the intended use. EX1003, ¶¶84-85; *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 claim 1's body recites a structurally complete invention and uses the preamble only to state a purpose or intended use.

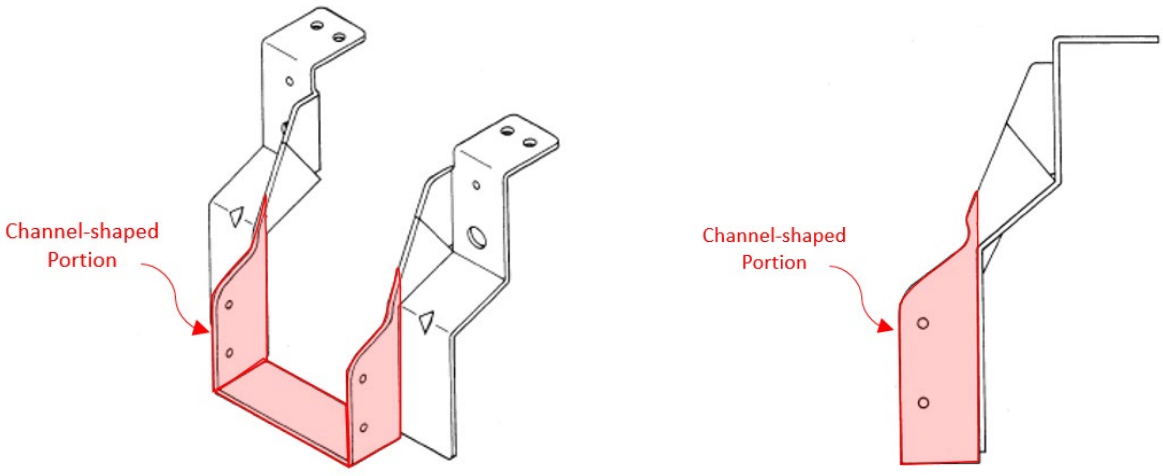
To the extent the preamble is limiting, the Yamaguchi-Bundy combination ("Yamaguchi-Bundy") renders obvious such a hanger. EX1041, 1–5; EX1003, ¶85. Yamaguchi discloses using hanger 10 for "bear[ing] a joist" but not explicitly for securing to a wall adapted to have two layers of 5/8-inch-thick drywall 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, ¶85; EX1007, 2:37-41, 5:10–22. 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 thereto. EX1003, ¶85. 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. EX1003, ¶85. 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.*; s*ee, 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, ¶¶85-86.

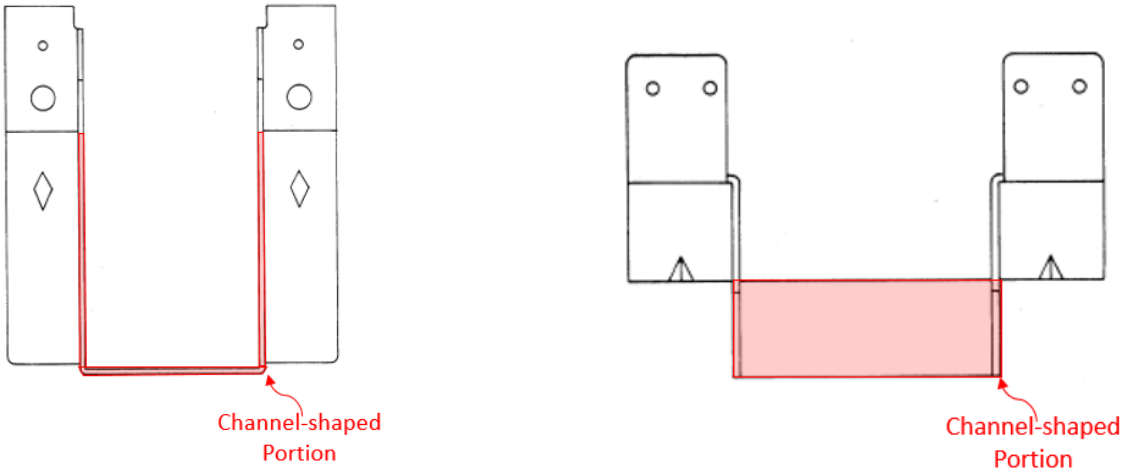
Thus, Yamaguchi-Bundy renders obvious element [1.P].

[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, ¶¶87-88; EX1041, 1–5 ("joist bracket that…bears a joist").



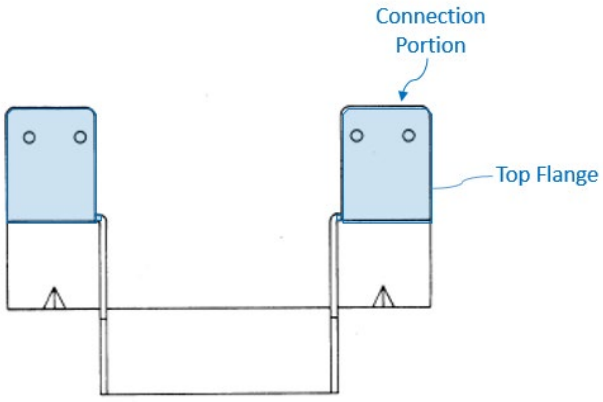
EX1041, Perspective, Side Views (annotated).



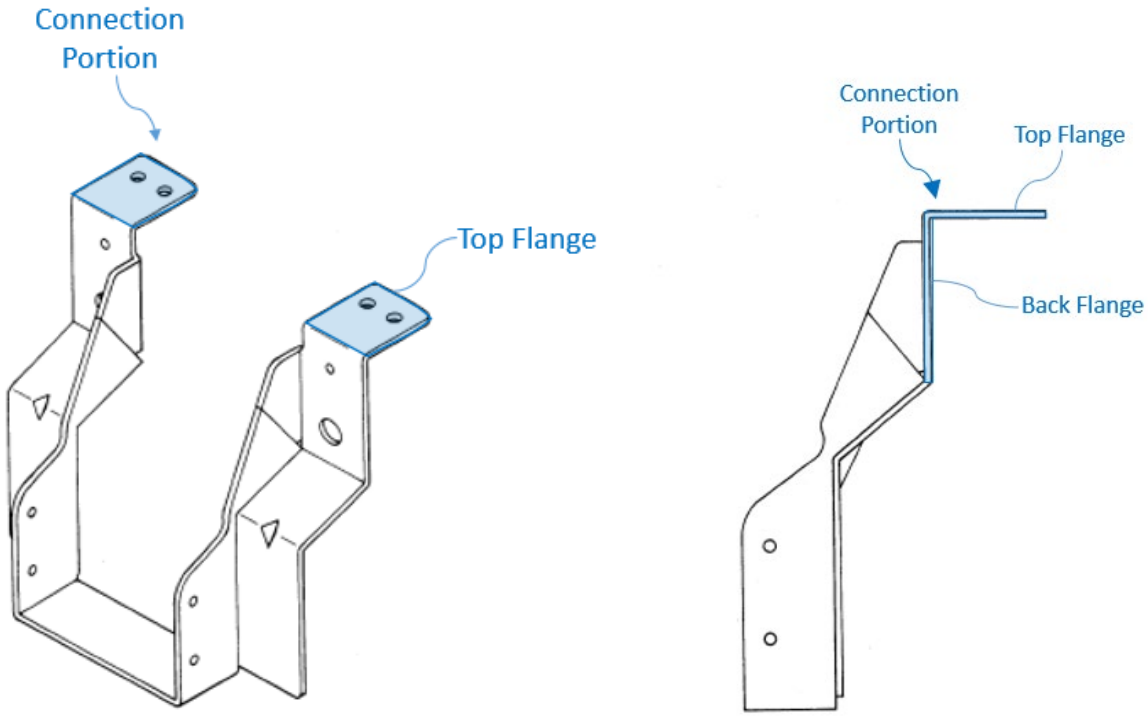
EX1041, Front, Plan views (annotated).

[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, ¶¶89-90; EX1041, 2–5.



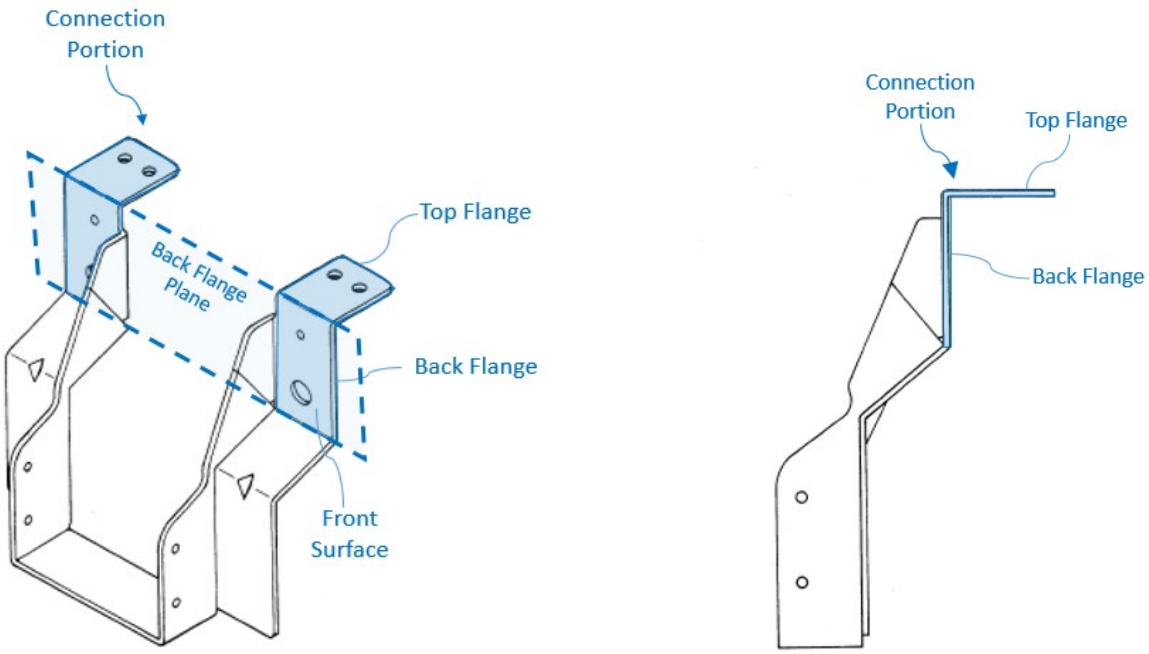
EX1041, Plan View (annotated).



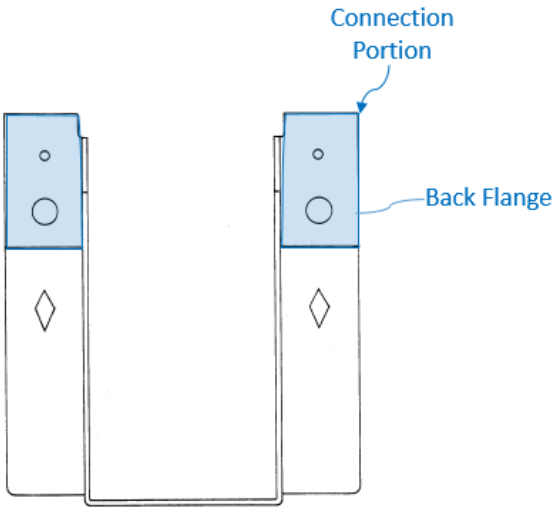
EX1041, Perspective, Side Views (annotated).

[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–horizontal), 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, ¶¶91-92; EX1041, 2–5.



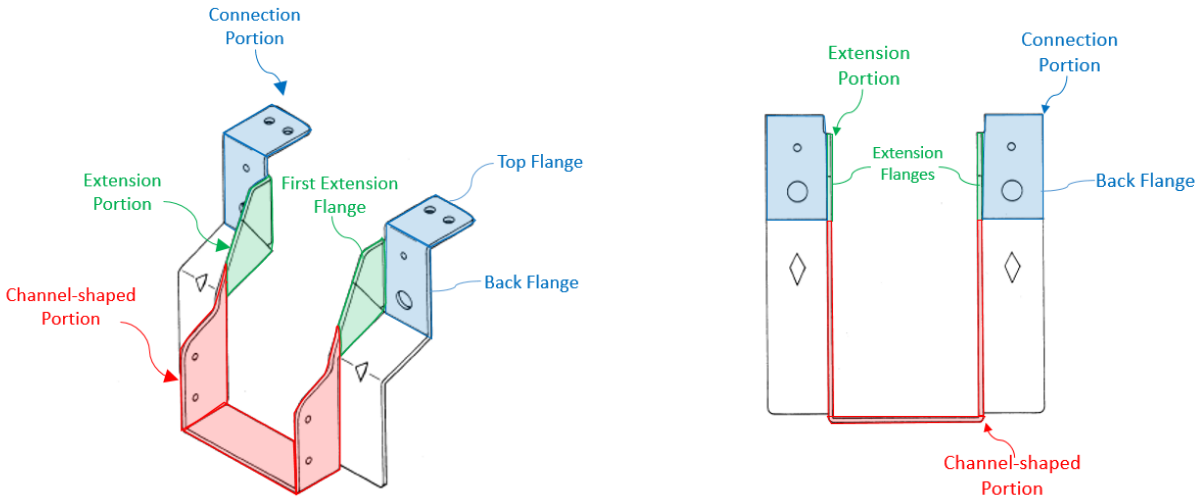
EX1041, Perspective, Side Views (annotated).



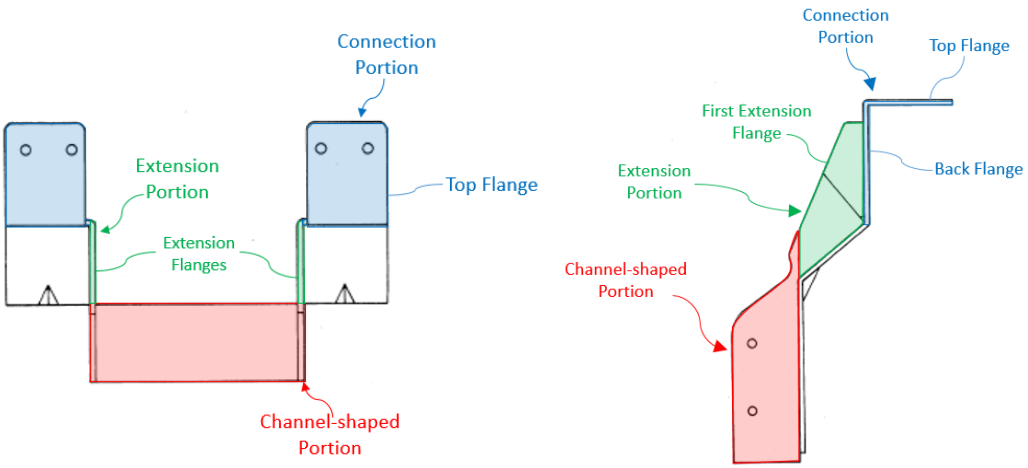
EX1041, Front View (annotated).

[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;"

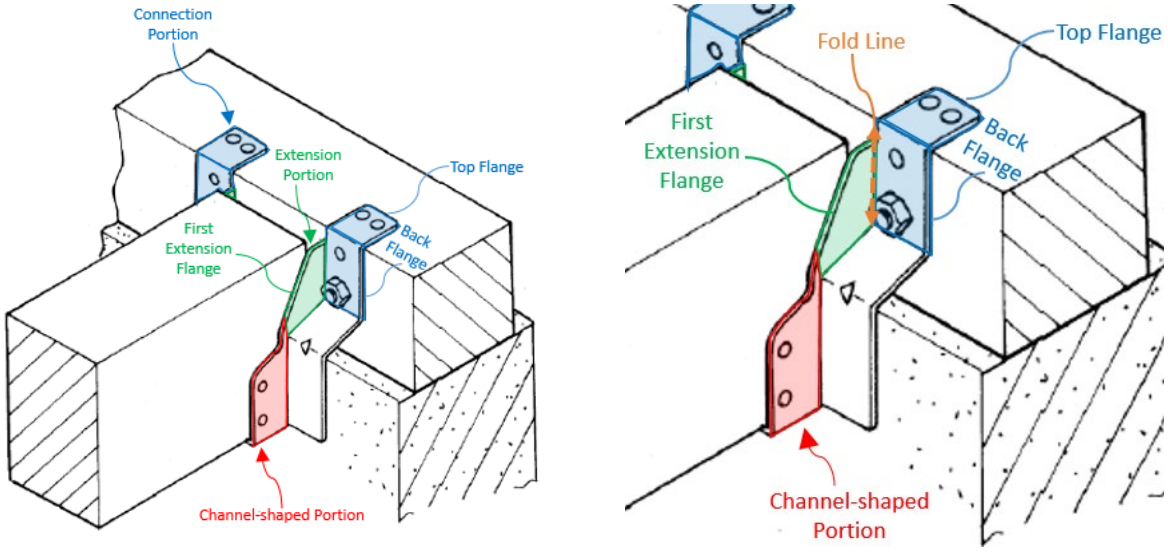
Yamaguchi discloses an extension portion (highlighted in green below) including a first extension flange (green–vertical portion) extending from the back flange (blue-vertical portion) of the connection portion to the channel-shaped portion (red) (and vice versa). EX1003, ¶¶93-94; EX1041, 1–5.



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, ¶¶94-95. 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 page 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. EX1003, ¶¶94-95; 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

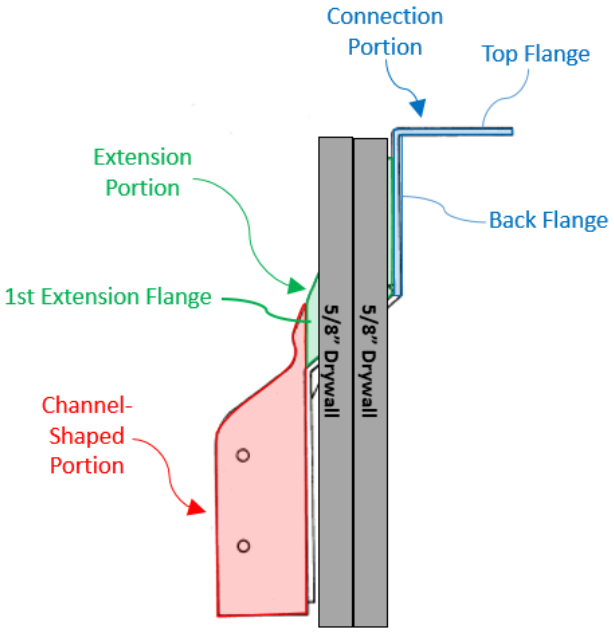
bending a contiguous piece of sheet metal along a fold line (annotated above) defined along the side edge of its back flange, such that the extension portion spans between the back flange and the channel-shaped portion with no intervening components therebetween (and vice versa). EX1003, ¶¶94-95; EX1041, 5. Accordingly, under either embodiment, Yamaguchi discloses the recited "extension flange" of claim 1. EX1003, ¶¶94-95; 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]

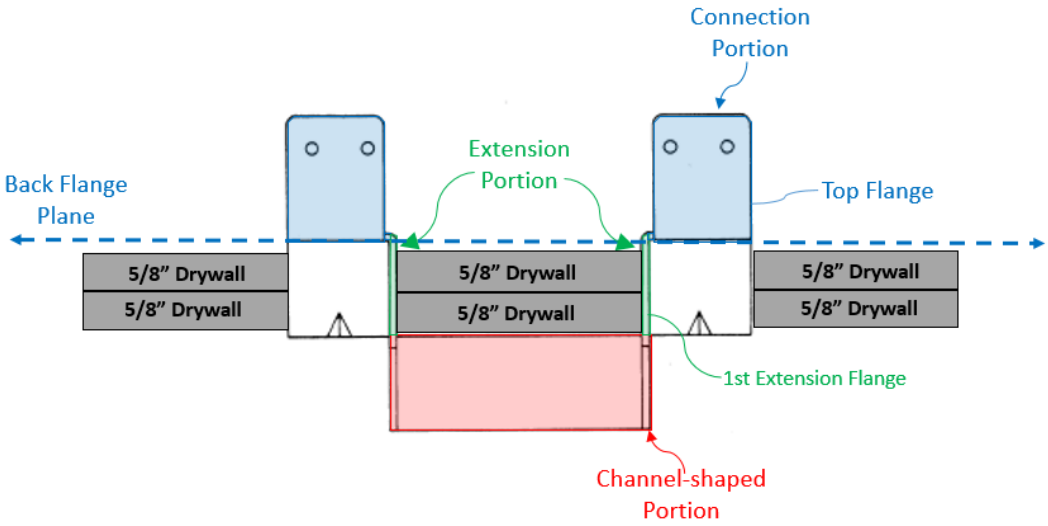
Yamaguchi's extension portion (green below) defines a space that would permit drywall to be inserted between its back flange (blue–vertical portion) and channel-shaped portion (red). EX1003, ¶96; EX1041, 2–5. While Yamaguchi does not explicitly disclose installing two layers of 5/8-inch-thick drywall 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, ¶96. Bundy teaches installing two layers of 5/8" drywall between a hanger's channel shaped portion (Bundy's side members 11) and a wall frame. EX1007, 5:18-20; EX1003, ¶96. 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, ¶96; EX1007, 4:46-51; EX1041, 1–4; *see also* §V.A.



EX1041, Side View (annotated).

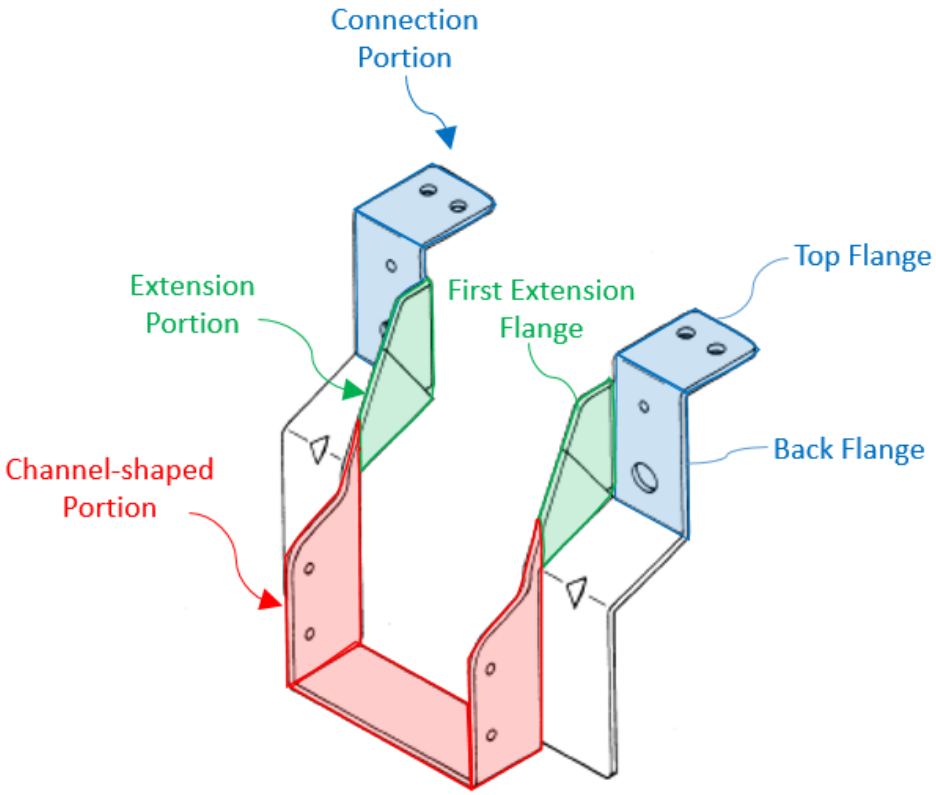


EX1041, Plan View (annotated).

Thus, Yamaguchi-Bundy renders obvious element [1.3.B].

[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 Yamguchi's hanger are connected such that they do not move freely with respect to each other. EX1003, ¶97; 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, ¶¶97-98.



EX1041, Perspective View (annotated).

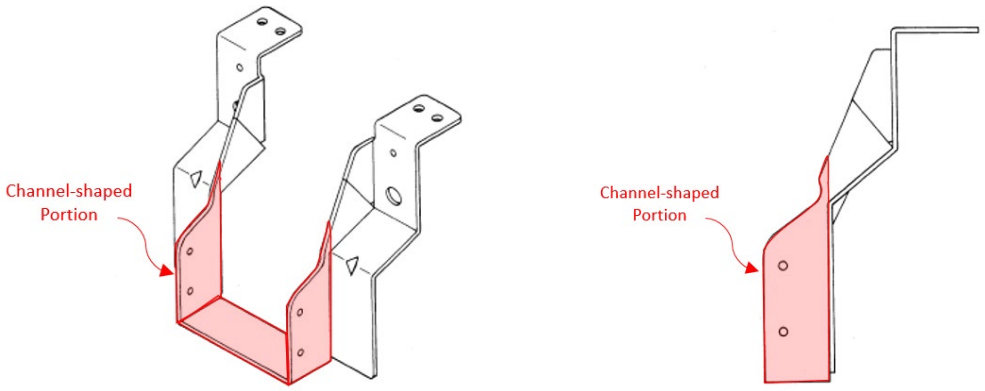
C. Independent Claim 53

[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,"

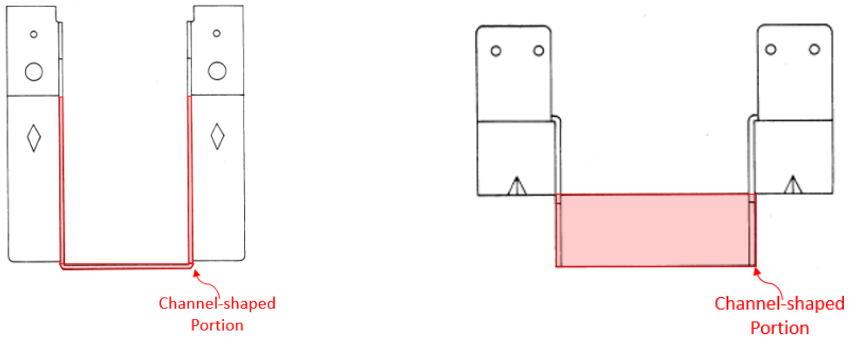
As discussed for claim 1, element [1.P], Yamaguchi–Bundy render obvious this limitation. EX1003, ¶¶99-100; EX1041, 1–4.

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

As discussed for claim 1, element [1.1.A], Yamaguchi discloses this limitation. EX1003, ¶101; EX1041, 2–5.



EX1041, Perspective, Side Views (annotated).

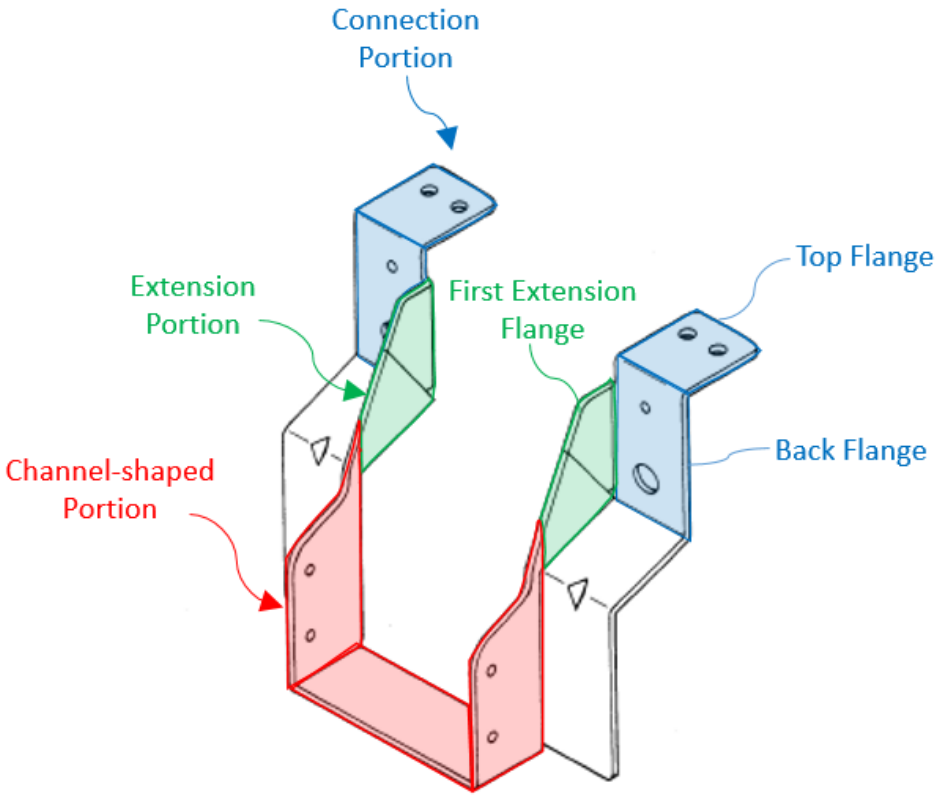


EX1041, FIGS. Front, Plan Views (annotated).

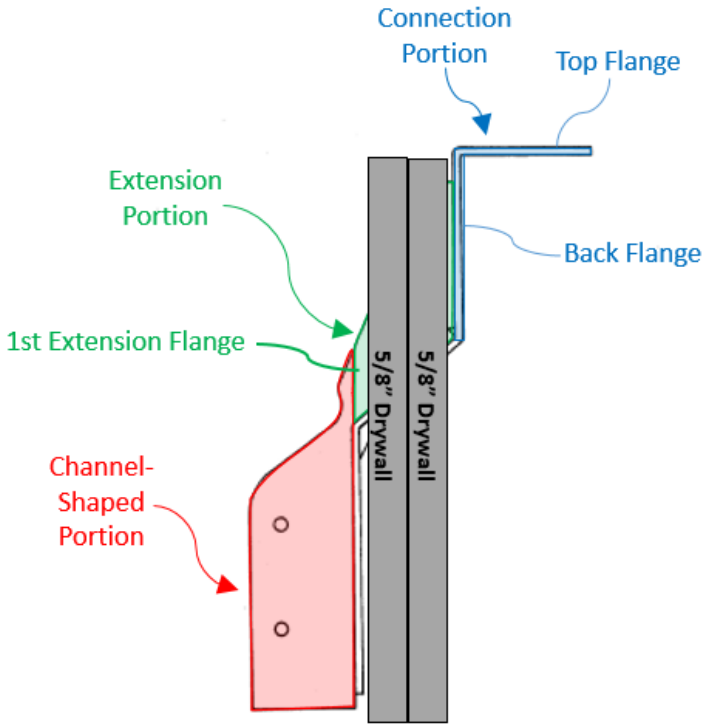
[53.2] "an extension portion extending from the channel-shaped portion and configured to extend through the two layers of 5/8-inch-thick drywall;"

Yamaguchi discloses its extension portion extending from the channel-shaped portion. EX1003, ¶102; 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

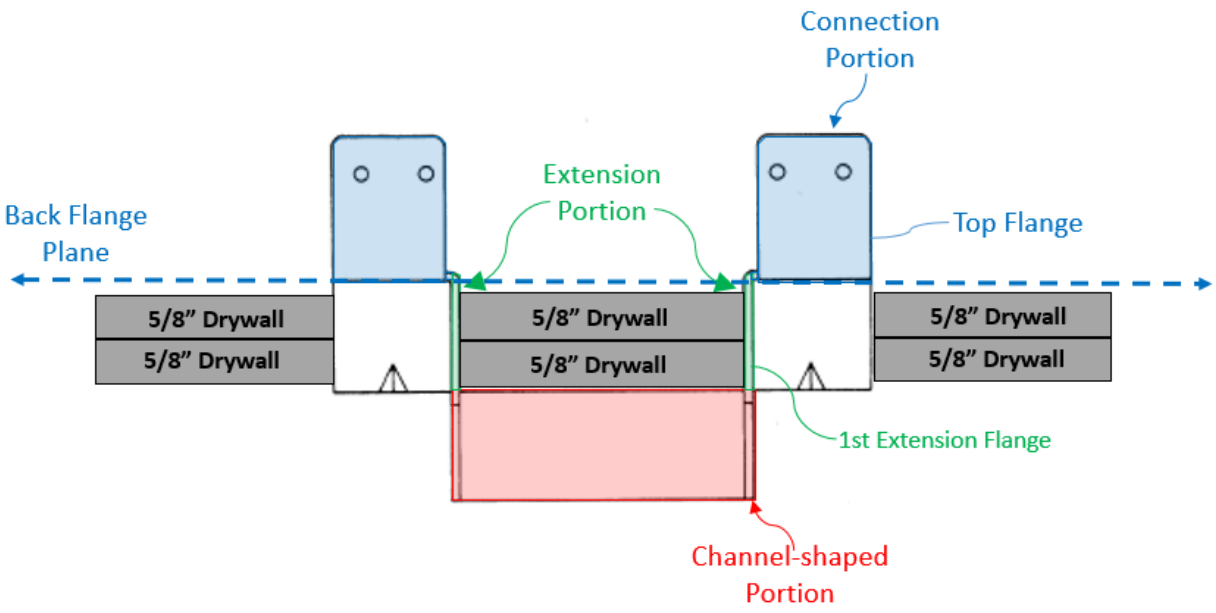
(red), as taught by Bundy. EX1003, ¶103; EX1007, 5:18-20. In doing so, a POSITA would have understood that Yamaguchi's extension portion (green) is configured to extend into one side of the drywall and out of the other side of the drywall because Yamaguchi's extension portion is flat sheet metal extending continuously from its channel-shaped portion to its connection portion, just as the extension flanges described in the '626 patent. EX1003, ¶103. Thus, Yamaguchi's extension portion is configured to extend through the two layers of 5/8-inch-thick drywall. EX1003, ¶¶103-104.



EX1041, Perspective View (annotated).



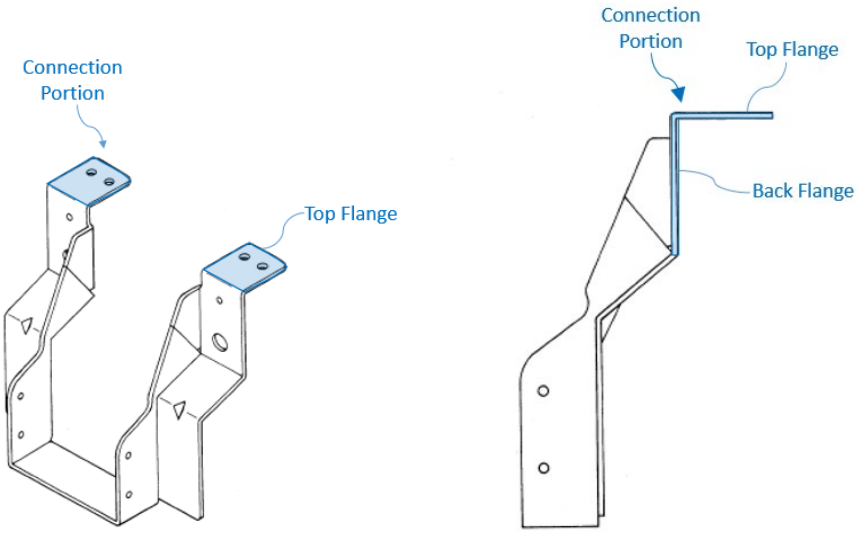
EX1041, Side View (annotated).



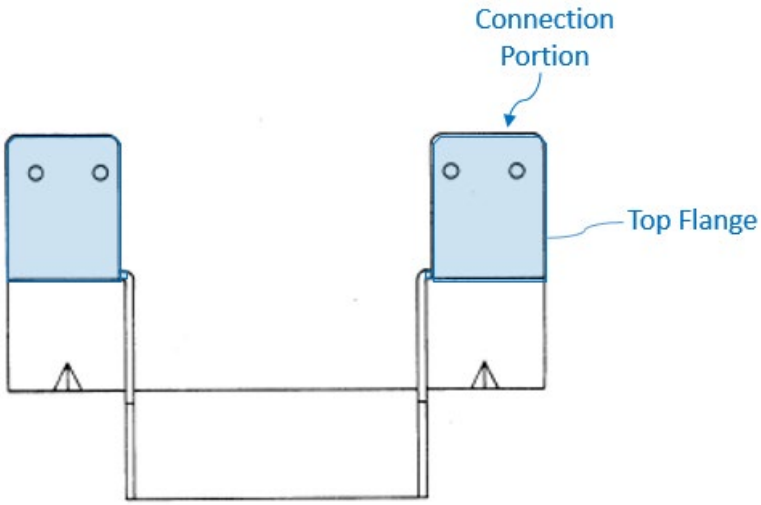
EX1041, Plan View (annotated).

[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 for claim 1, element [1.2.A], Yamaguchi-Bundy renders obvious this limitation. EX1003, ¶105; EX1041, 2–5.



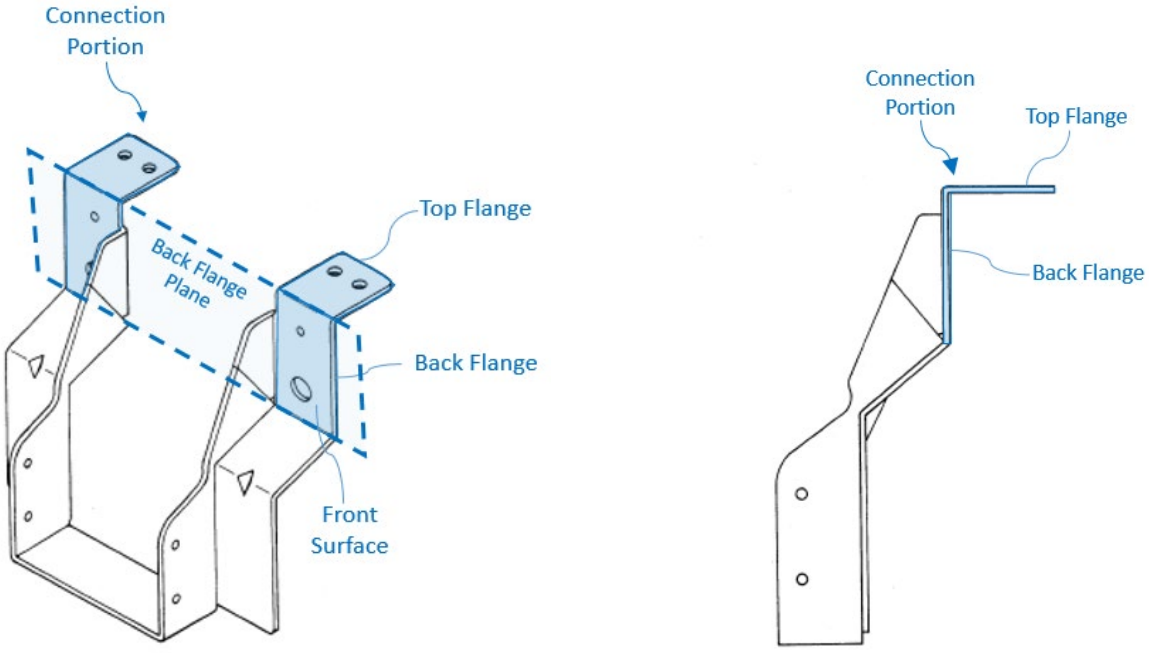
EX1041, Perspective, Side Views (annotated).



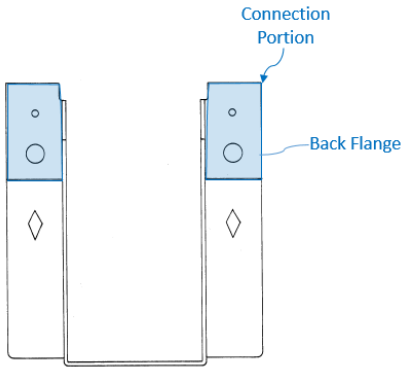
EX1041, Plan View (annotated).

[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 for claim 1, element [1.2.B], Yamaguchi-Bundy renders obvious this limitation. EX1003, ¶106; EX1041, 2–5.



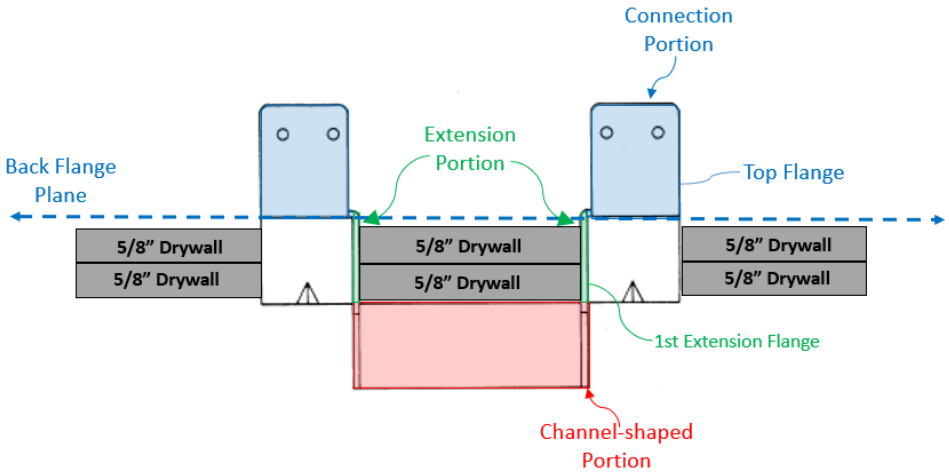
EX1041, Perspective, Side Views (annotated).



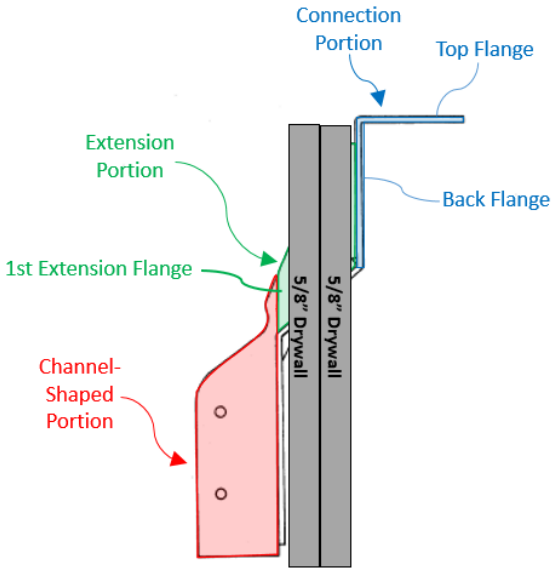
EX1041, Front View (annotated).

[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 for claim 1, element [1.3.B], Yamaguchi–Bundy renders obvious this limitation. EX1003, ¶107; EX1041, 2–5.



EX1041, Plan View (annotated).



EX1041, Side View (annotated).

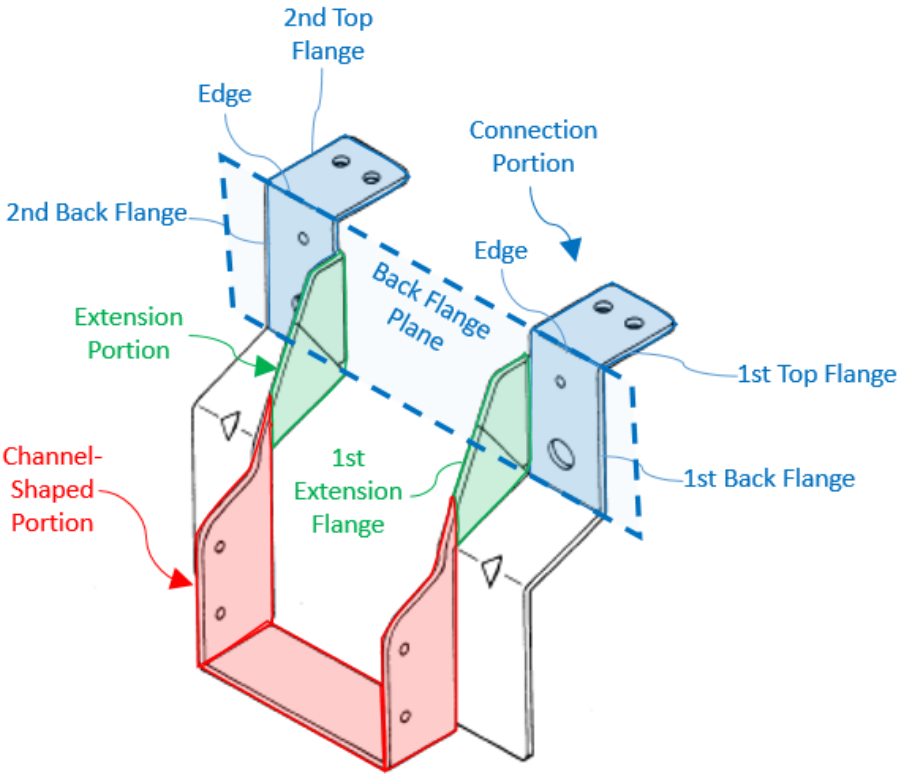
[53.5] "wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another"

As discussed for claim 1, element [1.4], Yamaguchi discloses this limitation. EX1003, ¶108; EX1041, 1–5.

D. Claims 39 and 92

Yamaguchi discloses that the back flange (blue) is a first back flange (right back flange) and the top flange (blue) is a first top flange (right top flange). EX1041, 2–5. When mounted on a frame wall as taught by Bundy, Yamaguchi-Bundy discloses that the connection portion (blue) includes a second top flange (left top flange) arranged to engage the top surface of the top plate of the frame wall and a second back flange (left back flange) extending from an edge (annotated below) of the second top flange and arranged to engage the vertical face of the top plate of the frame wall, shown below. Being constructed from sheet metal and symmetric with the first back flange[4], Yamaguchi's second back flange has a front surface lying in the same back flange plane as the first back flange. EX1041, 2–5; EX1003, ¶¶109-110.

[4] "The left side view is symmetrical to the right side view." EX1041, 1.

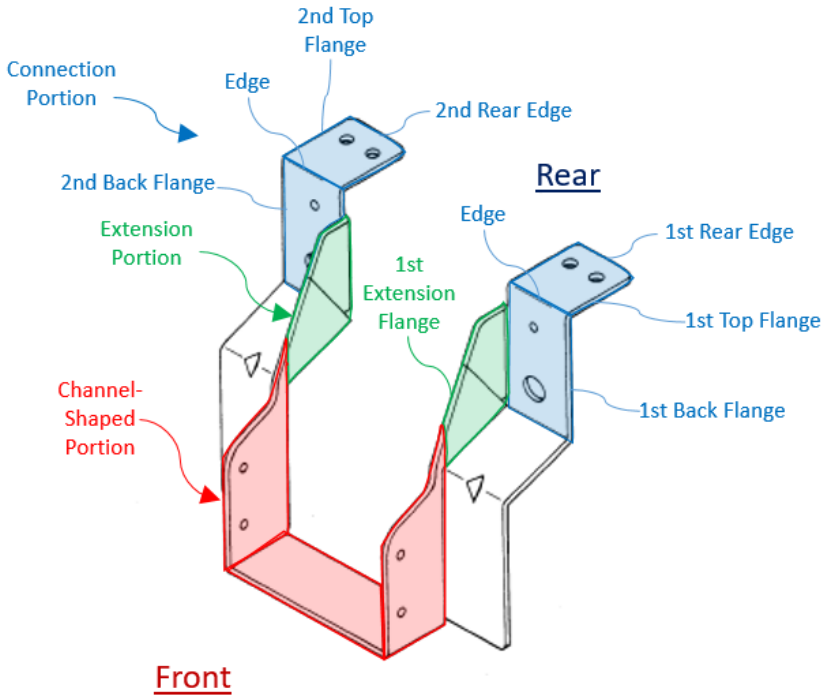


EX1041, Perspective View (annotated).

E. Claims 40 and 93

Yamaguchi discloses that the first top flange includes a first rear edge (annotated below) located rearwardly of the edge (annotated below) of the first top flange from which the first back flange extends and that the second top flange includes a second rear edge (annotated below) located rearwardly of the edge (annotated below) of the second top flange from which the second back flange extends. EX1041, 2–5; EX1003, ¶111. Yamaguchi discloses the first rear edge (annotated below) being located rearwardly of the first back flange and the second

rear edge (annotated below) being located rearwardly of the second back flange. EX1041, 2–5; EX1003, ¶¶111-112.

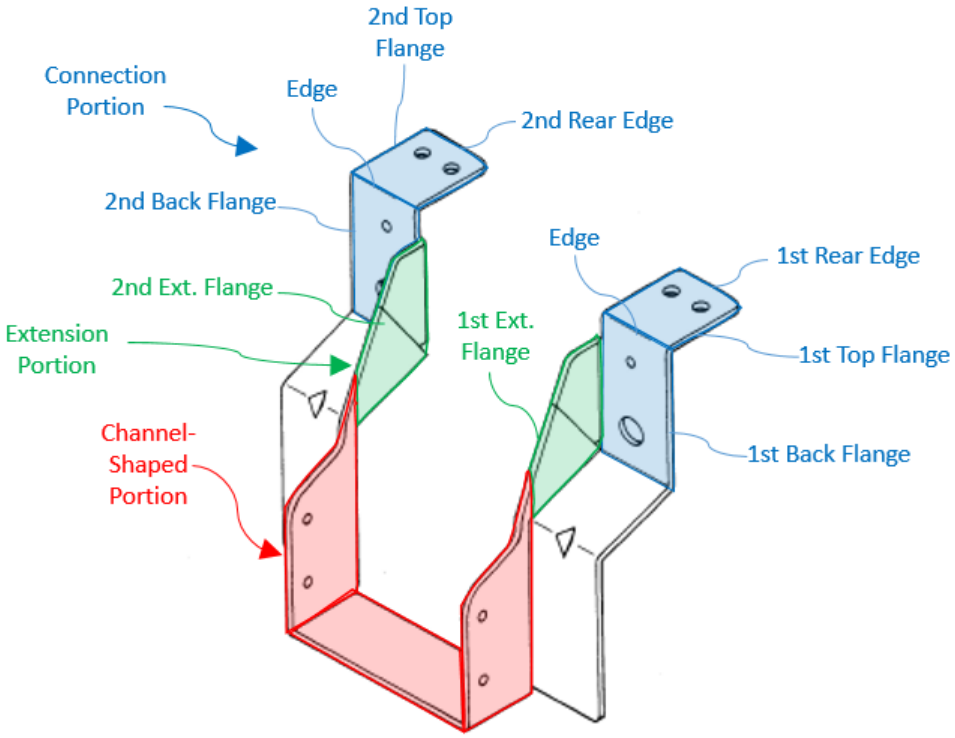


EX1041, Perspective View (annotated).

F. Claims 41 and 94

For the reasons discussed for [1.3.A], Yamaguchi discloses that the extension portion (green) includes a first extension flange (right extension flange) extending from the channel-shaped portion to the first back flange of the connection portion (and vice-versa, from the first back flange to the channel-shaped portion). As the two sides of Yamaguchi's hanger are symmetric, Yamaguchi similarly discloses a second extension flange (left extension flange) extending from the second back flange to the channel-shaped portion (and vice-

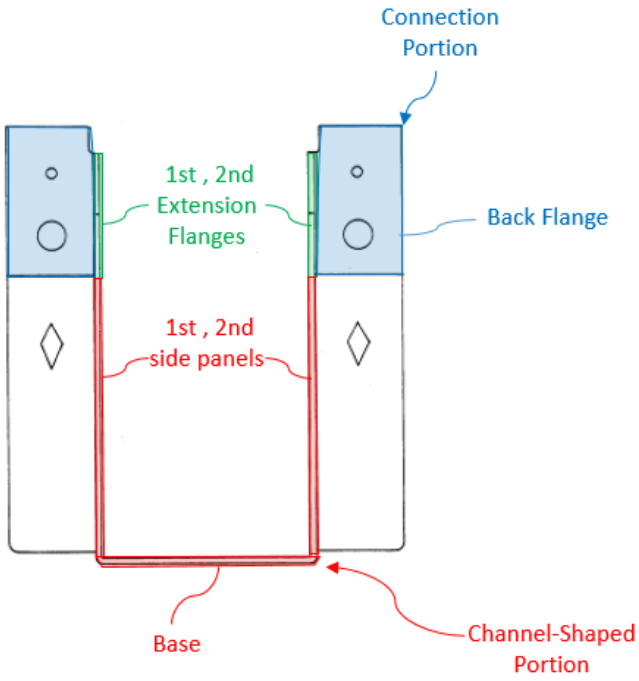
versa, from the channel-shaped portion to the second back flange), shown below. EX1041, 2–5, EX1003, ¶¶113-114.



EX1041, Perspective View (annotated).

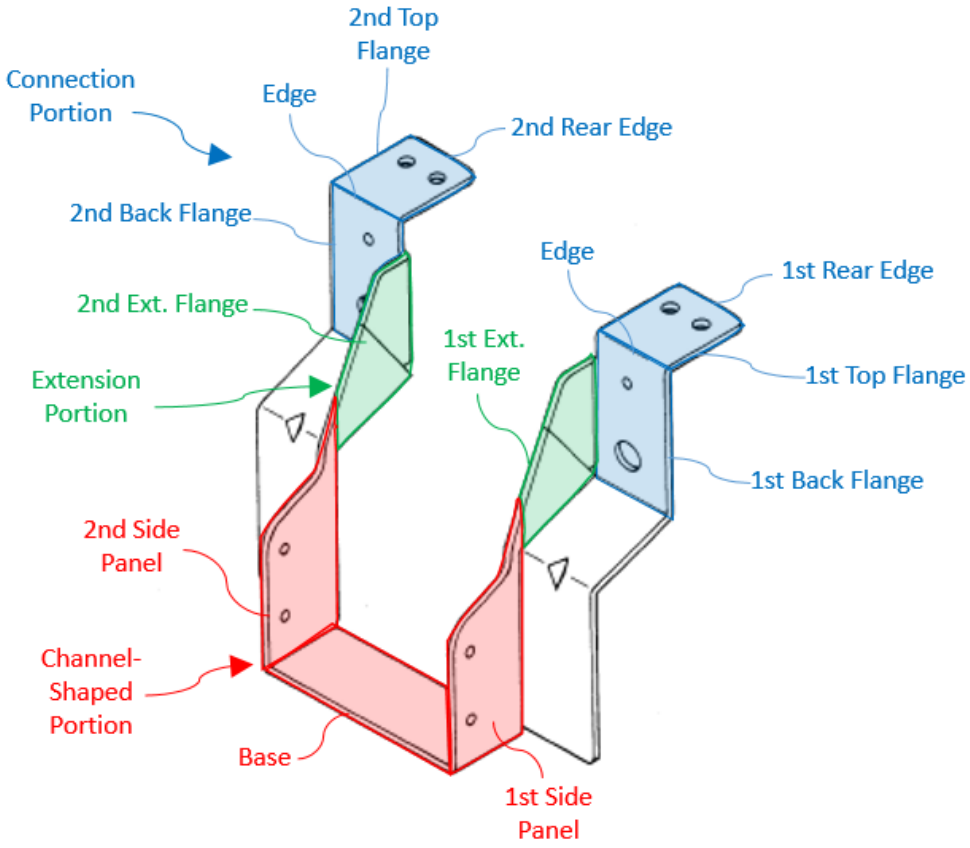
G. Claims 42 and 95

Yamaguchi discloses the channel-shaped portion 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"). Yamaguchi discloses that the channel-shaped portion further includes first and second side panels (red, annotated below) extending upward from the base. EX1041, 2–5; EX1003, ¶115.



EX1041, Front View (annotated).

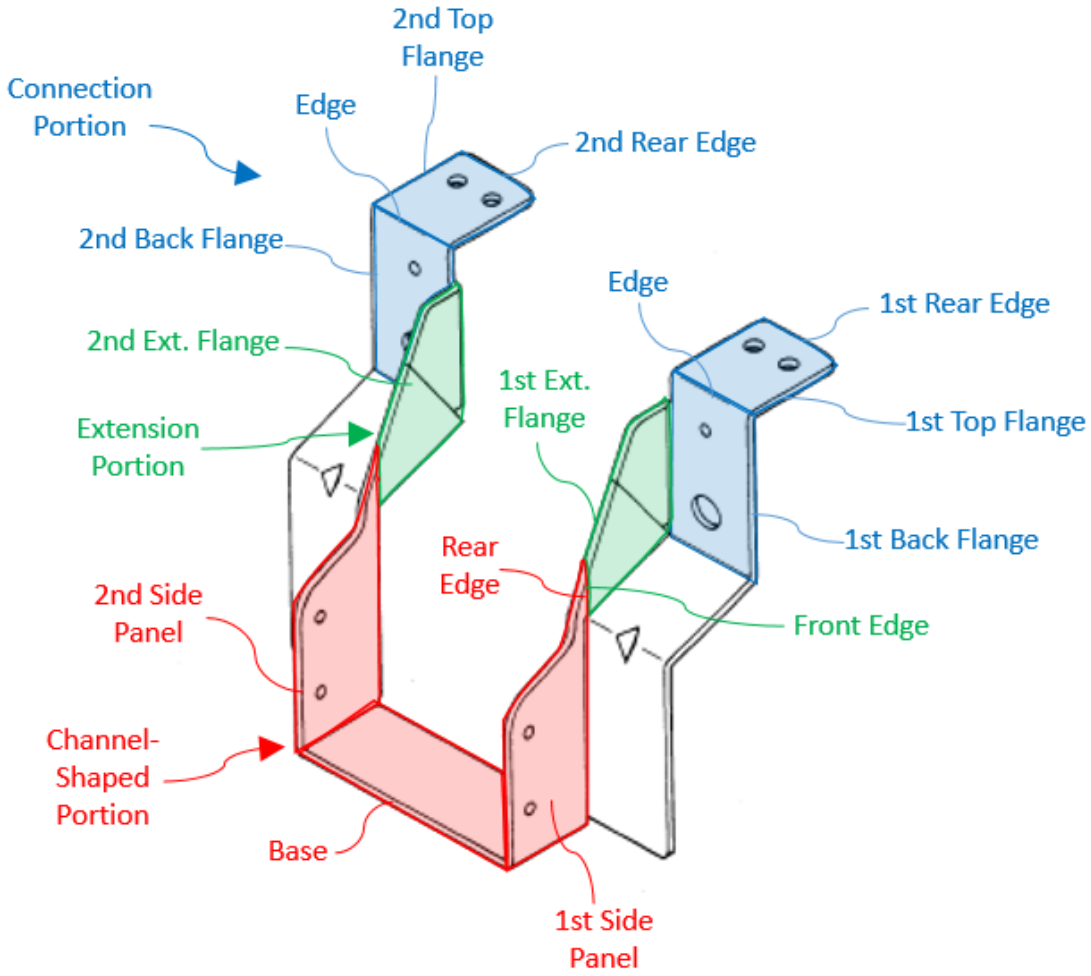
Yamaguchi discloses that its extension flanges are parallel to each other and that its side panels are parallel to each other ("[t]he left side view is symmetrical to the right side"), and thus the second extension flange is parallel to the first extension flange and the second side panel is parallel to the first side panel, shown below. EX1041, 1-5; EX1003, ¶¶116–117.



EX1041, Perspective View (annotated).

H. Claims 43 and 96

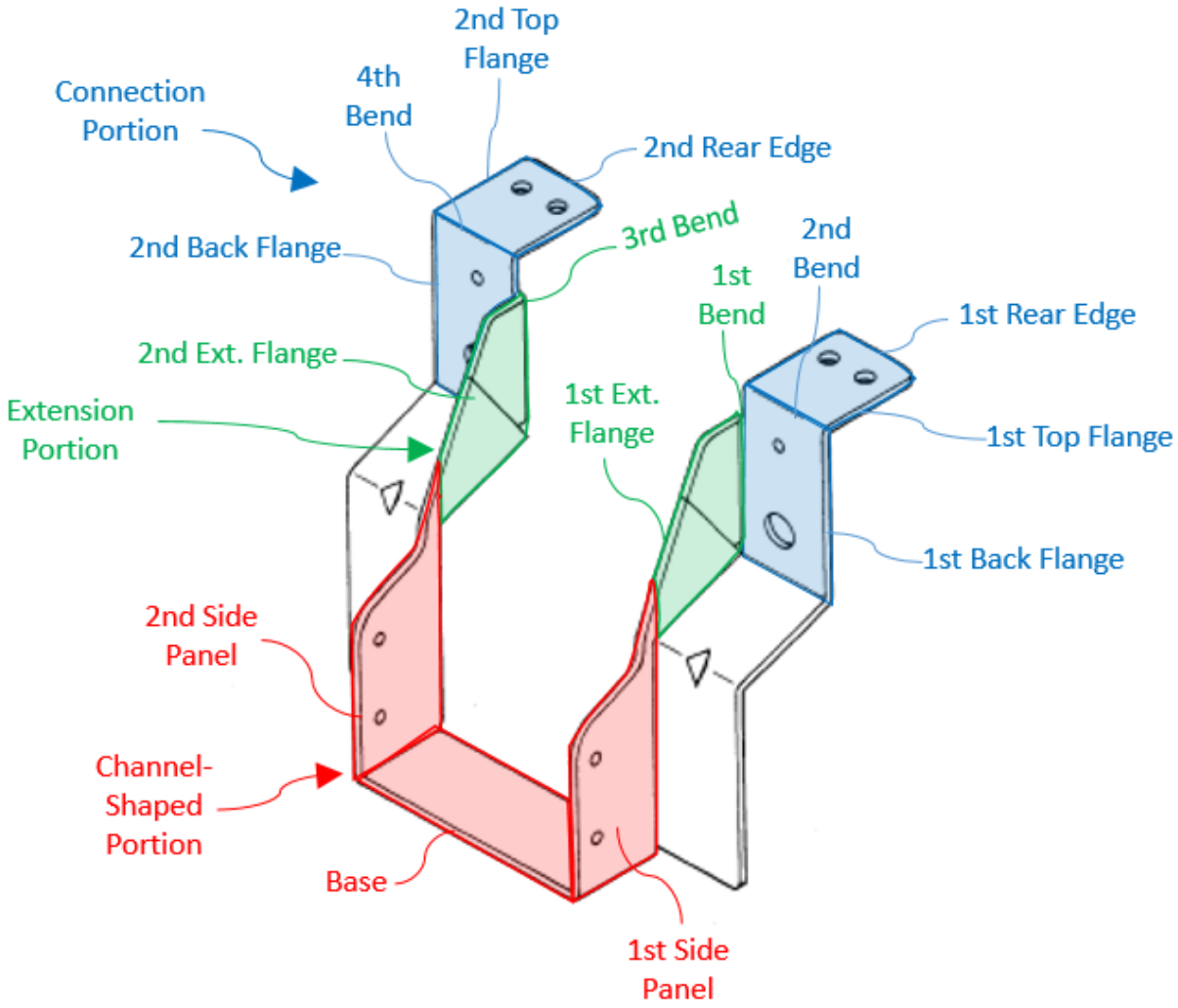
Yamaguchi discloses a front edge (annotated below) of the first extension flange abuts a rear edge (annotated below) of the first side panel, as they join with no intervening structures therebetween. EX1041, 2–5; EX1003, ¶¶118–119.



EX1041, Perspective View (annotated).

I. Claims 44 and 97

Yamaguchi discloses that the first extension flange and the first back flange are directly attached to each other by a first bend (annotated below) and that the first back flange and the first top flange are directly attached to each other by a second bend (annotated below). EX1041, 2–5; EX1003, ¶120.



EX1041, Perspective View (annotated).

Yamaguchi discloses that the second extension flange and the second back flange are directly attached to each other by a third bend (annotated above) and that the second back flange and the second top flange are directly attached to each other by a fourth bend (annotated above). EX1041, 2–5; EX1003, ¶121.

VI. Claims 22–27, 45, 50–52, 74–79, 98, and 103–105 Would Have Been Obvious Over Yamaguchi In View Of Bundy, Further In View Of Adams.

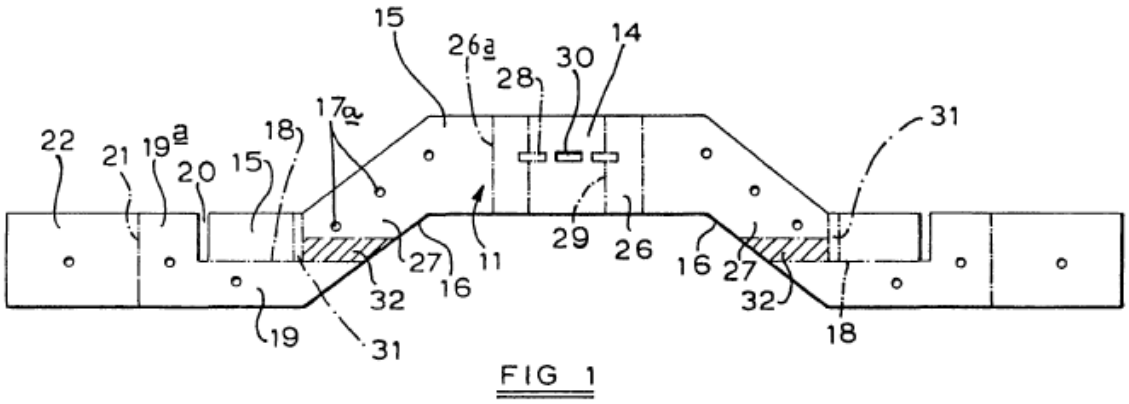
As discussed above, each element of independent claims 1 and 53 would have been obvious based on Yamaguchi-Bundy. EX1003, ¶¶122–123.

A. Motivation to Modify Yamaguchi, as Modified by Bundy, Based on the Teachings of Adams.

Yamaguchi, Bundy, and Adams are all directed to joist hangers. EX1003, ¶124. Accordingly, a POSITA would have recognized that the teachings of Adams are analogous to both Yamaguchi's and Bundy's hanger. EX1003, ¶124. While Yamaguchi does not explicitly disclose how its hanger is manufactured, a POSITA would have understood that Yamaguchi's hanger may be manufactured by two alternative processes: (1) folding one piece of sheet metal, or (2) cutting and combining two pieces of metal. EX1003, ¶130; EX1040, 1:12–14. A POSITA would have been motivated to manufacture Yamaguchi's hanger by folding a single piece of sheet metal in view of Adams. EX1003, ¶¶124; EX1040, 3:55–58.

Adams teaches manufacturing a joist hanger "from a single sheet metal blank 11," shown below in Figure 1. EX1040, 3:55–58. In doing so, Adams teaches that "[a] series of blanks can be cut side-by-side from a metal sheet without substantial wastage." EX1040, 6:2–3. A POSITA would have understood in view of Adams that forming a hanger as a single piece of sheet metal that is then bent

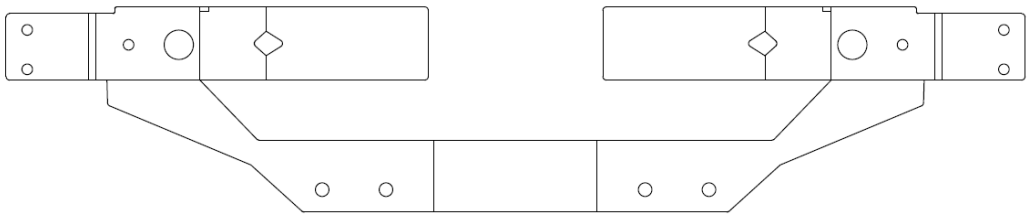
into shape provides the most pragmatic, economically-efficient way to manufacture a high number of hangers. EX1003, ¶125. Thus, a POSITA would have been motivated to form Yamaguchi's hanger as one of piece of sheet metal, as taught by Adams, to yield a hanger with less wastage and manufacturing complexity. EX1003, ¶125; EX1040, 5:55–6:3.



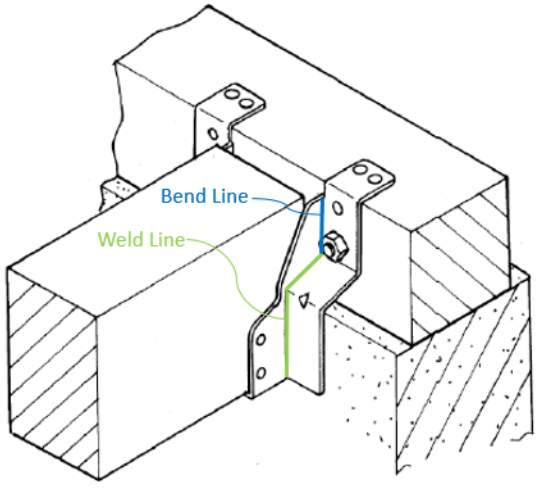
EX1040, FIG. 1.

A POSITA would have had a reasonable expectation of success in doing so because Adams provides a blueprint (Figure 1) for sectioning a single of piece of metal into a hanger having a shape—specifically, a channel-shaped portion, an extension portion, and a connection portion—analogous to Yamaguchi's hanger. EX1003, ¶126; EX1040, 3:55–58, 6:4–22. A POSITA would have been able to determine, using common CAD tools, how to create a single sheet blank that maintains the fundamental shape of the Yamaguchi's hanger, as demonstrated below. EX1003, ¶127. Indeed, a POSITA would have understood that the bend line

(blue, annotated below) between Yamaguchi's extension flanges and back flanges allows the hanger to be formed as one continuous metal piece, and that, once bent into shape, the free edge of Yamaguchi's laterally-extending flanges would be welded to the edges (green, annotated below) of the extension flange and channel-shaped portion to reinforce the hanger and maintain its shape. EX1003, ¶127. Doing so would have been well within the level of ordinary skill in the art, as use of a known technique (forming as one piece of sheet metal) to improve similar devices (the Yamaguchi-Bundy hanger) in the same way. EX1003, ¶¶127-128.



EX1003, ¶127, rendering of metal blank for Yamaguchi's hanger.



EX1041, Usage View (annotated).

B. Claims 22-27 and 74-79

As discussed above, claims 1 and 53, from which claims 22-27 and 74-79 respectively depend, would have been obvious based on Yamaguchi in view of Bundy. As Yamaguchi is a joist hanger, a POSITA would have understood from Yamaguchi in view of Bundy that the combined hanger is made of sheet metal. EX1003, ¶129. While Yamaguchi and Bundy are silent about the hanger's manufacturing process, Adams discloses forming a joist hanger's extension portion (sidewalls 15 above edge 16), including its first extension flange (first sidewall 15 above edge 16), its channel-shaped portion (base 14 and portions of sidewalls 15 thereabove), and its connection portion (abutment and bearing portions 19, 22) all as one-piece of sheet metal (blank 11). EX1040, 3:55–57, 6:3–22; *see also* §§VIII.B–C below. Employing the teachings of Adams's manufacturing process with the Yamaguchi-Bundy hanger would have rendered obvious (1) the hanger's extension portion, including its first extension flange, and channel-shaped portion being formed as one-piece of sheet metal (claims 22/26/74/78); (2) the hanger's extension portion, including its first extension flange, and connection portion being formed as one-piece of sheet metal (claims 23/75); and (3) the hanger's channel-shaped portion, connection portion, and extension portion, including its first extension flange, being formed as one-piece of sheet metal (claims 24/27/76/79), as illustrated in the metal-blank rendering above. EX1003, ¶130. A POSITA would

have been motivated and had a reasonable expectation of success in doing so for the reasons set forth in §VI.A.

For the same reasons, employing the teachings of Adams's manufacturing process with the Yamaguchi-Bundy hanger would also have rendered obvious the hanger's channel-shaped portion being made of sheet metal, and the extension portion, including its first extension flange, being an extension of the sheet metal forming the channel-shaped portion (claims 25/77), as illustrated in the metal-blank rendering above. EX1003, ¶¶131–132.

C. Claims 45 and 98

As discussed above, claims 44 and 97, from which claims 45 and 98 respectively depend, would have been obvious based on Yamaguchi in view of Bundy. As discussed for claims 22-27 and 74-79, employing Adams's manufacturing with the Yamaguchi-Bundy hanger would have rendered obvious the hanger's channel-shaped portion, connection portion, and extension portion being formed as one-piece of sheet metal. EX1003, ¶133; EX1040, 3:55–57, 4:2–36, 6:3–22.

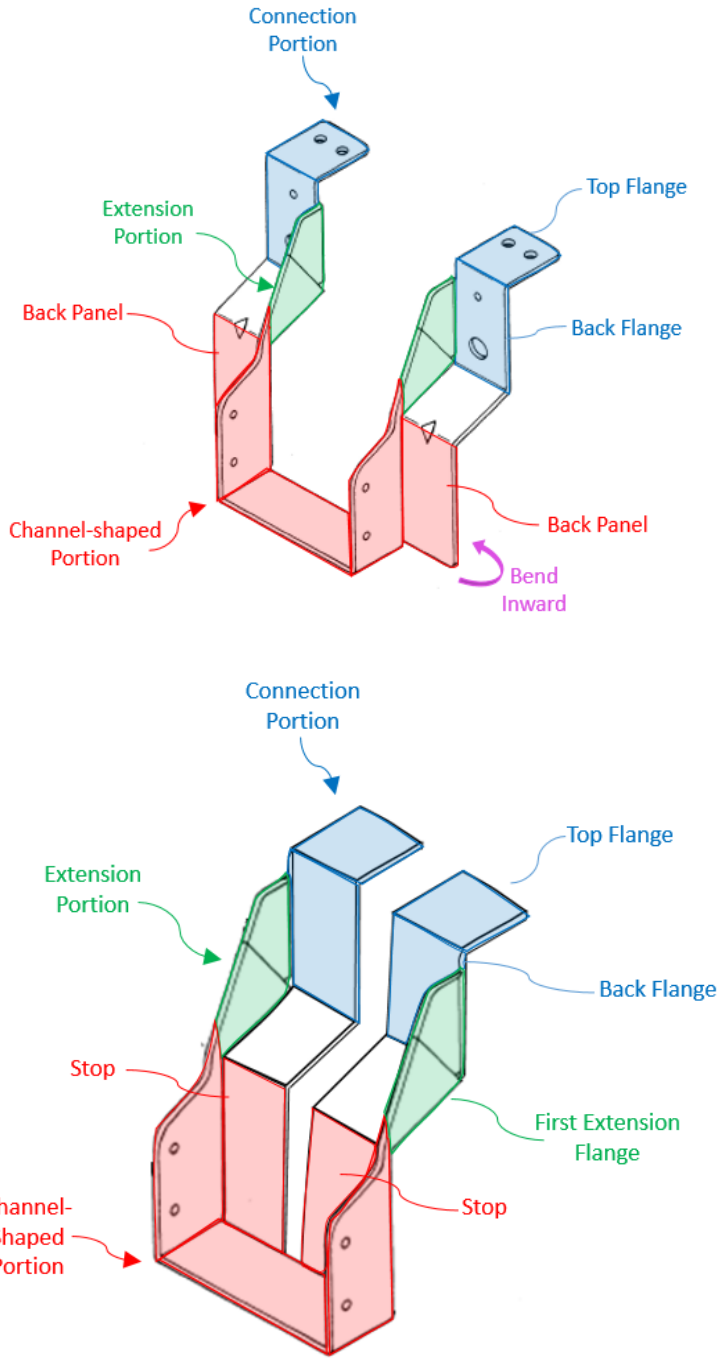
D. Claims 50 and 103

1) Stop Arranged To Engage an End of the Structural Component

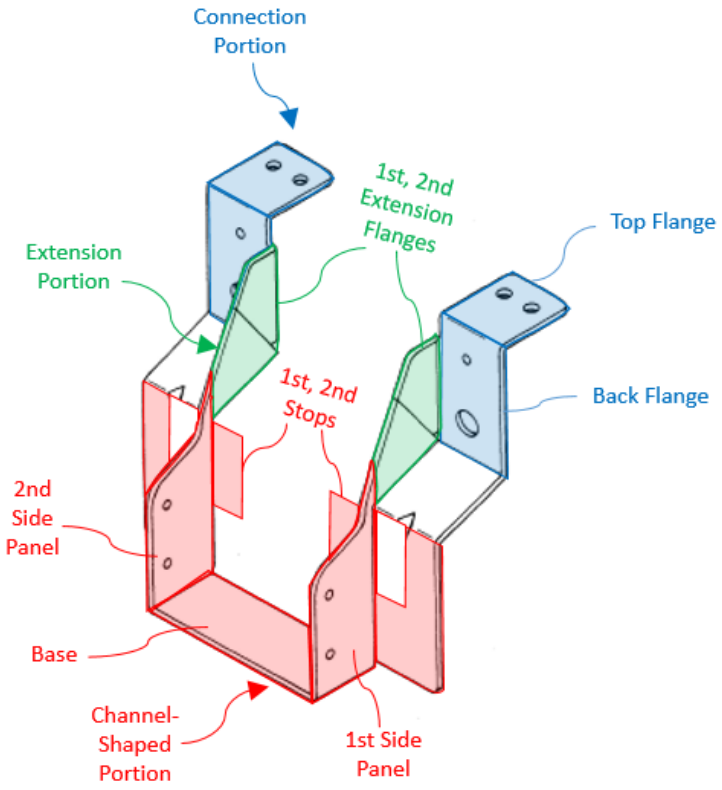
While Yamaguchi does disclose a space between the end of the joist and the wall structure top, Yamaguchi does not explicitly disclose a stop. However, as

discussed in §V.A, Bundy teaches an analogous hanger. Bundy discloses a stop (e.g., back plate members 9) engaging the end of the structural component and spacing it at the requisite distance by bending back plate members 9 inward from its side members 11. EX1007, 4:39-46; EX1003, ¶134. Bending back plate members 9 inward prevents a structural component installed thereon from extending past the back plate members, thereby acting as a stop.

Employing the teachings of Bundy's drywall space with Yamaguchi, a POSITA would have been motivated to bend Yamaguchi's outer flaps (entirely or cutout) inward to form first and second back panels, as taught by Bundy, to provide Yamaguchi's hanger 10 with a stop arranged to engage the joist's end, to ensure that joist's end is spaced from the back flange plane by the noted distance so it does not impair drywall installed into the drywall space defined therebetween (*see* VI.1.3.B and VI.53.4). EX1003, ¶¶134-135. Such a modification would have been applying a known technique (Bundy's teaching of bending flaps on the side of a channel-shaped portion inwards to face each other) to a known device (Yamaguchi's hanger having side flaps) to obtain a predictable result of Yamaguchi's hanger having flaps bent inwards to provide a stop at the joist's end. EX1003, ¶¶134-135.



EX1041, Perspective View (annotated, rendering).



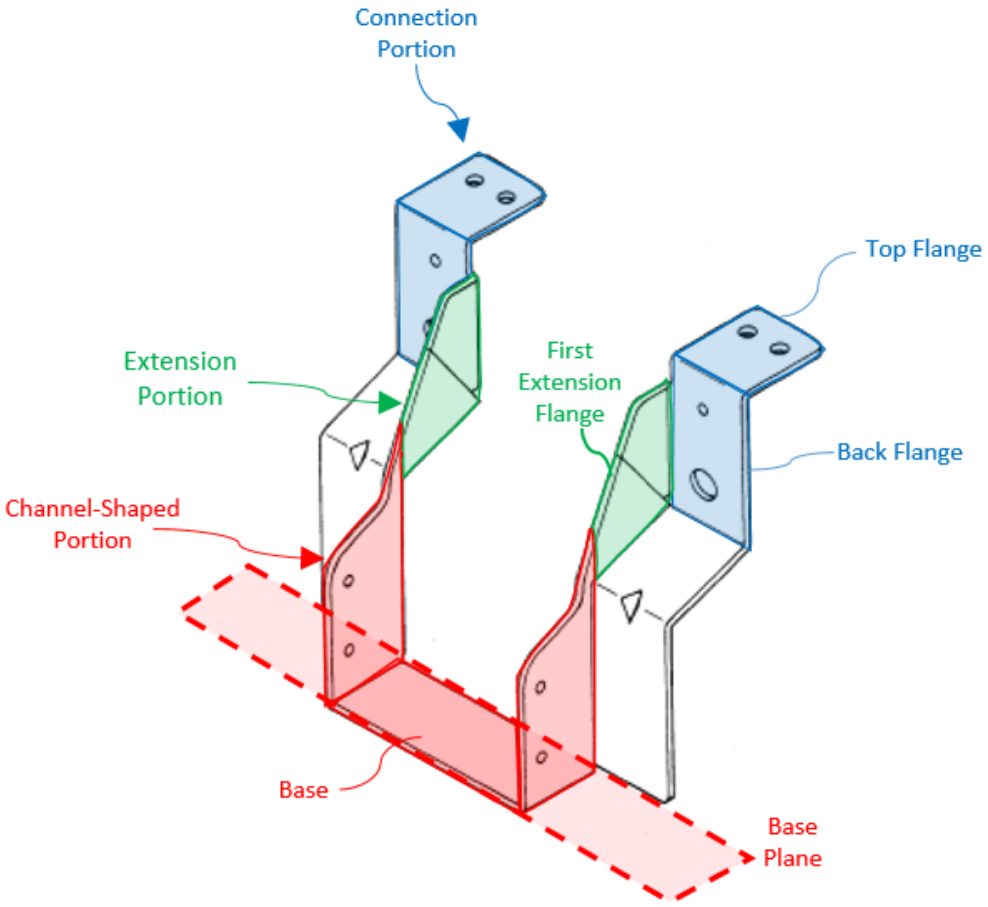
EX1041, Perspective View (rendering)

A POSITA would have had a reasonable expectation of success in providing Yamaguchi's hanger with a stop to engage and space the joist's end from its back flange because doing so was well within the level of ordinary skill in the art, as evidenced by Bundy. EX1003, ¶¶134-135; EX1007, 4:39-46; EX1008, ¶40.

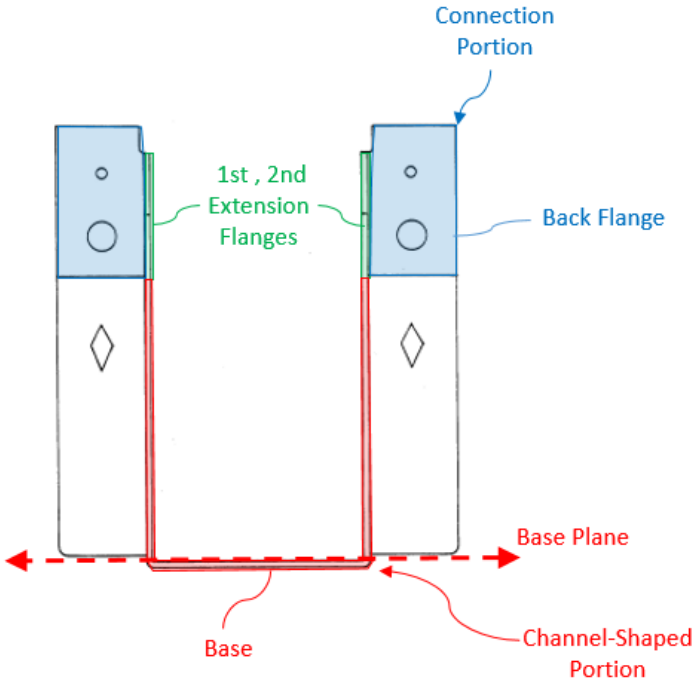
2) Base to Receive End Portion of Structural Component

As discussed above for claims 42 and 95, Yamaguchi discloses the channel-shaped portion including a base (annotated below) configured to receive and support the structural component's end portion. EX1041, 1–5; EX1003, ¶136. As illustrated below, Yamaguchi's base includes an upper surface lying in a horizontal

base plane and arranged to engage the structural component by receiving the end portion thereof. EX1041, 1–5; EX1003, ¶136.



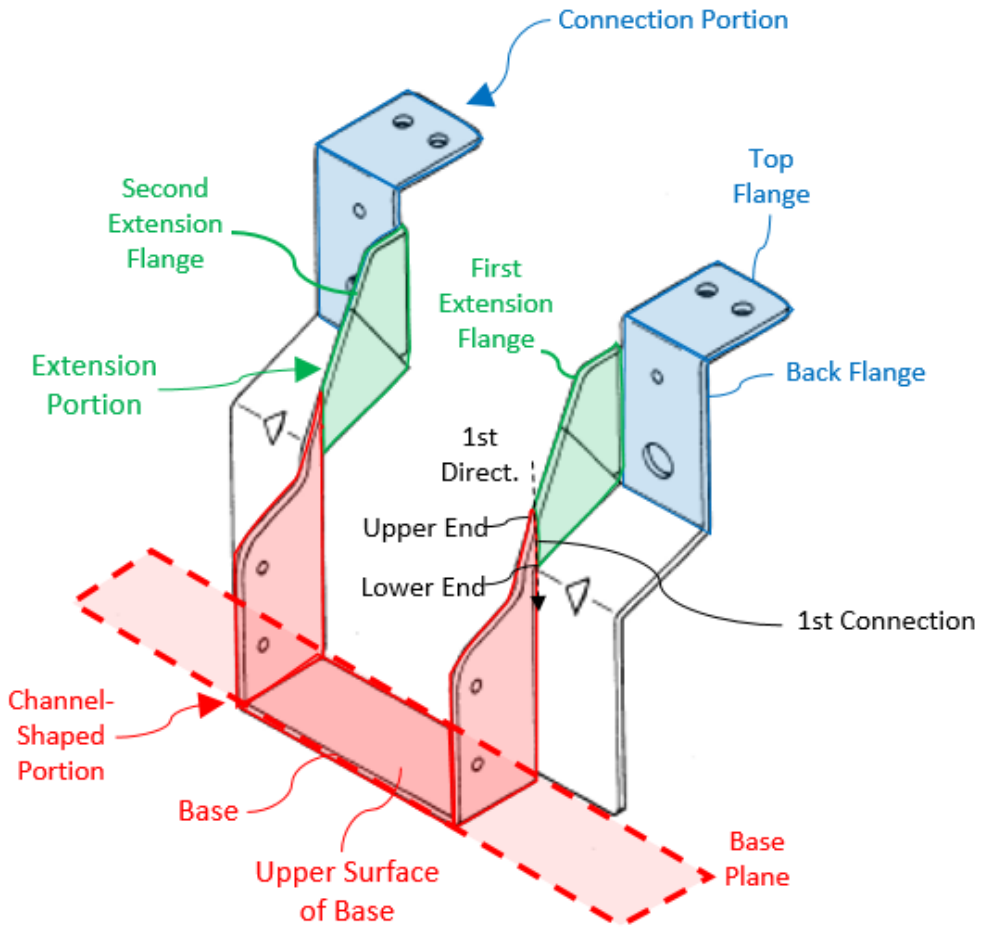
EX1041, Perspective View (annotated).



EX1041, Front View (annotated)

3) First Extension Flange Directly Attached to Channel-Shaped Portion

As discussed regarding claim 1, Yamaguchi discloses that the extension portion includes a first extension flange. Yamaguchi further discloses that the first extension flange is directly attached to the channel-shaped portion by a first connection (annotated below), as there are no intervening parts therebetween. EX1041, 2–5; EX1003, ¶137. The first connection has an upper end and a lower end and extends from the upper end to the lower end in a first direction (i.e., vertically or "downwardly") that is perpendicular to the horizontal base plane, shown below. EX1041, 2–5; EX1003, ¶137.

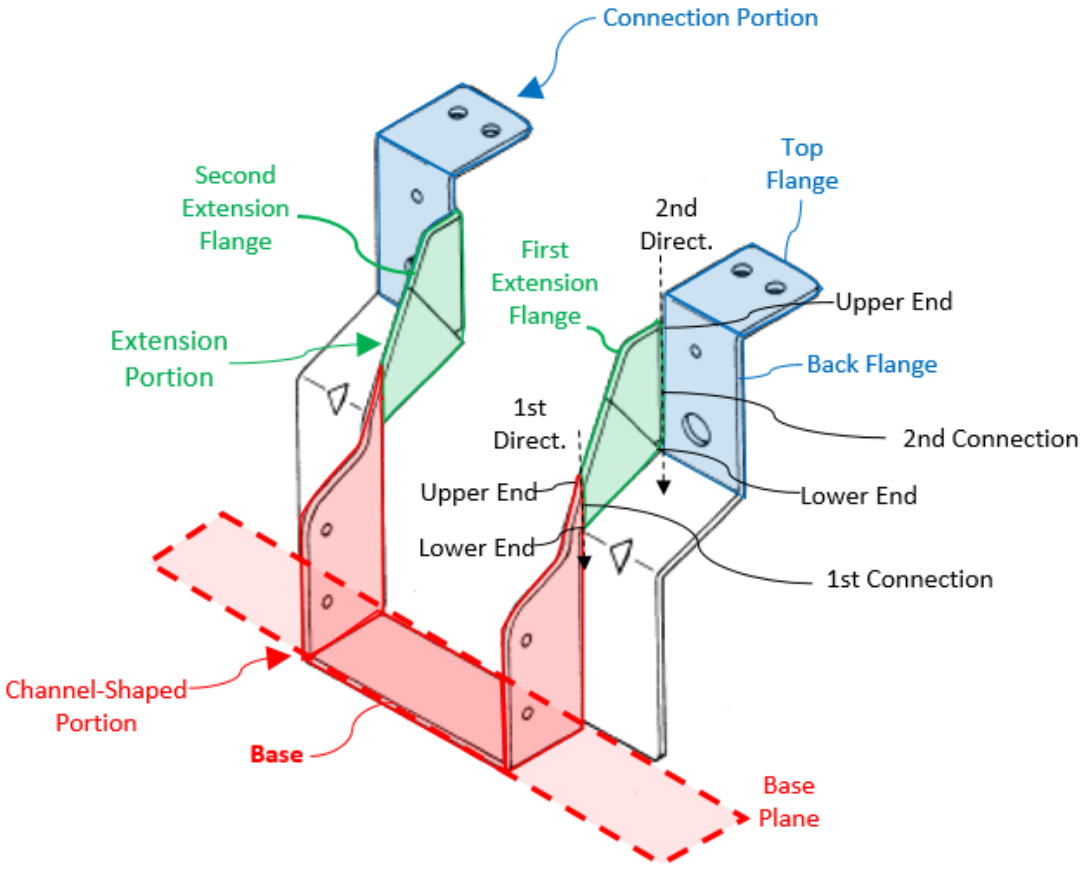


EX1041, Perspective View (annotated).

4) First Extension Flange Directly Attached to Connection Portion

Yamaguchi discloses that the first extension flange is directly attached to the connection portion by a second connection (annotated below), shown below, as no intervening components are therebetween. EX1041, 2–5; EX1003, ¶138. The second connection (annotated below) has an upper end (annotated below) and a lower end (annotated below) and extends from the upper end to the lower end in a second direction (annotated below) that is parallel to the first direction (i.e.,

vertical) and perpendicular to the horizontal base plane. EX1041, 2–5; EX1003, ¶138.



EX1041, Perspective View (annotated)

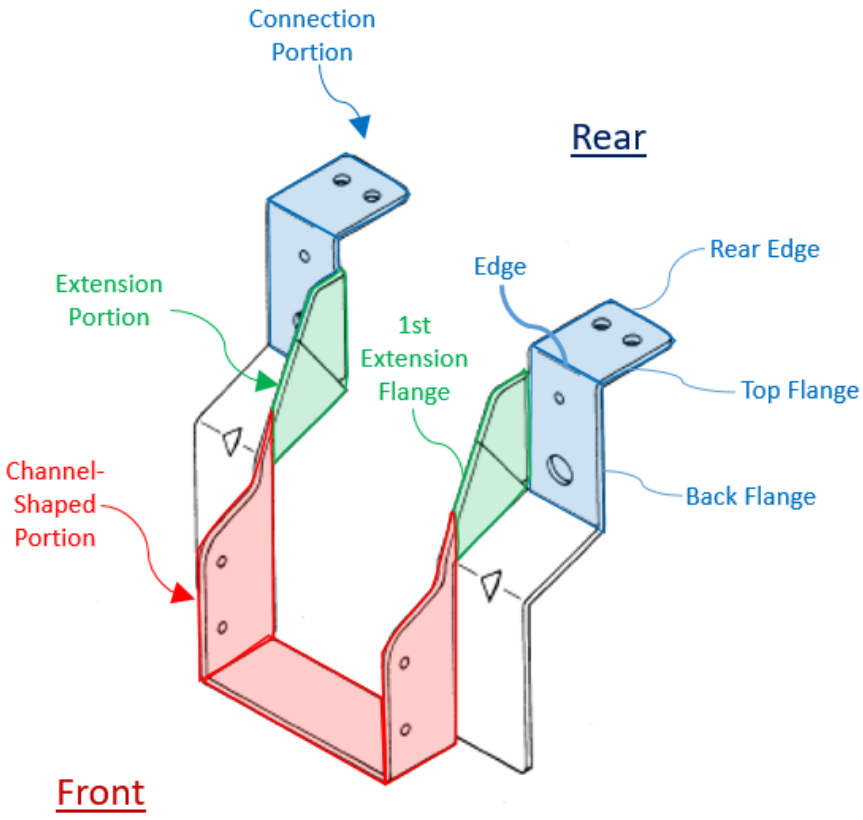
5) First Extension Flange and Channel-Shaped Portion as One Piece

As discussed for claims 22-27 and 74-79, employing the teachings of Adams's manufacturing process with Yamaguchi-Bundy would have rendered obvious Yamaguchi-Bundy's extension portion, including its first extension flange,

and channel-shaped portion being formed as one-piece of sheet metal. EX1003, ¶139; EX1040, 3:55–57, 4:2–6.

6) Top Flange's Rear Edge

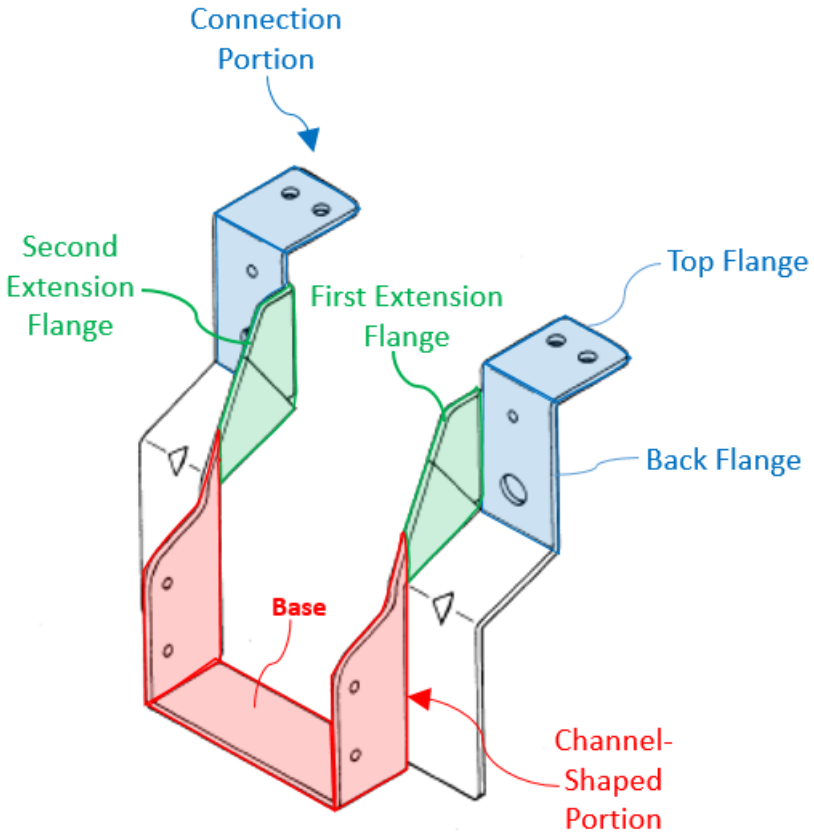
Yamaguchi discloses that the top flange includes a rear edge (annotated below) located rearwardly of the edge of the top flange (annotated below) from which the back flange extends, the rear edge (annotated below) located rearwardly of the back flange. EX1041, 2-5; EX1003, ¶140.



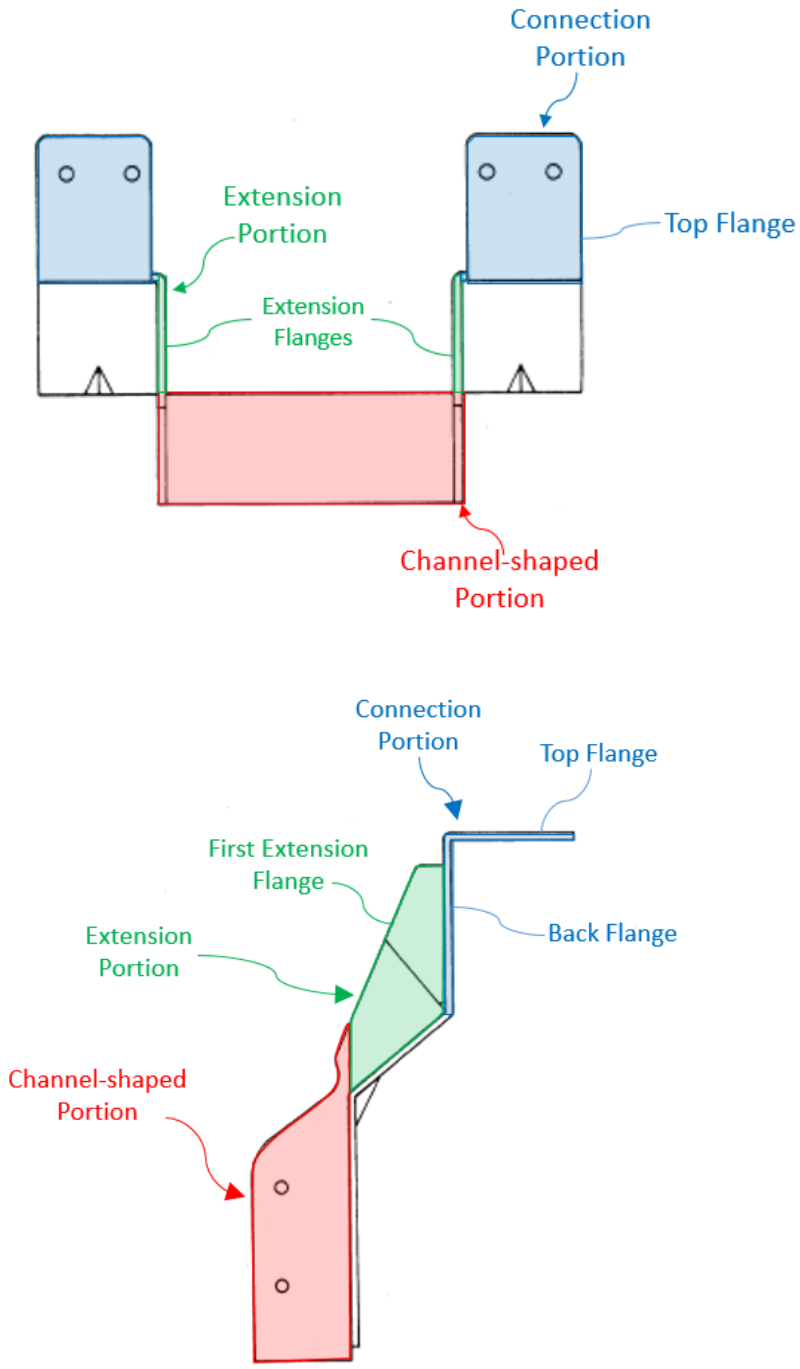
EX1041, Perspective View (annotated).

7) Channel-shaped Portion Spaced Apart From Connection Portion

Yamaguchi discloses the channel-shaped portion and the connection portion are spaced apart from one another by the distance defined by the extension portion (green) extending therebetween – long enough to allow two layers of 5/8" drywall to be inserted, as taught by Bundy. EX1041, 2–5; EX1003, ¶¶141-142.



EX1041, Perspective View (annotated).

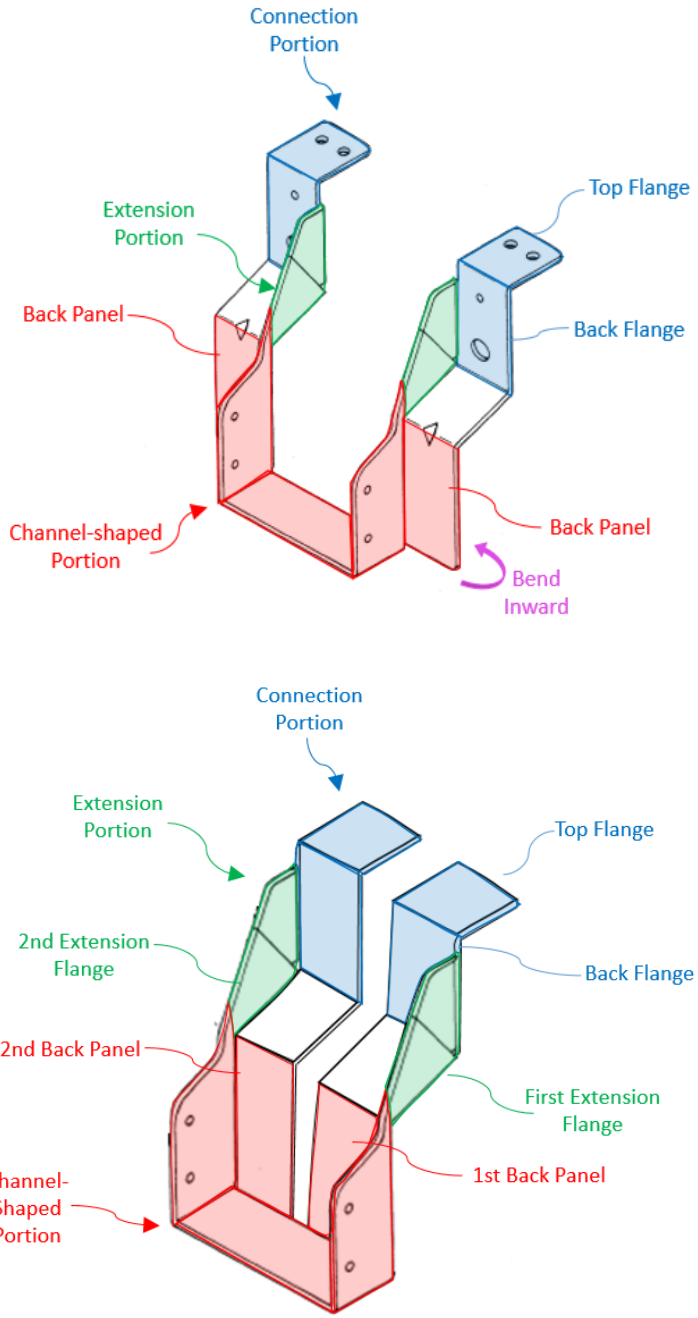


EX1041, Plan, Side Views (annotated).

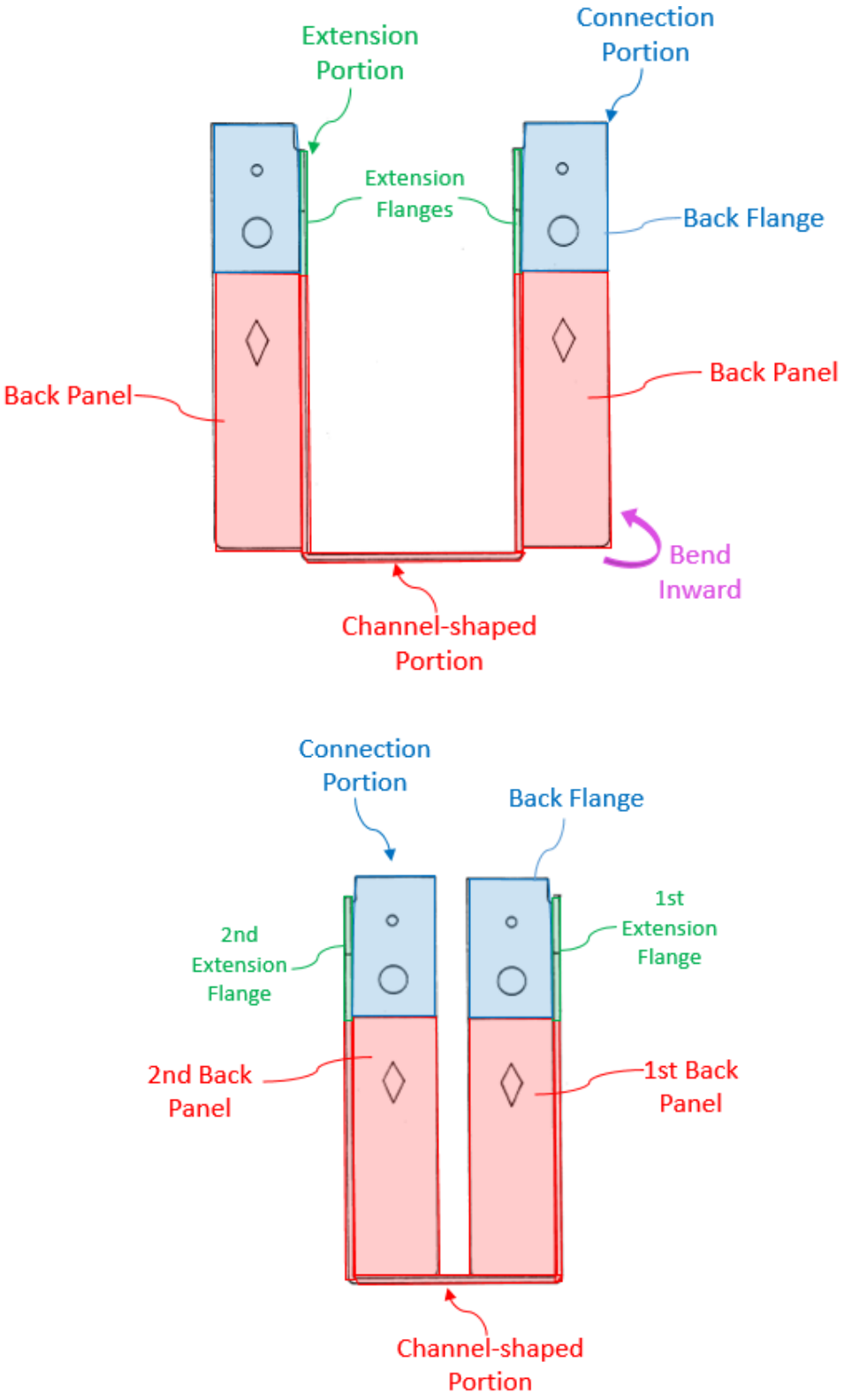
E. Claims 51 and 104

1) Stop Comprising First and Second Back Panels

As discussed for claims 50 and 103, modifying Yamaguchi's hanger to include inward-bent back plate members as taught by Bundy would have resulted in first and second back panels extending toward each other. EX1003, ¶143; EX1007, 4:39-46.



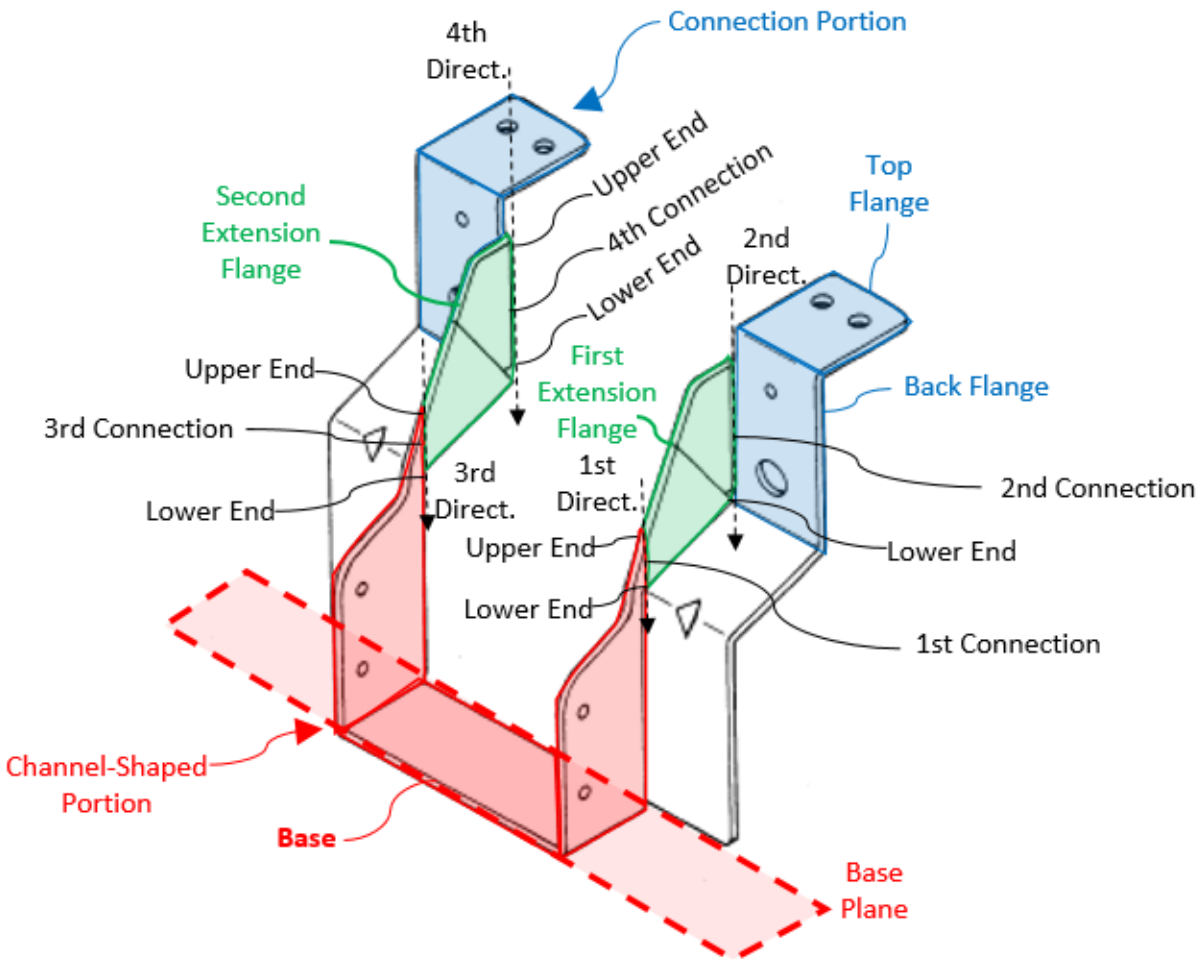
EX1041, Perspective View (annotated, rendering).



EX1041, Front View (annotated, rendering).

2) Second Extension Flange

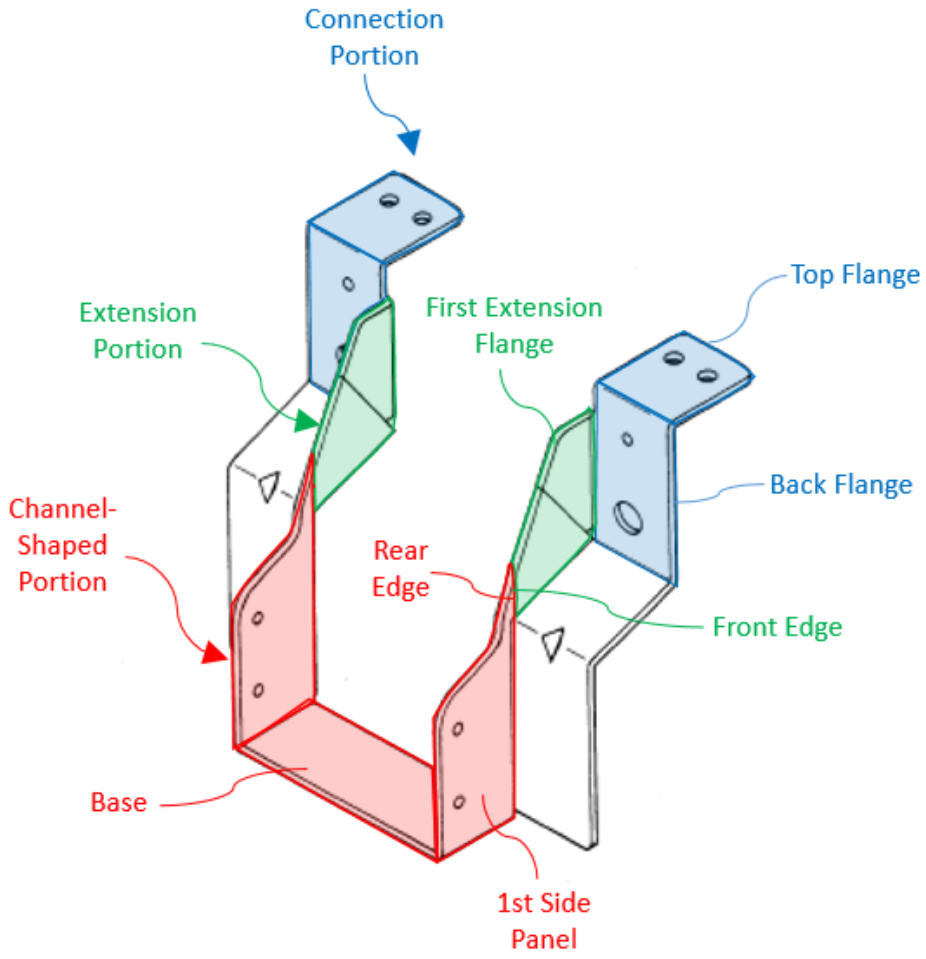
As discussed for claims 41 and 94, Yamaguchi discloses a second extension flange extending from the connection portion to the channel-shaped portion. The second extension flange is directly attached to the channel-shaped portion by a third connection (annotated below) and to the connection portion by a fourth connection (annotated below) as no intervening components are therebetween. EX1041, 2–5; EX1003, ¶144. The third and fourth connections (annotated below) each have an upper end and a lower end and extending from the upper end to the lower end in a third direction and fourth direction, respectively, as shown below. EX1041, 2–5; EX1003, ¶144. As the first and second extension flanges are symmetrical, Yamaguchi discloses the third and fourth directions being parallel to the first and second directions (i.e., vertical) and being perpendicular to the base plane, shown below. EX1041, 1–5; EX1003, ¶144.



EX1041, Perspective View (annotated).

3) First Side Panel

As discussed for claims 42 and 95, Yamaguchi discloses the channel-shaped portion including a first side panel (annotated below) extending upward from the base (annotated below). EX1041, 2–5; EX1003, ¶145. Yamaguchi discloses a front edge (annotated below) of the first extension flange abutting a rear edge (annotated below) of the first side panel, as they join with no intervening structures therebetween. EX1041, 2–5; EX1003, ¶145.

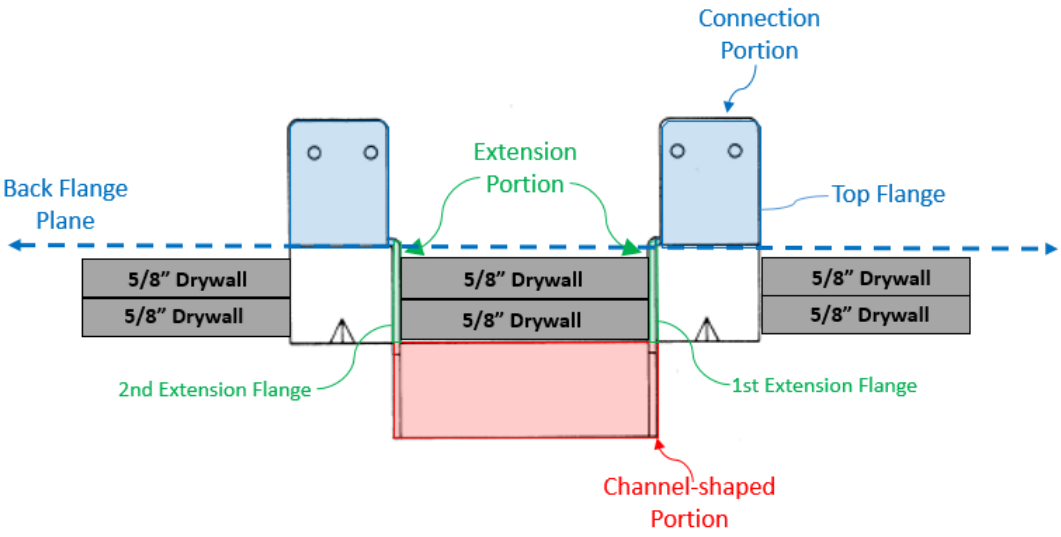


EX1041, Perspective View (annotated).

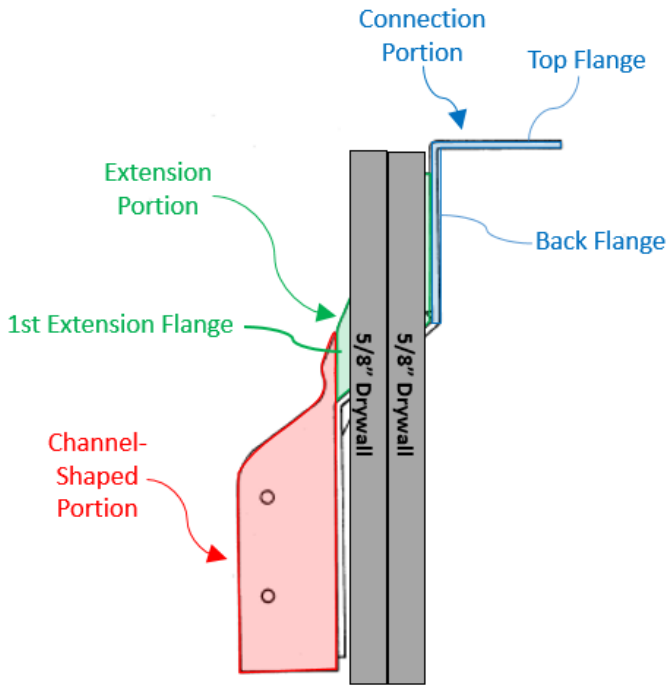
4) Drywall Space

Employing the teachings of Bundy's drywall space with Yamaguchi's hanger renders obvious a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein. EX1007, 5:10–22; EX1003, ¶146. As the channel-shaped portion and back flange plane (defined by the back flange) of Yamaguchi-Bundy define the drywall space's size and shape, they bound the drywall space. EX1041, 2–5; EX1007, 5:10-22; EX1003, ¶¶146-147. Because the

first and second extension flanges of Yamaguchi-Bundy further define the drywall space's size and shape, they also bound the drywall space. *Id.*



EX1041, Plan View (annotated).

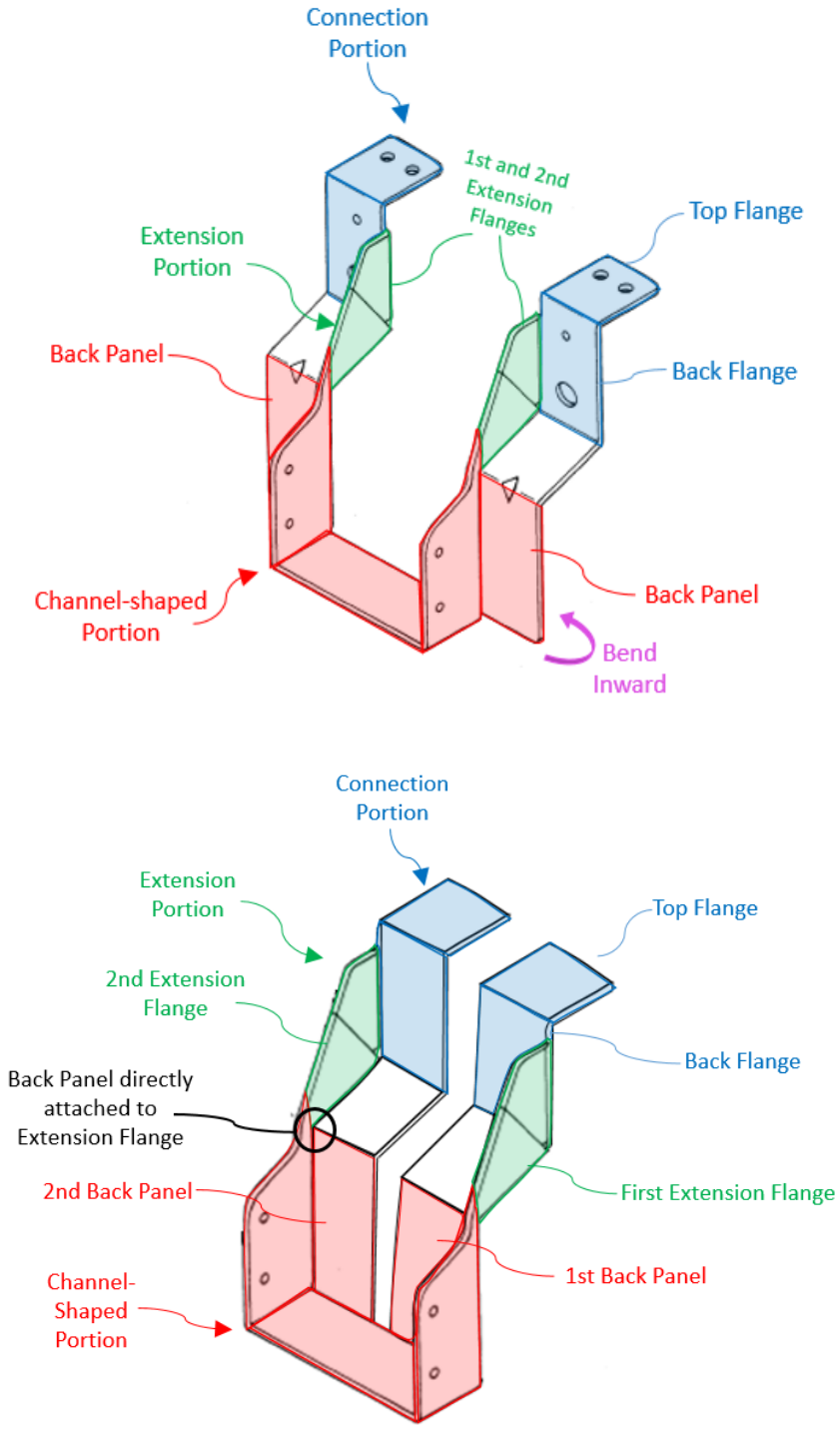


EX1041, Side View (annotated).

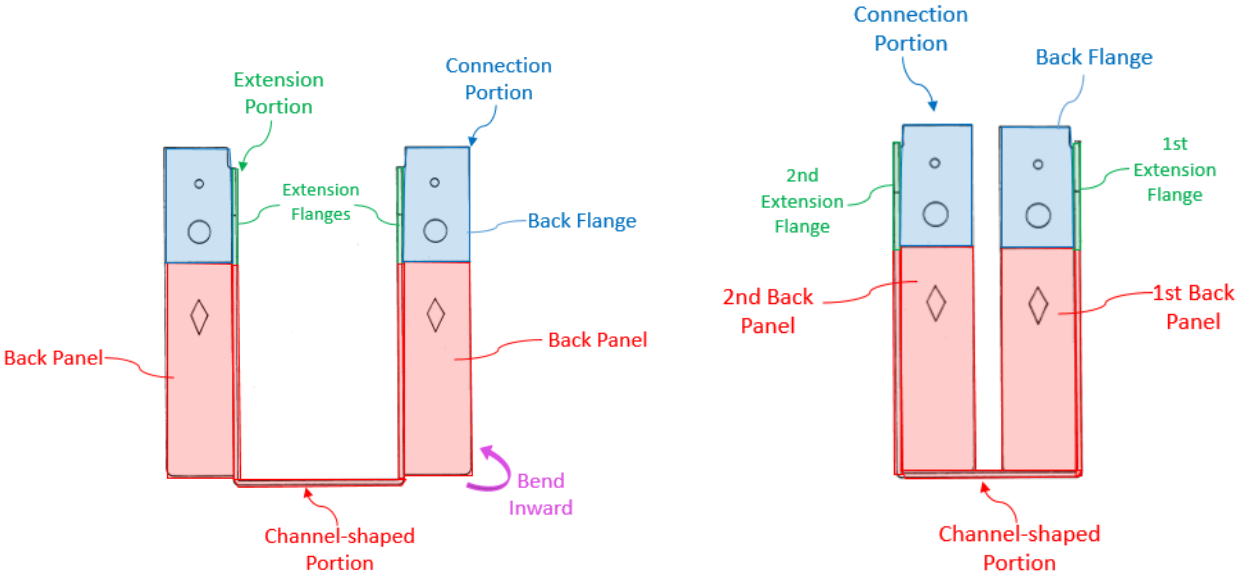
F. Claims 52 and 105

1) First and Second Back Panels Directly Attached to First and Second Extension Flanges

As shown by the annotations below, Yamaguchi discloses that each back panel (red, parallel with back flange) is directly attached (no intervening components) to a respective extension flange (vertical elements in green), such as at the lower portion of the extension flange at the fold line where the back panel is bent inwards as taught by Bundy (circled below), from which the bottom of the extension flange extends to the connection portion. EX1003, ¶148.



EX1041, Perspective View (annotated, rendering).



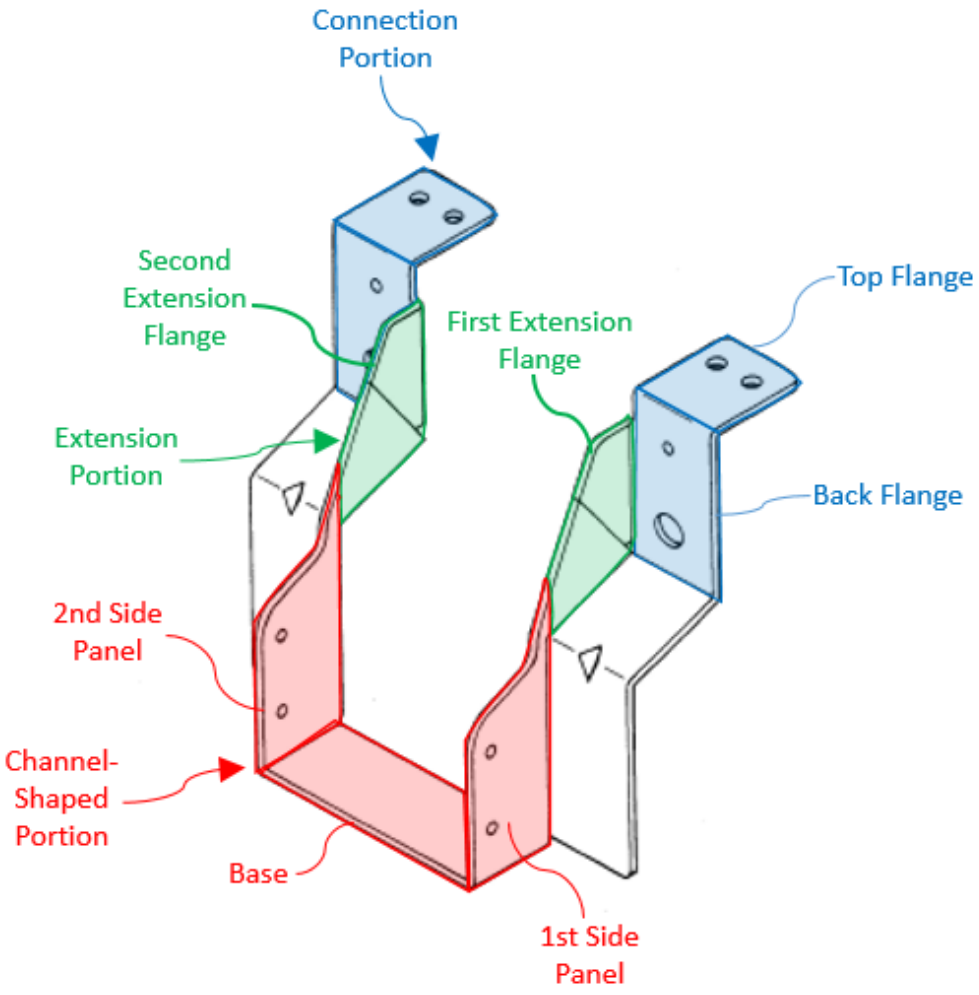
EX1041, Front View (annotated, rendering).

2) One-piece of Sheet Metal

As discussed for claims 45 and 98, employing the teachings of Adams's manufacturing process with Yamaguchi-Bundy would have rendered obvious Yamaguchi-Bundy's channel-shaped portion, connection portion, and extension portion being formed as one-piece of sheet metal. EX1003, ¶149; EX1040, 3:55–57, 4:2–36, 6:3–22.

3) Second Side Panel

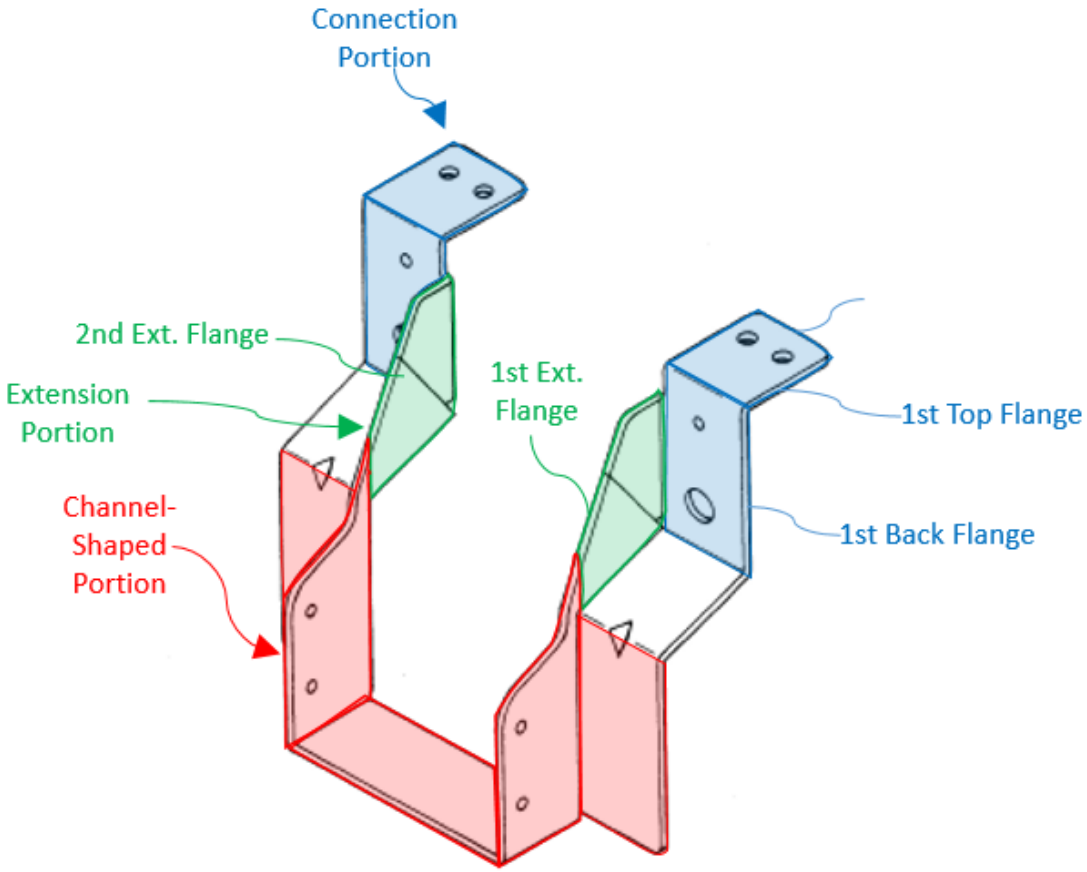
As discussed for claims 42 and 95, Yamaguchi discloses the channel-shaped portion including first and second side panels (annotated below) extending upward (i.e., vertically) from the base (annotated below), wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other. EX1041, 2–5; EX1003, ¶150.



EX1041, Perspective View (annotated).

4) First Back and Top Flanges

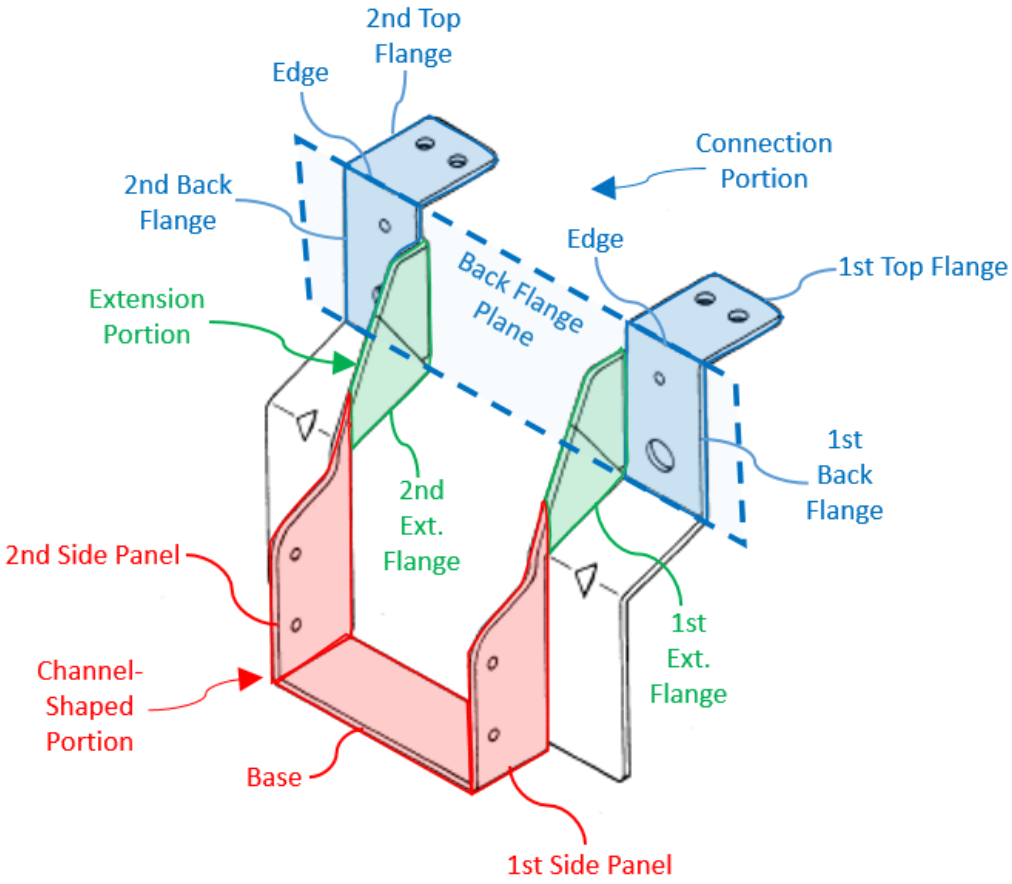
For the reasons discussed for claims 39 and 92, Yamaguchi discloses that the back flange is a first back flange and the top flange is a first top flange. EX1041, 2–5; EX1003, ¶151.



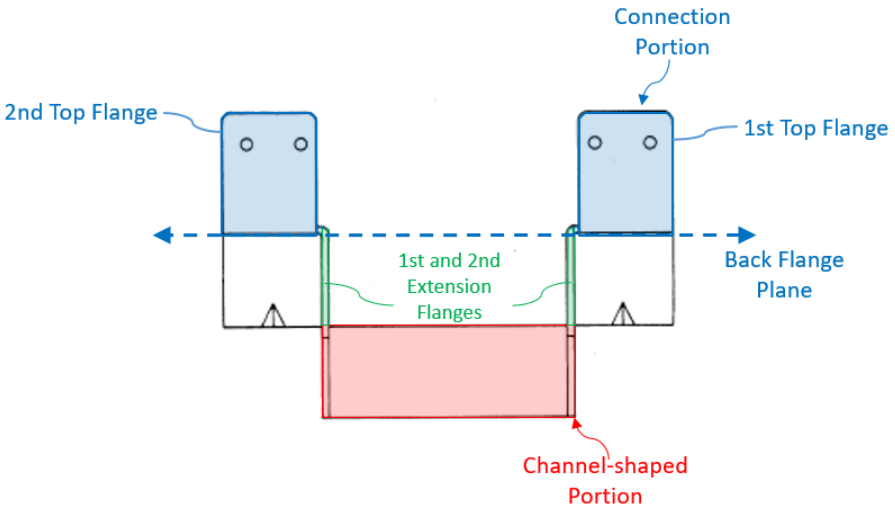
EX1041, Perspective View (annotated).

5) Second Back Flange and Second Top Flange

For the reasons discussed for claims 39 and 92, when mounted on a frame wall as taught by Bundy, Yamaguchi-Bundy discloses that 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 and 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. EX1041, 2–5; EX1003, ¶152.



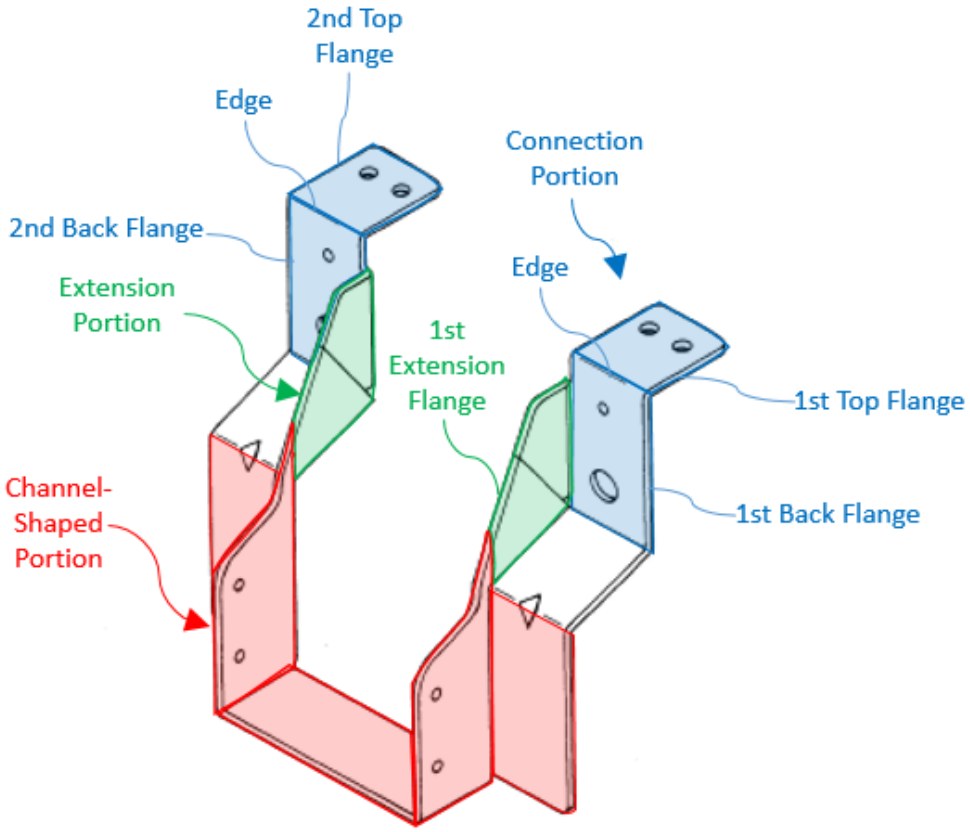
EX1041, Perspective View (annotated).



EX1041, Plan View (annotated).

6) Extension Flanges Extending From Back Flanges to Channel-Shaped Portion

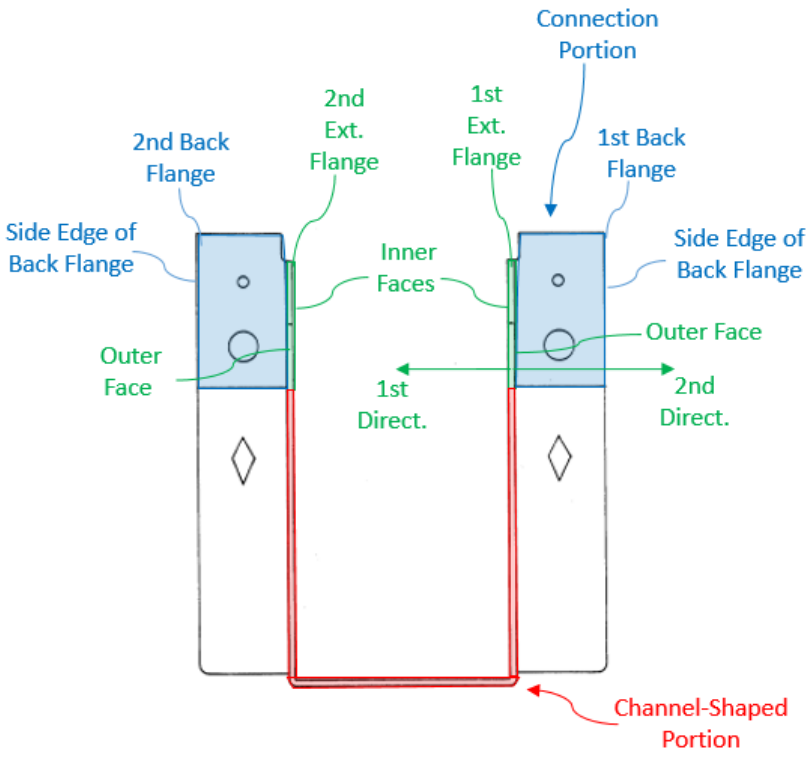
As discussed for claims 1.3.A, 39, 41, and 94, Yamaguchi discloses that the first extension flange extends from the first back flange to the channel-shaped portion and that the second extension flange extends from the second back flange to the channel-shaped portion. EX1041, 2–5; EX1003, ¶153.



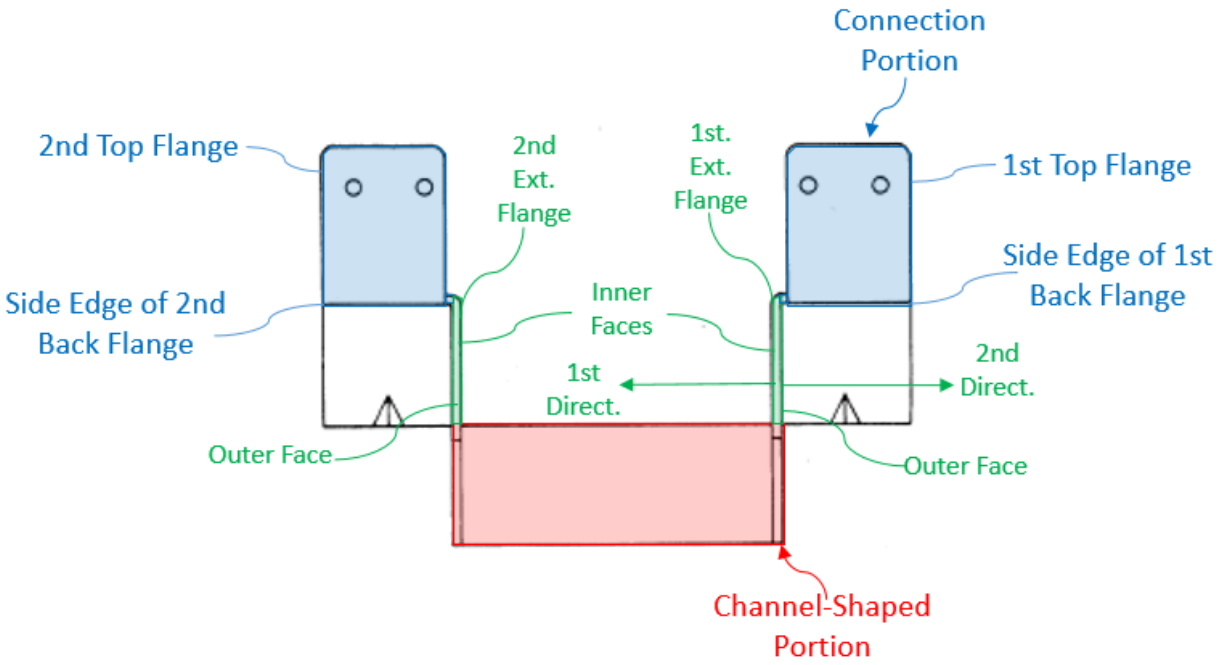
EX1041, Perspective View (annotated).

7) Inner and Outer Faces of Extension Flanges and Side Edge of Back Flanges

Yamaguchi discloses that the first and second extension flanges each have a thickness and thus includes an inner face and an outer face (annotated below). EX1041, 2–5. Yamaguchi discloses the inner faces of the first and second extension flanges face one another—the inner face of the first extension flange (right) facing in a first direction (annotated below) toward the inner face of the second extension flange (left), and the outer face of the first extension flange facing in a second direction (annotated below) that is opposite the first direction. EX1041, 2–5; EX1003, ¶154.



EX1041, Front View (annotated).



EX1041, Plan View (annotated).

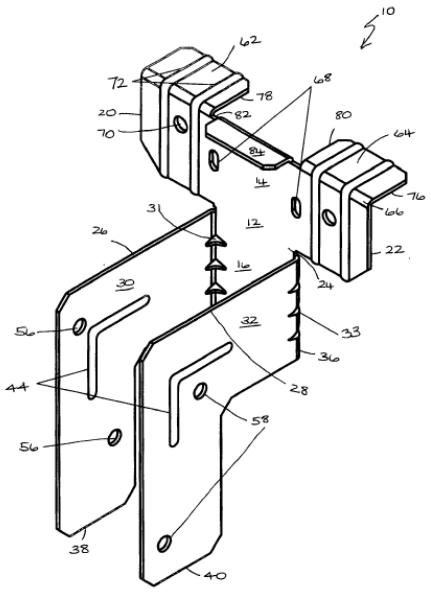
Yamaguchi further discloses the first back flange having a side edge (annotated above) disposed outward, in the second direction, of the outer face of the first extension flange, as shown above. EX1041, 2–5; EX1003, ¶155. Yamaguchi further discloses the second back flange having a side edge (annotated above) disposed outward, in the first direction, of the outer face of the second extension flange. EX1041, 2–5; EX1003, ¶¶155-156.

VII. Claims 1, 22–27, 39–45, 50–53, 74–79, 92–98, and 103–105 Would Have Been Obvious over Cullen in view of Bundy.

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, ¶¶157-158. 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. *Id*.

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

Cullen and Bundy are both directed to joist hangers. EX1003, ¶¶32–42, 159. 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). EX1003, ¶159. 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. EX1007, 5:16-18. Two 5/8" thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶160.



EX1039, FIG. 1;

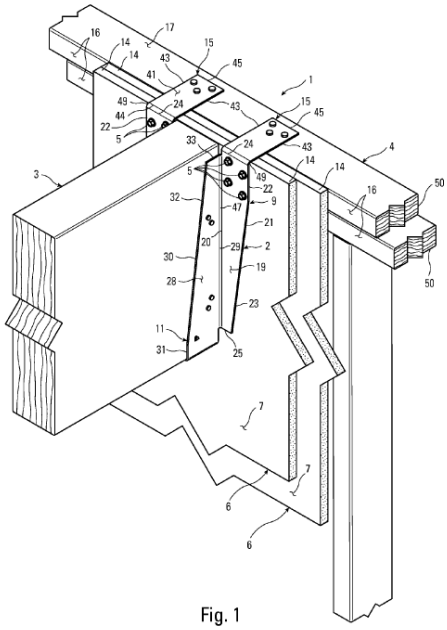


Fig. 1

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, ¶161. 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, ¶¶161-162. 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, ¶¶161-162. 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, ¶162; 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, ¶162.

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, where the joist would not extend past 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, ¶163. 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, ¶163; EX1007, 4:47-53; 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, ¶164; EX1039, 12:20–13:5. Doing so would have been well within the level of ordinary skill in the art. EX1003, ¶¶164-165.

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,"

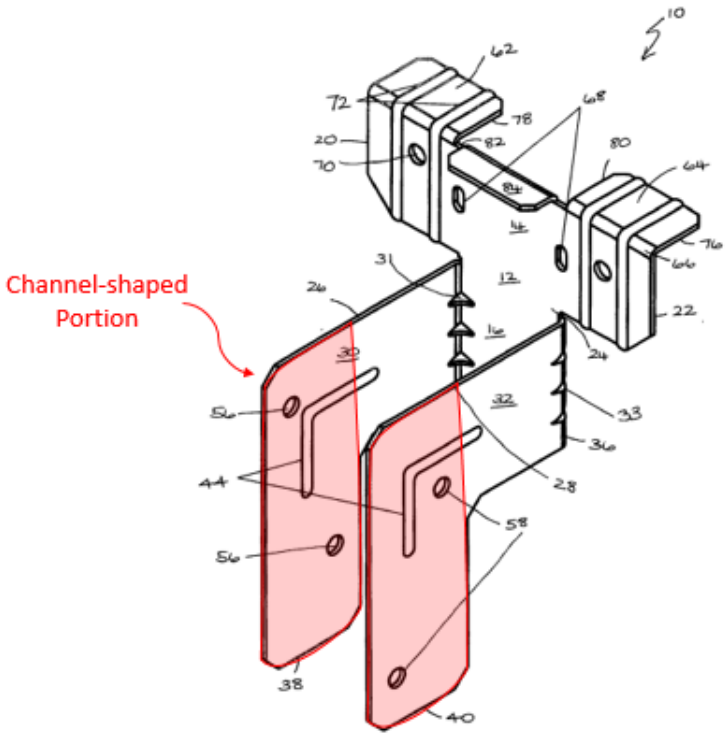
As discussed above as to Yamaguchi, the preamble of claim 1 is not limiting because claim 1's body recites a structurally complete invention and uses the preamble only to state a purpose or intended use.

To the extent that the preamble is limiting, the Cullen-Bundy combination ("Cullen-Bundy") renders obvious such a hanger. EX1003, ¶¶166-167. 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. 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, ¶167; 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 directly thereto. EX1003, ¶167. 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. EX1003, ¶167. 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* ¶168; s*ee, 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, ¶¶169-170.

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

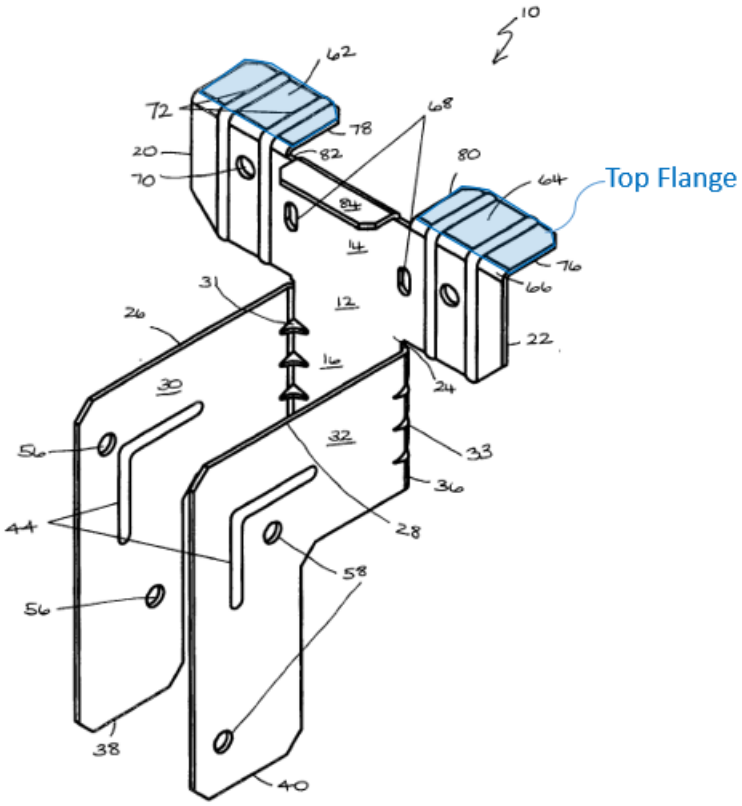
Cullen discloses a channel shaped portion (which includes legs 38/40 and an optional seat) configured to receive the structural component (joist). EX1003, ¶¶171-172; EX1039, 10:29–11:1, 17:20–25. Cullen further discloses that "[t]he joist hanger may include a seat portion." EX1039, 5:25, 7:20–22.



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, 3:2-11, 11:24–29; EX1003, ¶¶173-174.

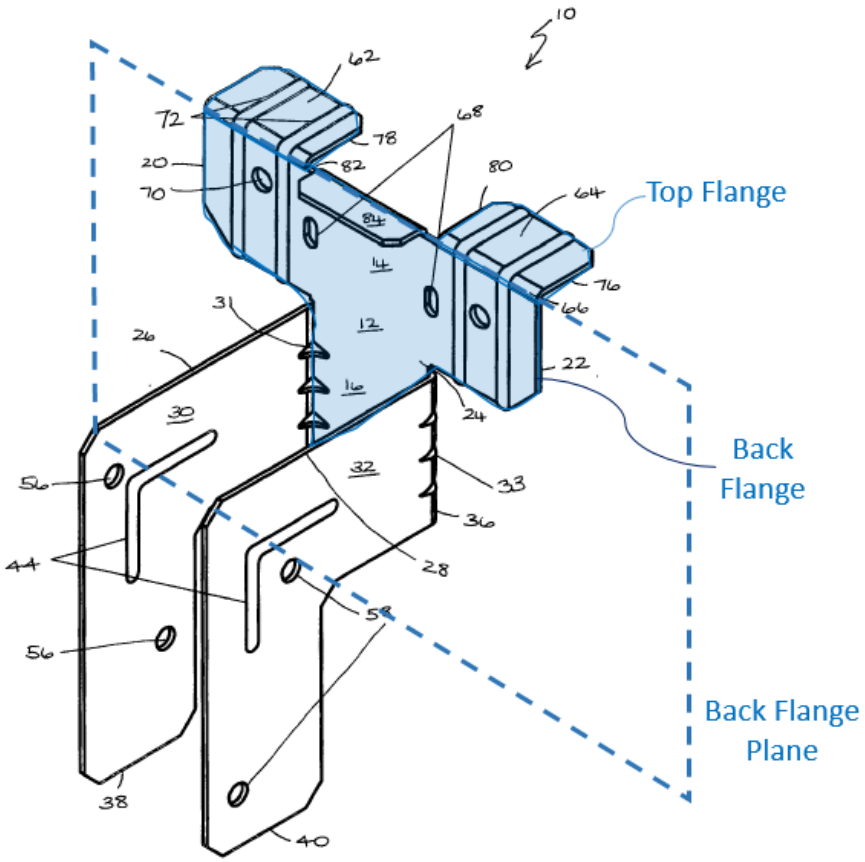


EX1039, FIG. 1 (annotated).

[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,"

Cullen discloses a back flange (back plate 12), the back flange extending from an edge of the top flange (bearing plates 62/64) and being arranged to engage

a vertical face of the top plate of the frame wall as suggested by Bundy, the back flange having a front surface lying in a back flange plane. EX1039, 10:16–22.; EX1003, ¶¶175-176.

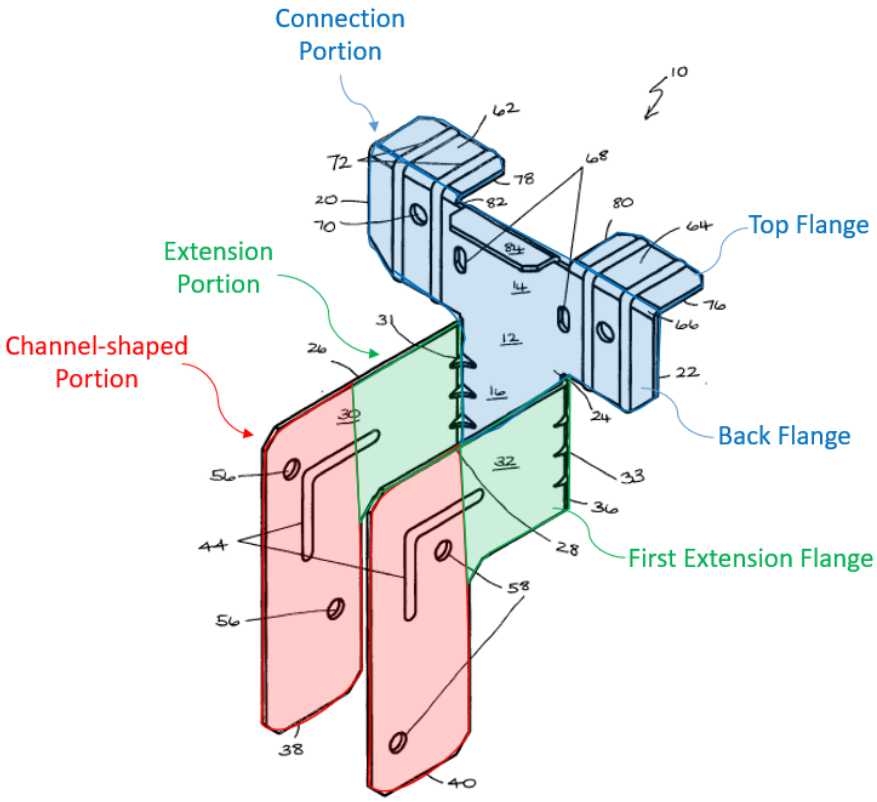


EX1039, FIG. 1 (annotated).

[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;"

Cullen discloses an extension portion including a first extension flange (sidewall 32) extending from the back flange (back plate 12) to the channel-shaped

portion (which includes legs 38/40 and an optional seat). EX1039, 10:25–11:1, EX1003, ¶¶177-178.

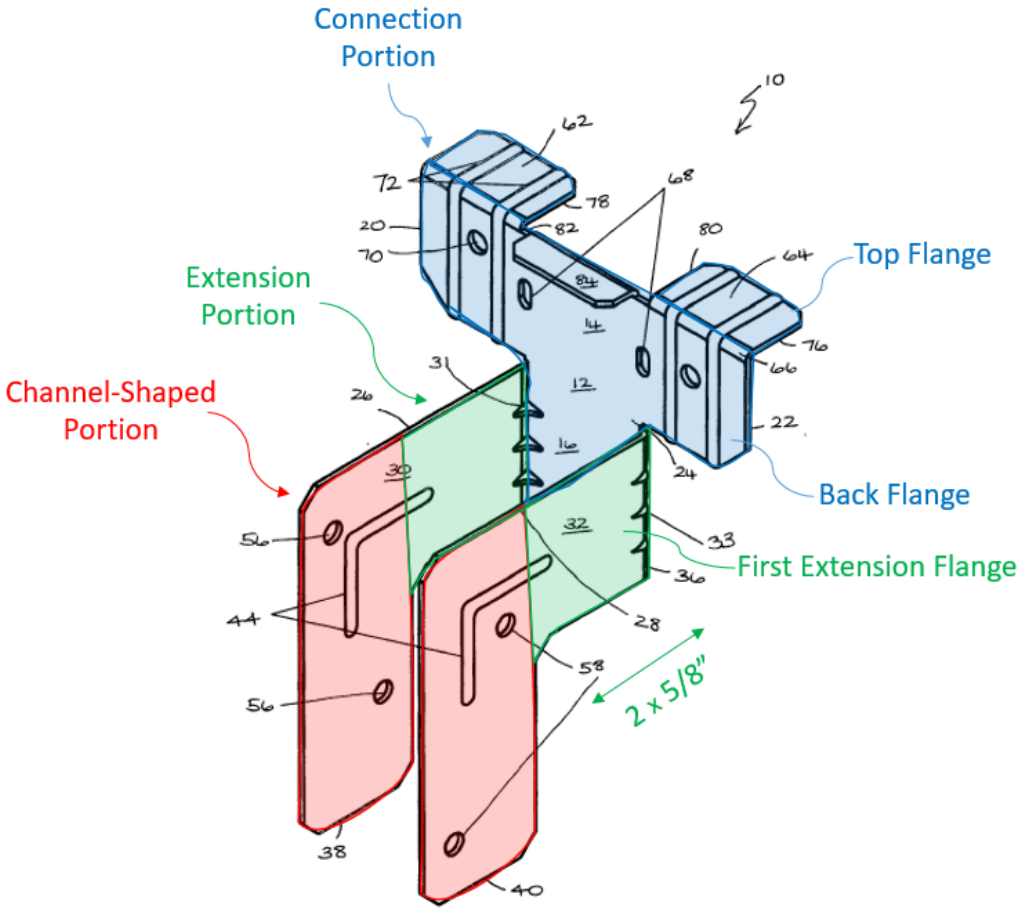


EX1039, FIG. 1 (annotated).

[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, ¶179. 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

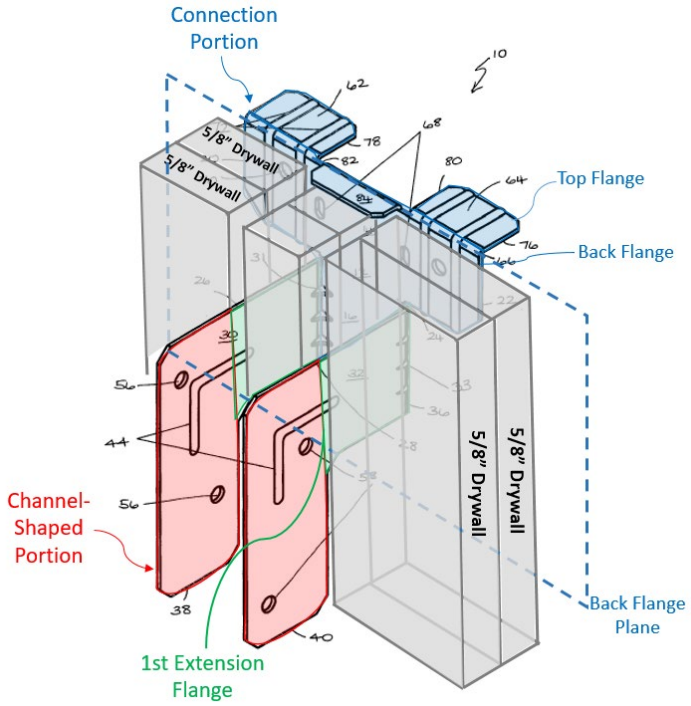
obvious to size the length of Cullen's sidewalls 30/32 to define a space for receiving two layers of 5/8-inch-thick drywall therein based on Bundy. *See*, §VII.A; EX1003, ¶179. Bundy teaches installing two layers of 5/8" drywall between a hanger's channel shaped portion (Bundy's side members 11) and wall frame. EX1007, 5:18-20; EX1003, ¶179.



EX1039, FIG. 1 (annotated).

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, ¶180; EX1007, 4:46-53; 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, ¶¶180-181; 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; EX1003, ¶180.



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, ¶¶182-183; EX1039, 5:26-28, 8:12–19, 10:12–14.

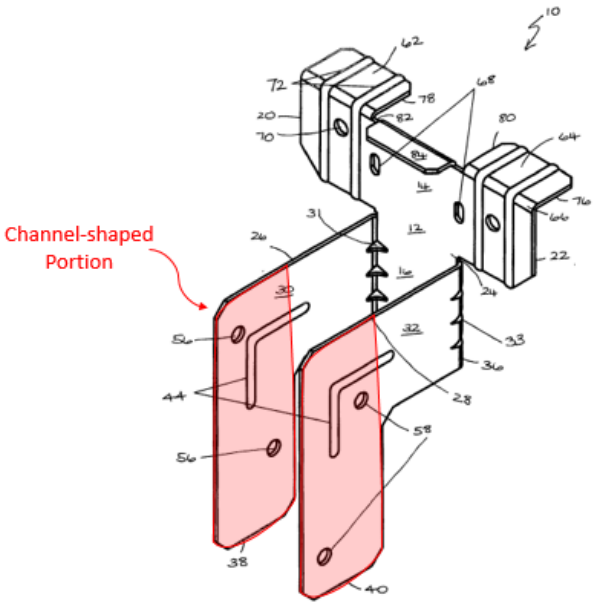
C. Independent Claim 53

[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 for claim 1, element [1.P], Cullen–Bundy renders obvious this limitation. EX1003, ¶184.

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

As discussed for claim 1, element [1.1.A], Cullen discloses this limitation. EX1003, ¶185; EX1039, 10:29–11:1, 17:20–25, FIG. 1.

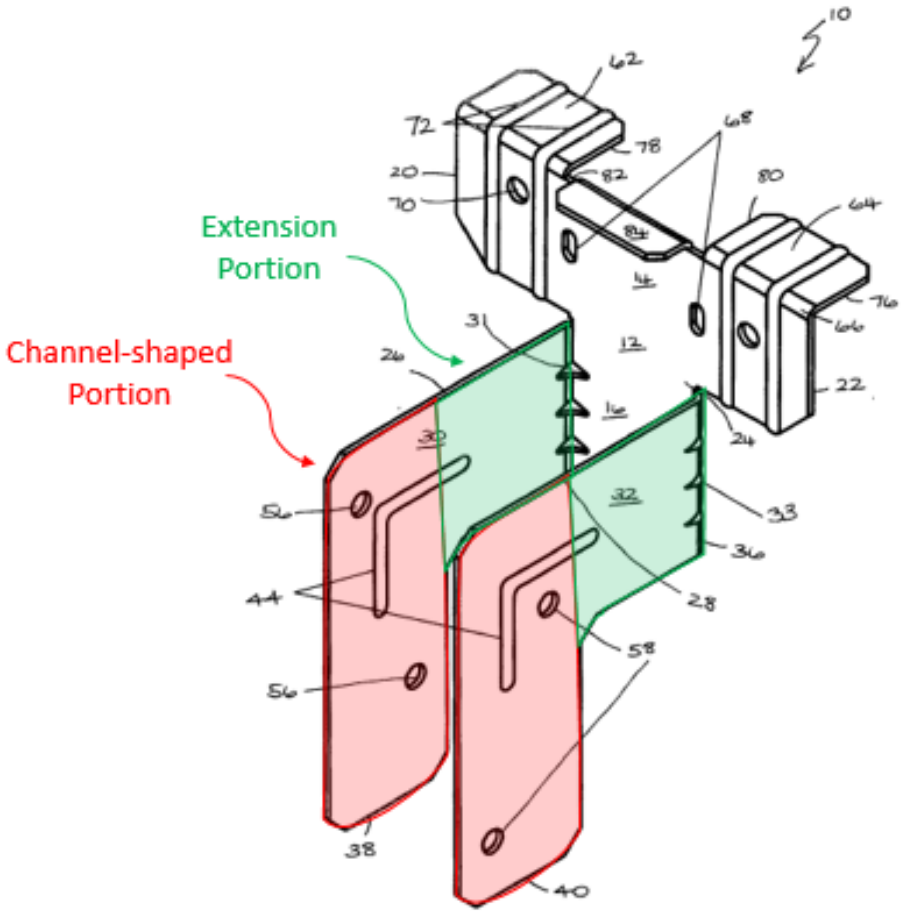


EX1039, FIG. 1 (annotated).

[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, ¶186; 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, ¶187; 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, ¶187. Thus, as modified by Bundy, Cullen's sidewalls 30/32 are configured to extend through two layers of 5/8-inch-thick drywall. EX1003, ¶¶187-188.



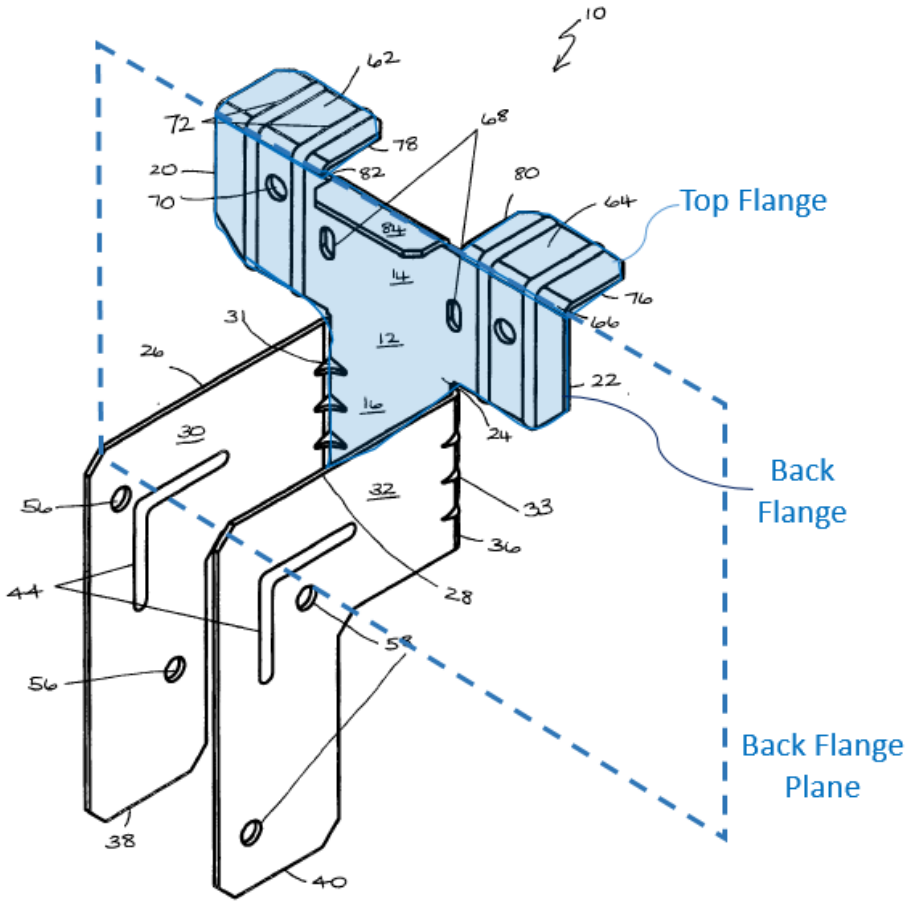
EX1039, FIG. 1 (annotated).

[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 for claim 1, element [1.2.A], Cullen renders obvious this limitation. EX1003, ¶189; EX1039, 3:2–11, 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,"

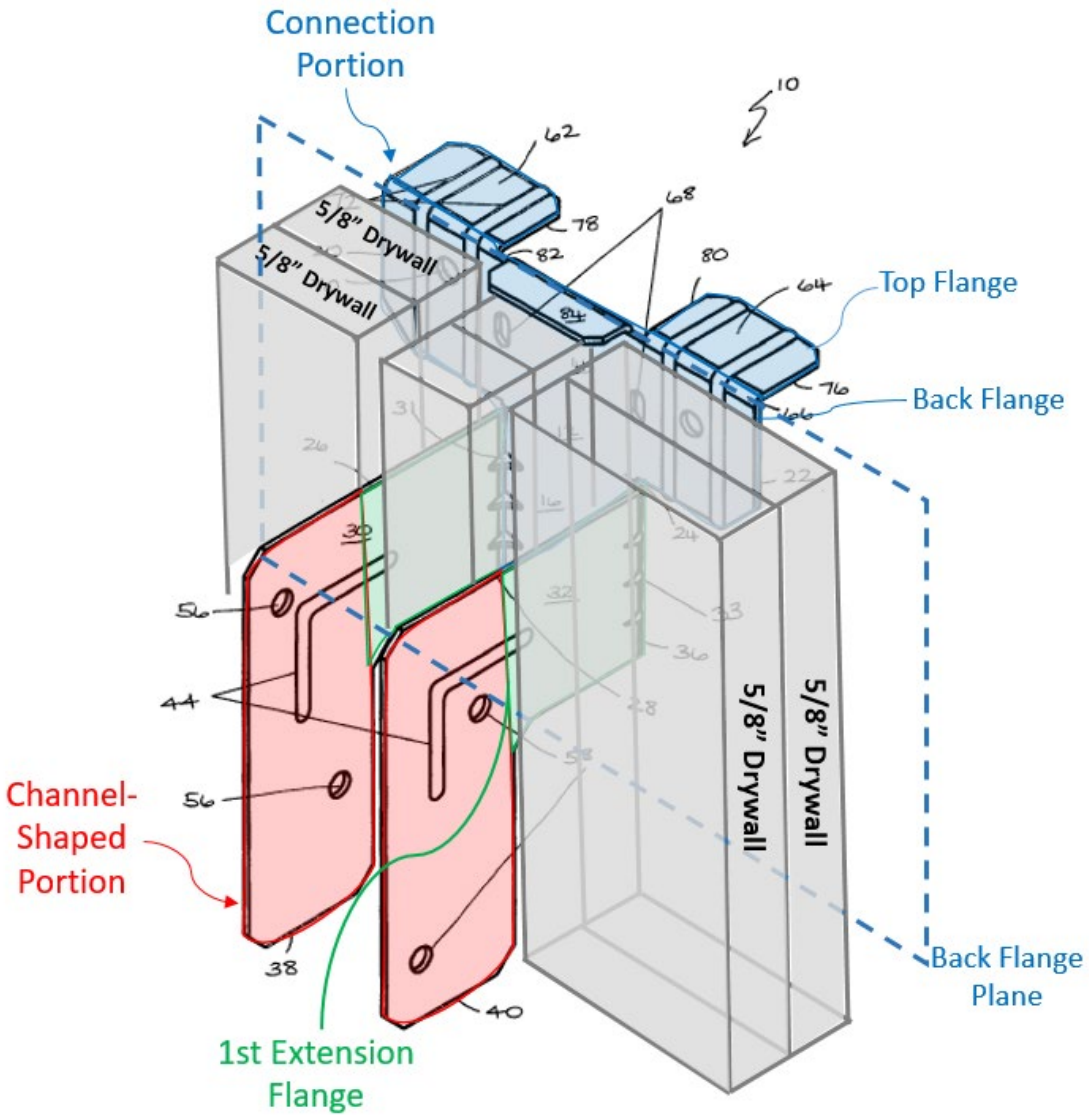
As discussed for claim 1, element [1.2.B], Cullen-Bundy renders obvious this limitation. EX1003, ¶190; EX1039, 10:16–22,



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 for claim 1, element [1.3.B], Cullen–Bundy renders obvious this limitation. EX1003, ¶191; EX1007, 5:18–20; EX1039, FIG. 1.



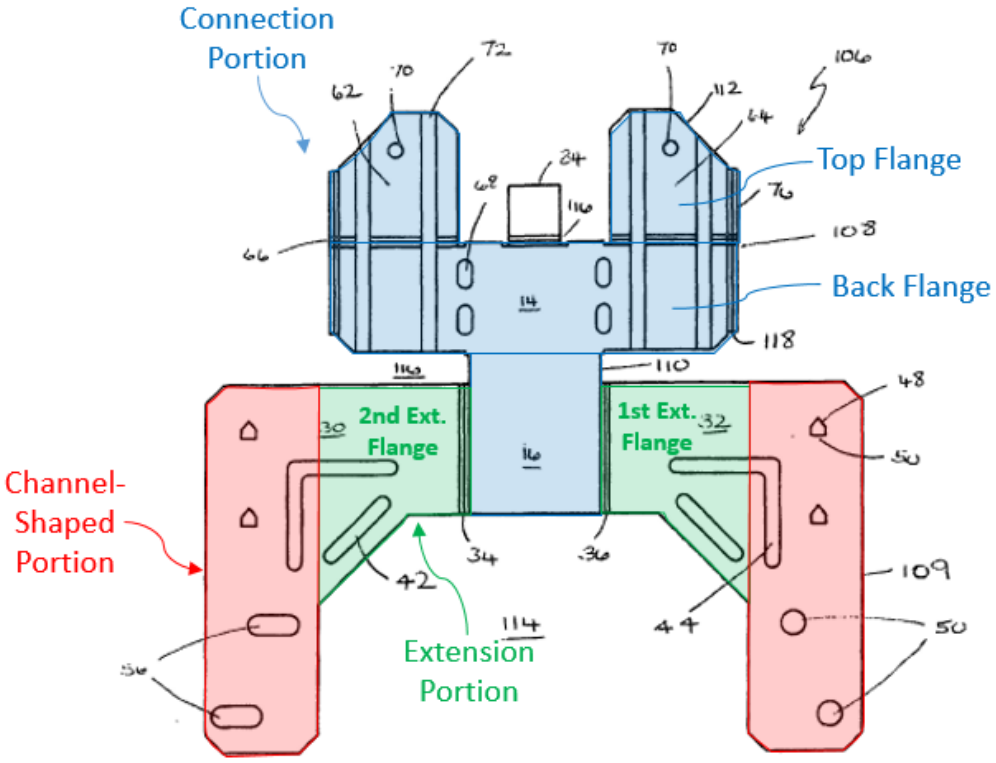
EX1039, FIG. 1 (annotated).

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

As discussed for claim 1, element [1.4], Cullen discloses this limitation. EX1003, ¶192; EX1039, 8:12–19, 10:12–14.

D. Claims 22-24, 26-27, 74-76 and 78-79

Cullen discloses that its extension portion (sidewalls 30/32), including its first extension flange (sidewall 32), its channel-shaped portion (legs 38/40), and its connection portion (back plate 12, bearing plates 62/64) are all formed as one-piece of sheet metal (blank 106), thus disclosing all combinations of two or more of those elements, as recited in claims 22-24, 26-27, 74-76, and 78-79. EX1039, 10:12–14 ("Bracket 10 is formed from a single sheet of metal."); 18:8–19:7; EX1003, ¶¶193-195.

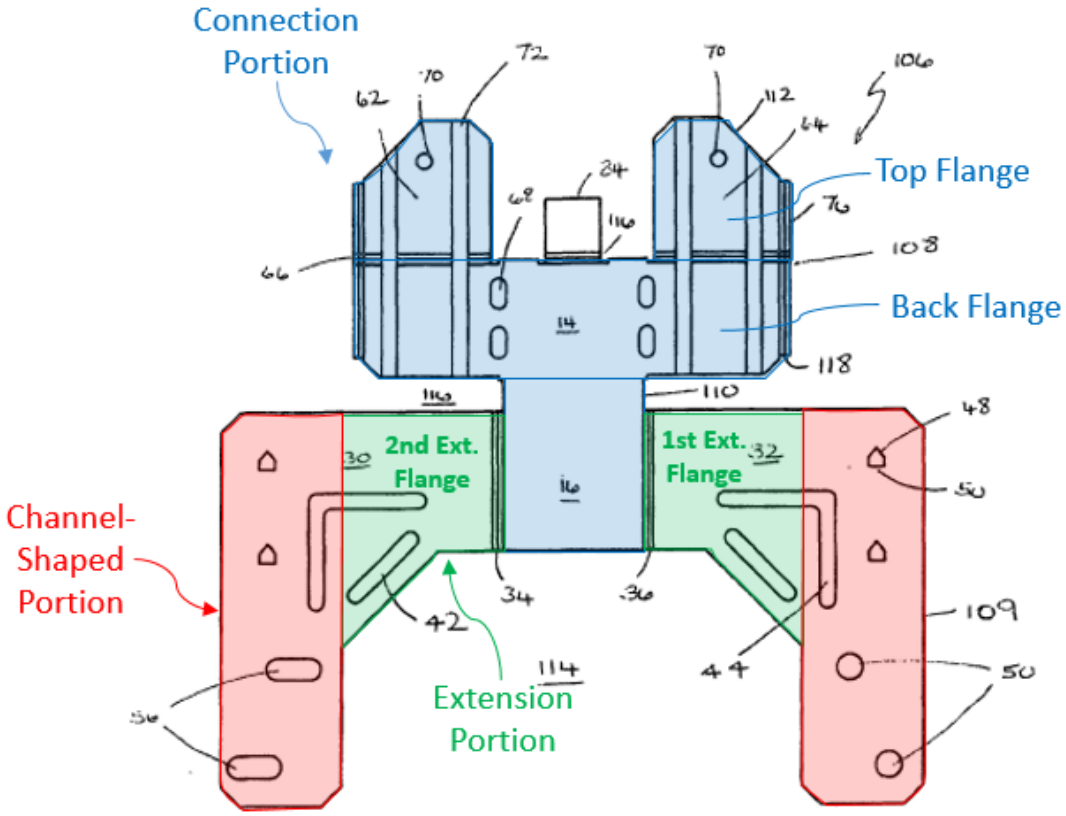


EX1039, FIG. 4 (annotated).[5]

E. Claims 25 and 77

Cullen discloses that the channel-shaped portion is made of sheet metal (blank 106) and that the extension portion, including its first extension flange, is an extension of the sheet metal (blank 106) forming the channel-shaped portion. EX1039, 10:12–14; 18:8–19:7; EX1003, ¶¶196-197.

[5] While the blank 106 shown in Figure 4 corresponds to hanger 100 shown in Figure 2, a POSITA would have understood that blank 106 is applicable to forming bracket 10 shown in Figure 1. EX1003, ¶193; EX1039, 10:12–14, 18:8–19:7.

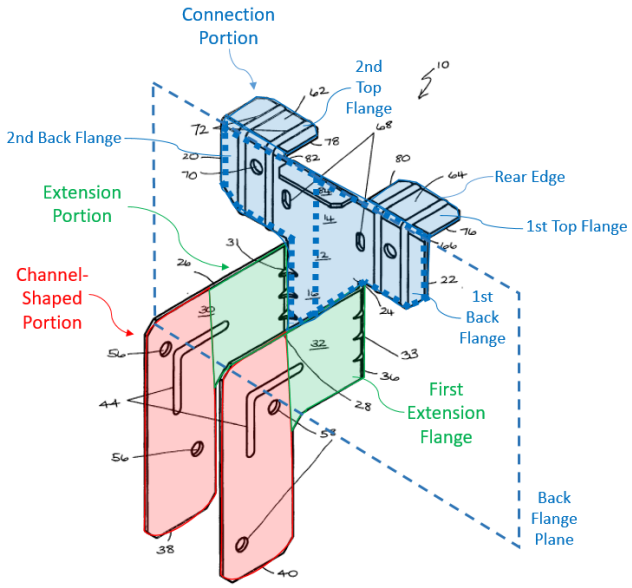


EX1039, FIG. 4 (annotated).

F. Claims 39 and 92

A POSITA would have understood that Cullen's back flange (back plate 12) is a combination of two halves – a first half (the right-half of back plate 12 associated with sidewall 32) constituting a first back flange, and a second half (the left-half of back plate 12 associated with sidewall 30) constituting a second back flange, such that the two halves meet and join in the middle of Cullen's back flange. EX1003, ¶198. Cullen thus discloses that the back flange is a first back flange and the top flange is a first top flange (bearing plate 64 located on right-half of back plate 12). EX1039, 10:16–22, 11:24–29. When mounted on a frame wall as

taught by Bundy, Cullen-Bundy discloses that the connection portion includes a second top flange (bearing plate 62 located on left-half of back plate 12) arranged to engage the top surface of the top plate of the frame wall and a second back flange (left-half of back plate 12 associated with sidewall 30) extending from an edge (fold line 66) of the second top flange (bearing plate 62) and arranged to engage the vertical face of the top plate of the frame wall. Being constructed from flat sheet metal, Cullen's second back flange has a front surface lying in the back flange plane. EX1003, ¶¶198-199.

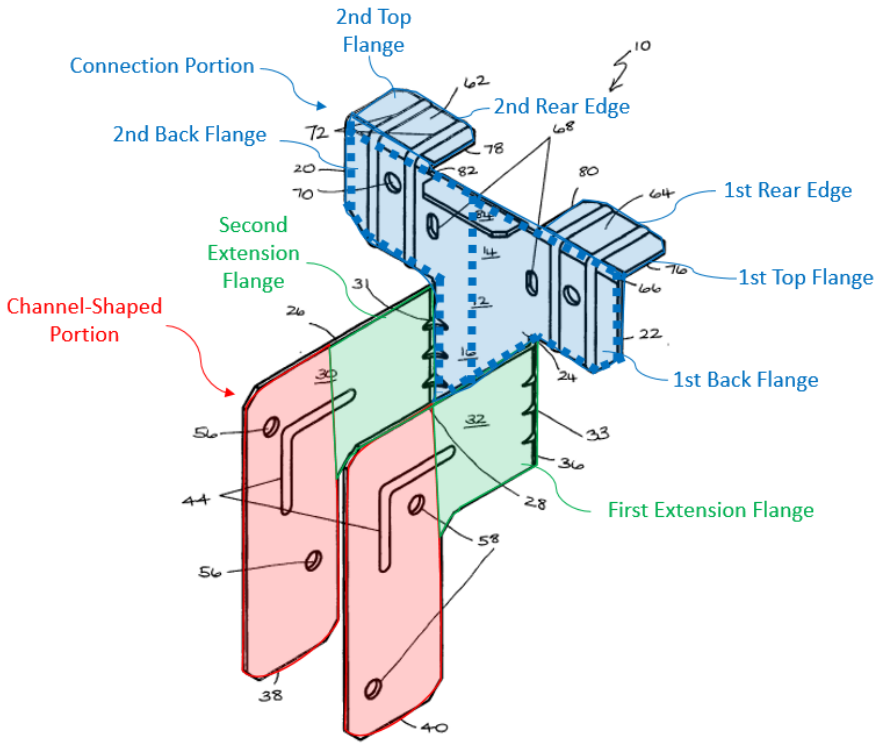


EX1039, FIG. 1 (annotated).

G. Claims 40 and 93

Cullen discloses that the first top flange includes a first rear edge (annotated below) located rearwardly of the edge of the first top flange from which the first

back flange extends, and that the second top flange includes a second rear edge (annotated below) located rearwardly of the edge of the second top flange from which the second back flange extends. EX1039, 10:16–22, 11:24–29, FIG. 1; EX1003, ¶200. Cullen discloses the first rear edge (annotated below) being located rearwardly of the first back flange and the second rear edge (annotated below) being located rearwardly of the second back flange. EX1039, 10:16–22, 11:24–29, FIG. 1; EX1003, ¶¶200-201.

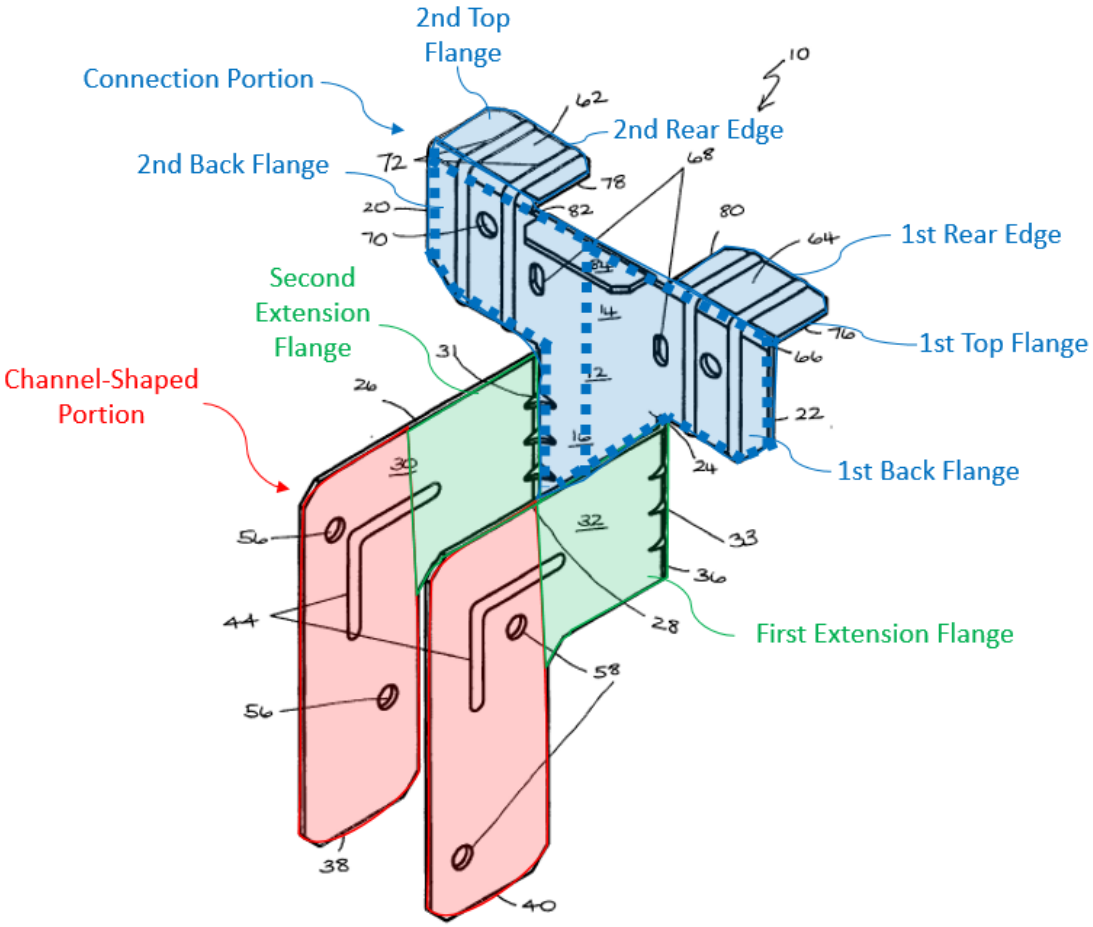


EX1039, FIG. 1 (annotated).

H. Claims 41 and 94

For the reasons discussed for [1.3.A], and given that Cullen's sidewall 30 and leg 38 are symmetrical to sidewall 32 and leg 40, Cullen discloses that the

extension portion includes a first extension flange (sidewall 32) extending from the channel-shaped portion to the first back flange (and vice-versa) and a second extension flange (sidewall 30) extending from the second back flange to the channel-shaped portion (and vice-versa). EX1039, 10:25–11:1, FIG. 1; EX1003, ¶¶202-203.

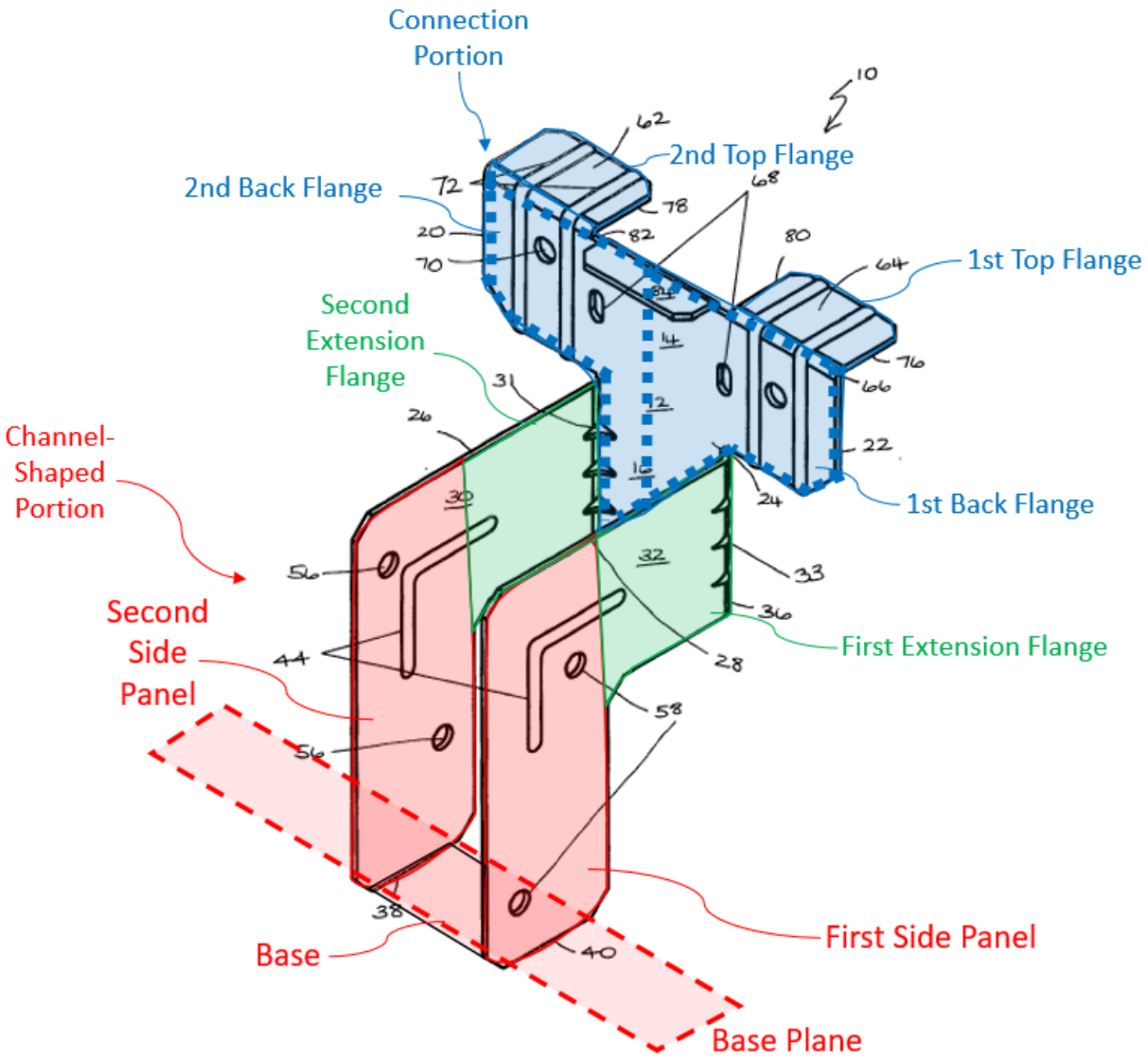


EX1039, FIG. 1 (annotated).

I. Claims 42 and 95

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." EX1003, ¶204. It would have been obvious to modify Cullen's hanger 10 shown in Figures 1–4 to include a base (the "seat") receiving the joist's end portion, and extend legs 38/40 upward from the base. EX1003, ¶204. "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, ¶204. A POSITA would have further understood that such a seat may instead be formed by bending a lower portion of one or both legs 38/40 inward to meet the other. *Id.*

This renders obvious the channel-shaped portion including a base configured to receive and support the structural component's end portion, and first and second side panels (leg 40/38) extending upward from the base. EX1003, ¶205.

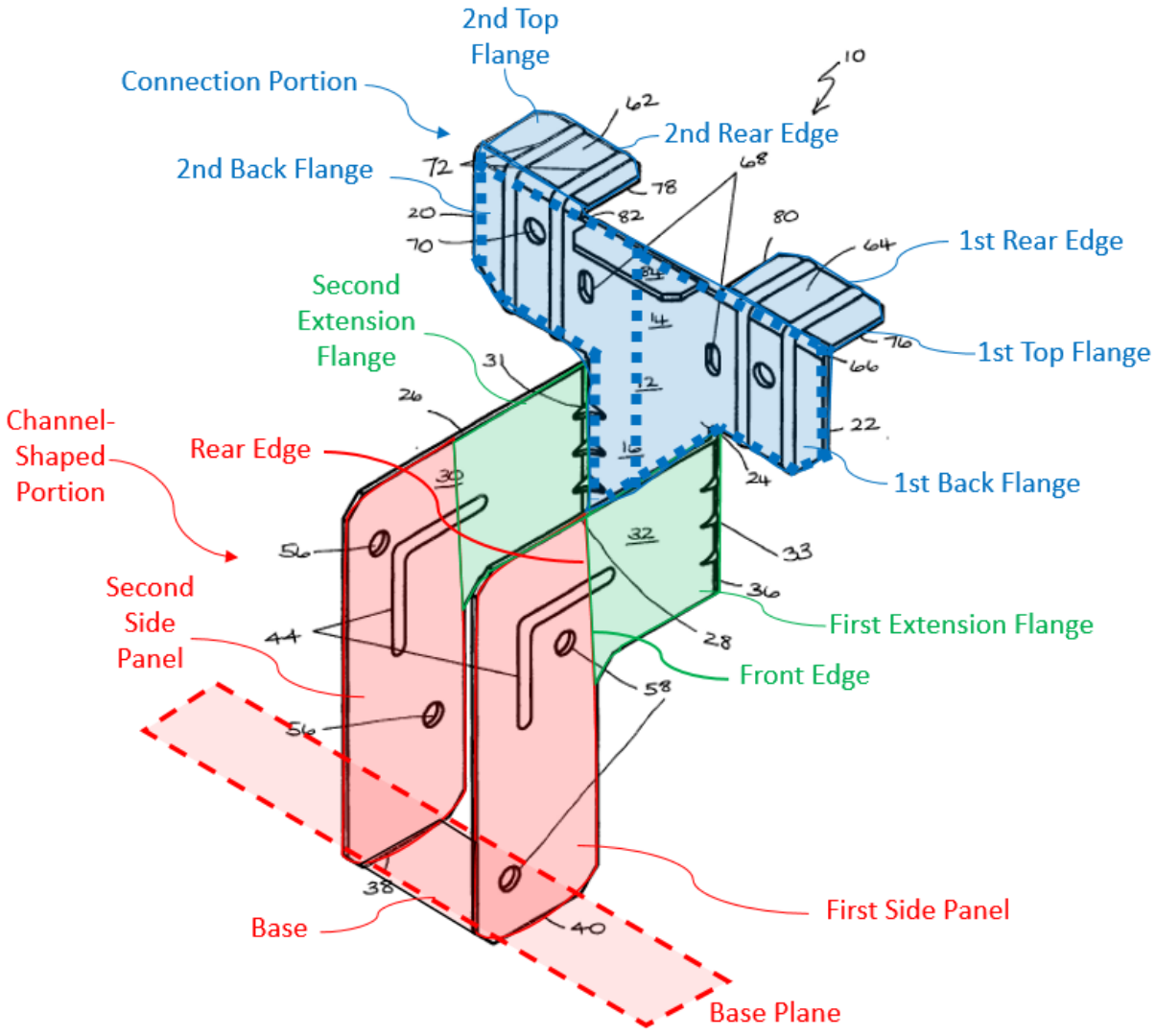


EX1039, FIG. 1 (annotated).

Cullen's sidewall 30 and leg 38 are co-planar, as they share the same vertical orientation. Cullen's sidewall 30 and leg 38 are symmetrical to sidewall 32 and leg 40. Cullen thus discloses the first and second extension flanges parallel to each other and the first and second side panels parallel to each other, as shown above. EX1039, FIG. 1; EX1003, ¶206.

J. Claims 43 and 96

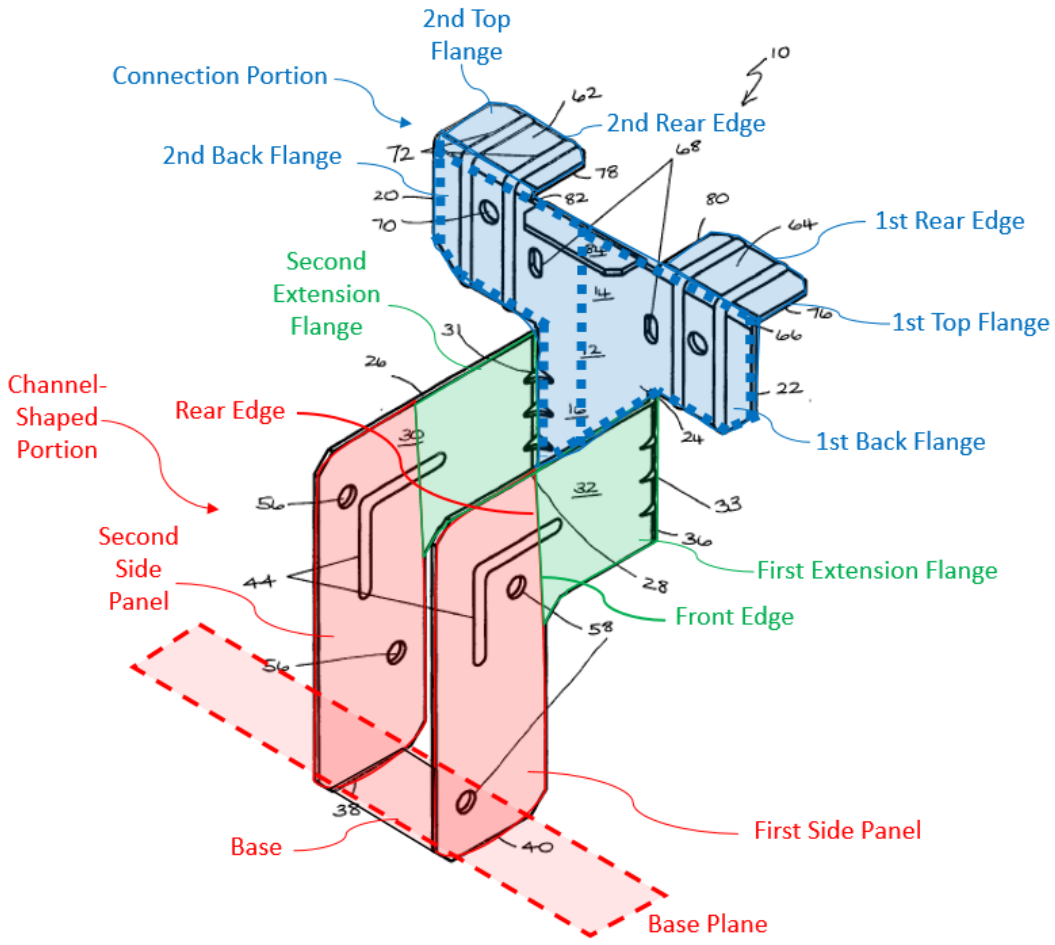
Cullen discloses that a front edge of the first extension flange abuts a rear edge of the first side panel, as they join with no intervening structures. EX1039, FIG. 1; EX1003, ¶¶207-208.



EX10039, FIG. 1 (annotated).

K. Claims 44 and 97

Cullen's first extension flange and first back flange are directly attached to each other by a first bend (fold line 36); the first back flange and the first top flange are directly attached to each other by a second bend (fold line 66). EX1039, 10:22–26, 11:24–27; EX1003, ¶209.



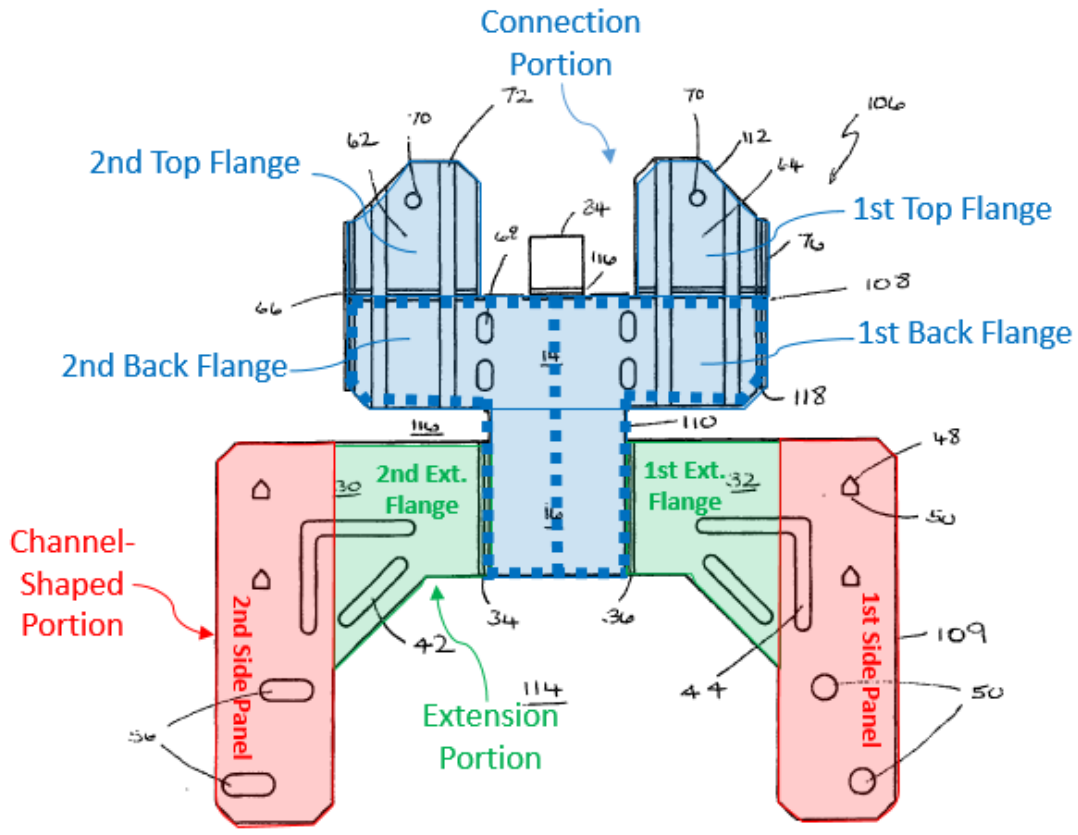
EX1039, FIG. 1 (annotated).

Cullen's second extension flange and second back flange are directly attached to each other by a third bend (fold line 34); the second back flange and the

second top flange are directly attached to each other by a fourth bend (fold line 66 as it extends across the top of back plate 12). EX1039, 10:22–26, 11:24–27; EX1003, ¶210.

L. Claims 45 and 98

As discussed for claims 24, 27, 76, and 79, Cullen discloses the channel-shaped portion, the connection portion, and the extension portion formed as one-piece of sheet metal. EX1039, 10:12–14; 18:8–19:7; EX1003, ¶211.



EX1039, FIG. 4 (annotated).

As discussed for claims 42 and 95, in employing the teachings of Cullen's seat with hanger 10, a POSITA would have found it obvious to include a base with legs 38/40 as a one-piece design by bending a lower portion of one or both legs 38/40 inward from lateral edges of the base. EX1003, ¶212.

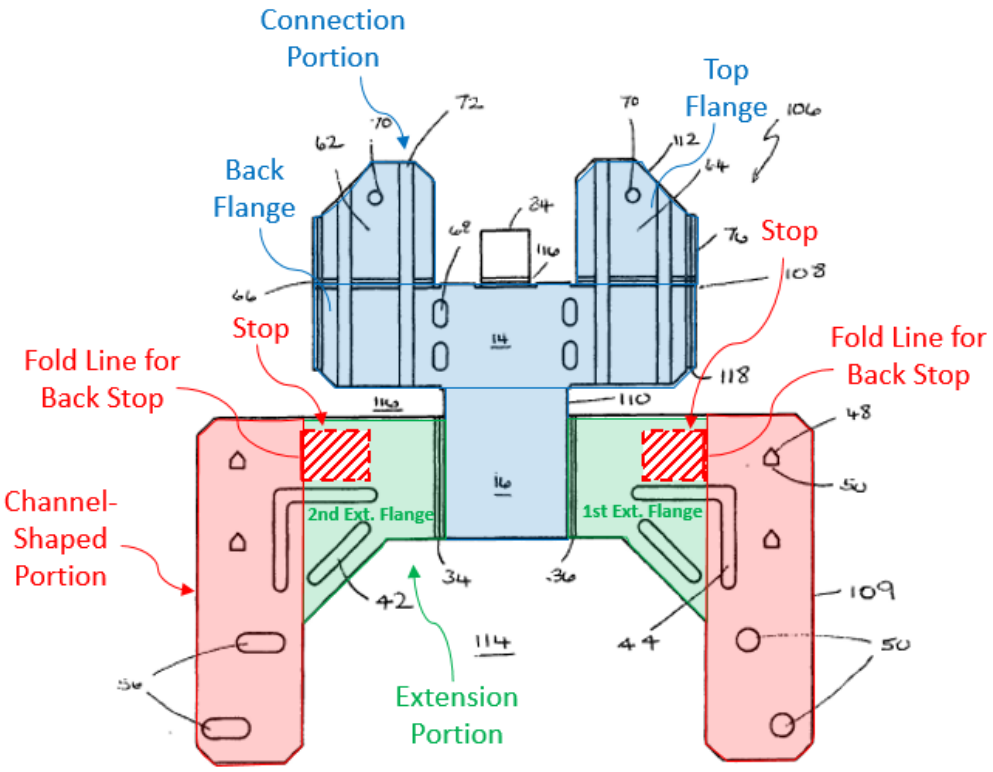
M. Claims 50 and 103

1) Stop Arranged To Engage an End of the Structural Component

Cullen does not explicitly disclose a stop configured 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 therebetween. However, as discussed in §VII.A, Bundy teaches an analogous hanger. Bundy discloses a stop (e.g., back plate members 9) engaging the end of the structural component and spacing it at the requisite distance by bending back plate members 9 inward from its side members 11. EX1007, 4:39-46; EX1003, ¶213. Bending back plate members 9 inward prevents a structural component installed thereon from extending past the back plate members, thereby acting as a stop.

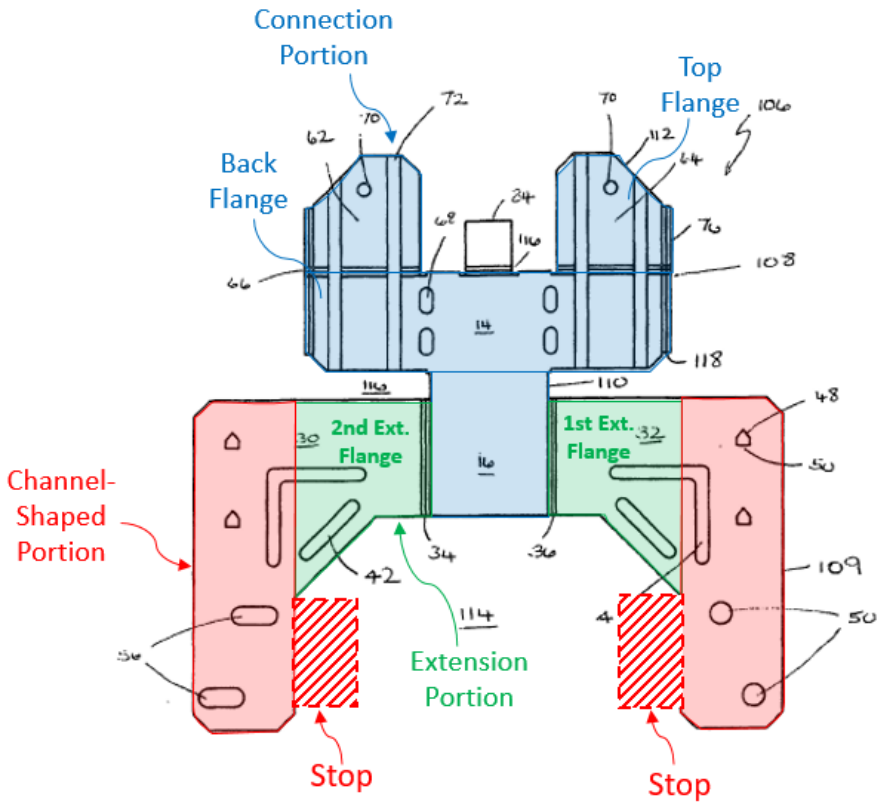
In employing the teachings of Bundy's drywall space with Cullen, a POSITA would have been motivated to provide Cullen's hanger 10 with a stop to engage the joist's end at the noted distance, as taught by Bundy, so it does not

impair drywall installed into the drywall space defined between Cullen-Bundy's back plate and legs (*see* VI.1.3.B and VI.53.4). EX1003, ¶214. Such a modification would have simply been applying a substitution of one known element (the sides of Bundy's channel-shaped portion having stops bent inwards to face each other) for another (the sides of Cullen's channel-shaped portion) to obtain the predictable result of providing a stop at the joist's end. EX1003, ¶214. A POSITA would have had a reasonable expectation of success in providing Cullen's hanger with a stop to engage the joist's end because doing so was well within the level of ordinary skill in the art, as evidenced by Bundy. EX1003, ¶214; EX1007, 4:39-46; EX1008, ¶40. For example, shown below, a POSITA would have understood to cut a section of each sidewall 30/32, and bend the cutout inward at the boundary between the channel-shaped portion and the extension portion to form a stop consisting of back panels. EX1003, ¶214.



EX1039, FIG. 4 (annotated).

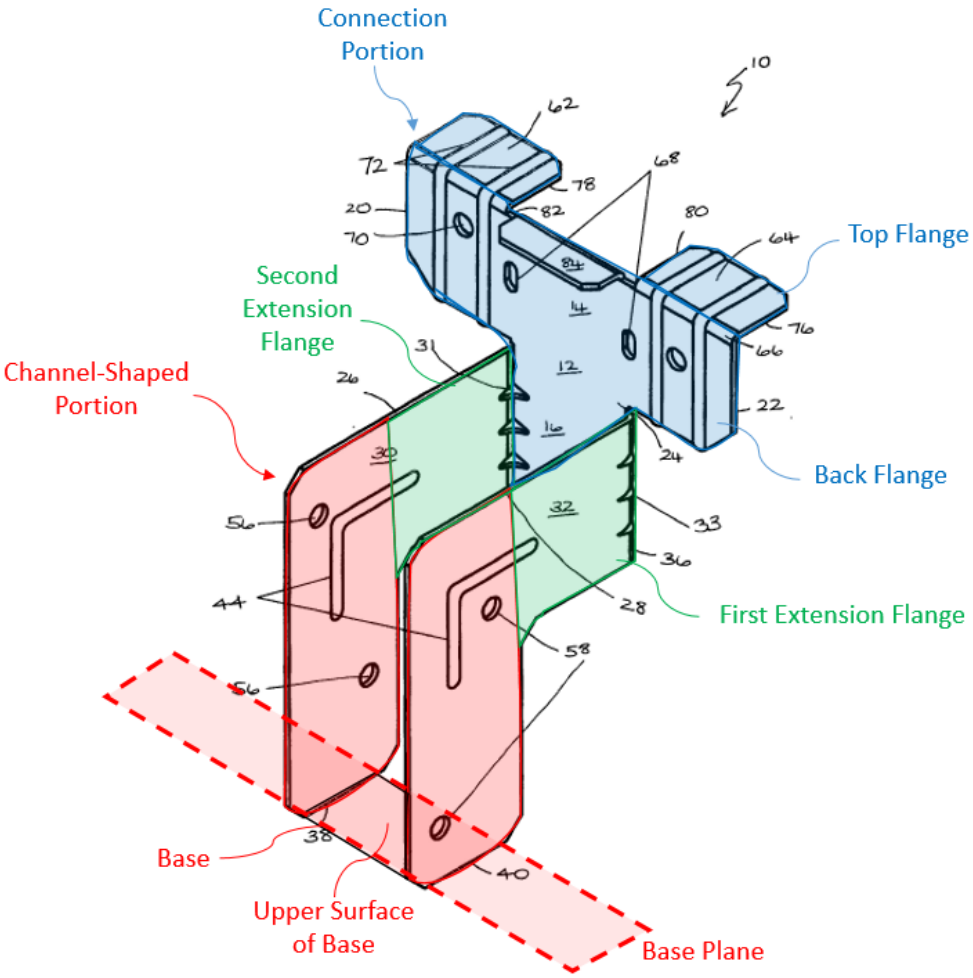
A POSITA would have understood that another option for achieving the stop taught by Bundy would be to configure Cullen's metal blank to include an auxiliary section extending from each leg 38/40 such that the auxiliary section is bent perpendicular to legs 38/40 to form a stop consisting of back panels. EX1003, ¶215.



EX1039, FIG. 4 (annotated).

2) Base to receive End Portion of Structural Component

As discussed above for claims 42 and 95, Cullen renders obvious the channel-shaped portion including a base configured to receive and support a structural component's end portion. The base is made out of sheet metal (EX1039, 5:25-29), and thus has an upper surface defining (thus lying in) a horizontal base plane. EX1039, FIG. 1, 5:25-29; 13:16-26; 19:26-30; EX1003, ¶216. The upper surface is arranged to engage the structural component by receiving the end portion thereof. *Id.*

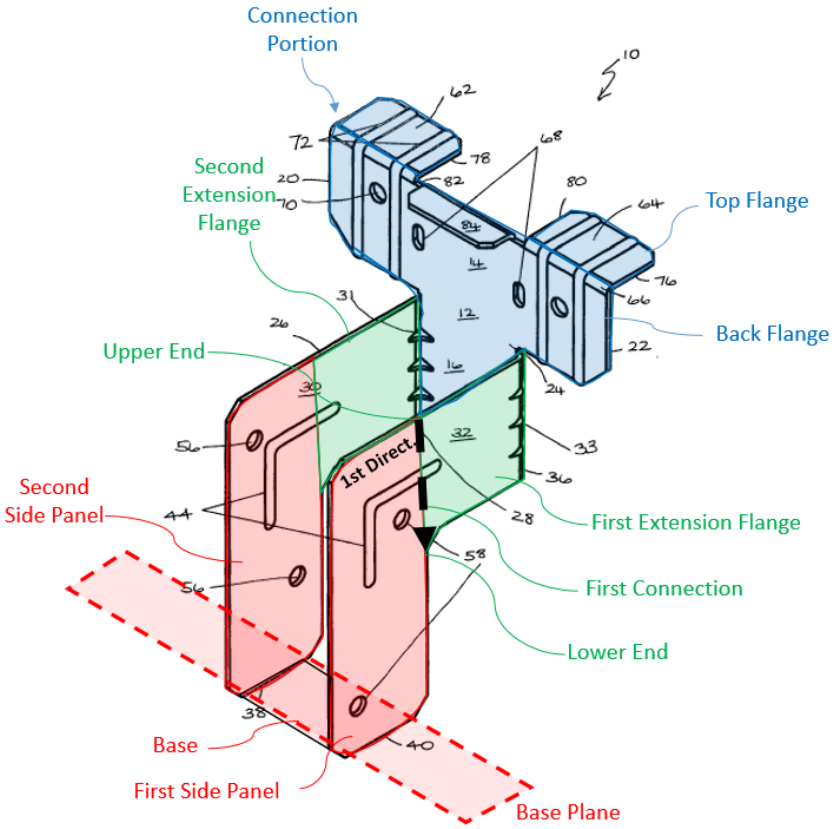


EX1039, FIG. 1 (annotated).

3) First Extension Flange Directly Attached to Channel-Shaped Portion

As discussed regarding claim 1, Cullen also discloses that the extension portion includes a first extension flange. Cullen further discloses that the first extension flange (sidewall 32) is directly attached to the channel-shaped portion (leg 40) by a first connection, as shown by the black dashed line between the green and red portions below. EX1039, FIG. 1; EX1003, ¶217. The first connection has

an upper end and a lower end and extending from the upper end to the lower end in a first direction (i.e., vertically) that is perpendicular to the horizontal base plane, shown below. EX1039, FIG. 1; EX1003, ¶217.

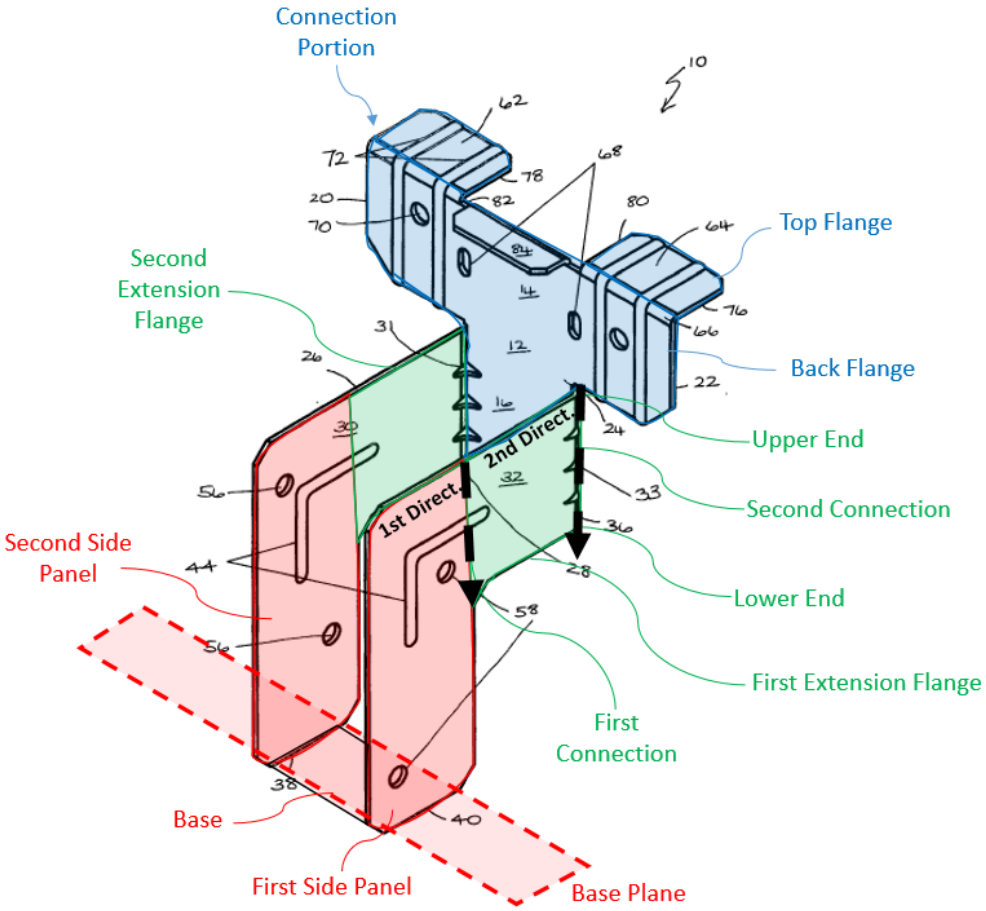


EX1039, FIG. 1 (annotated)

4) First Extension Flange Directly Attached to Connection Portion

Cullen discloses that the first extension flange is directly attached to the connection portion by a second connection, shown below, at bend 36 where sidewall 32 meets back plate 12. EX1039, FIG. 1, 10:22–26; EX1003, ¶218. The second connection has an upper end and a lower end and extends from the upper

end to the lower end in a second direction that is parallel to the first direction (i.e., vertical) and perpendicular to the horizontal base plane, shown below. EX1039, FIG. 1; EX1003, ¶218.

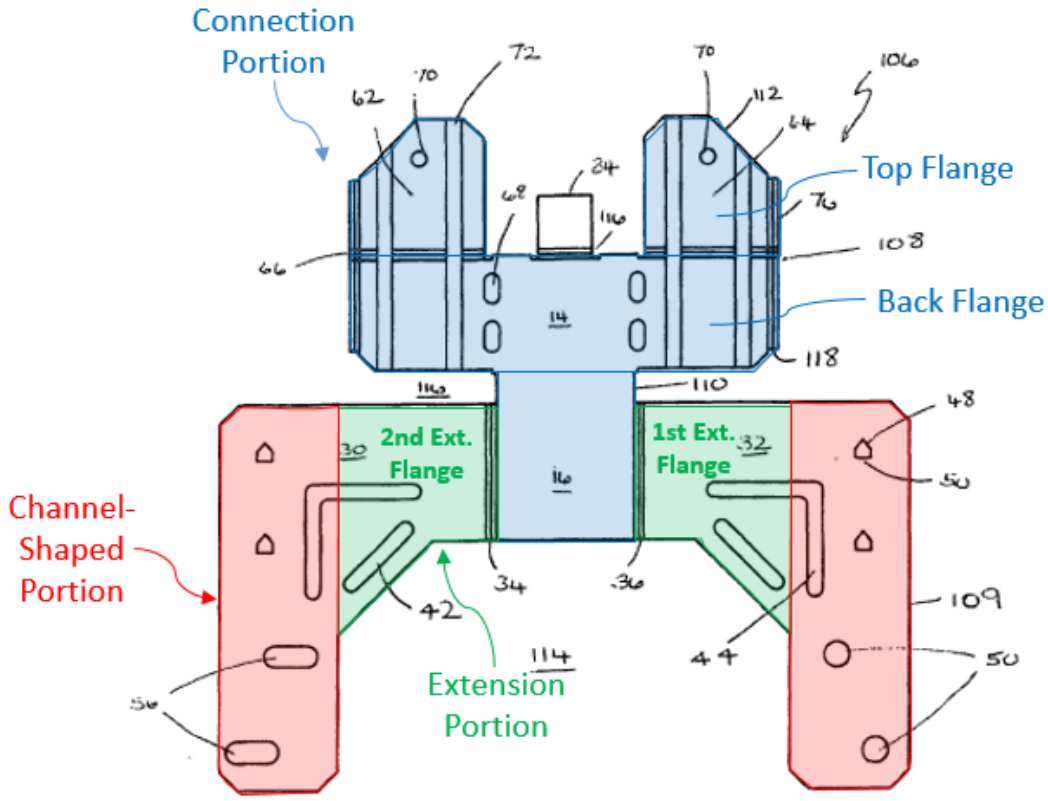


EX1039, FIG. 1 (annotated).

5) First Extension Flange and Channel-Shaped Portion as One Piece

Cullen discloses that the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal (blank 106). EX1039, 10:12–14; 18:8–19:7. And as discussed for claims 42 and 95, in employing the teachings of

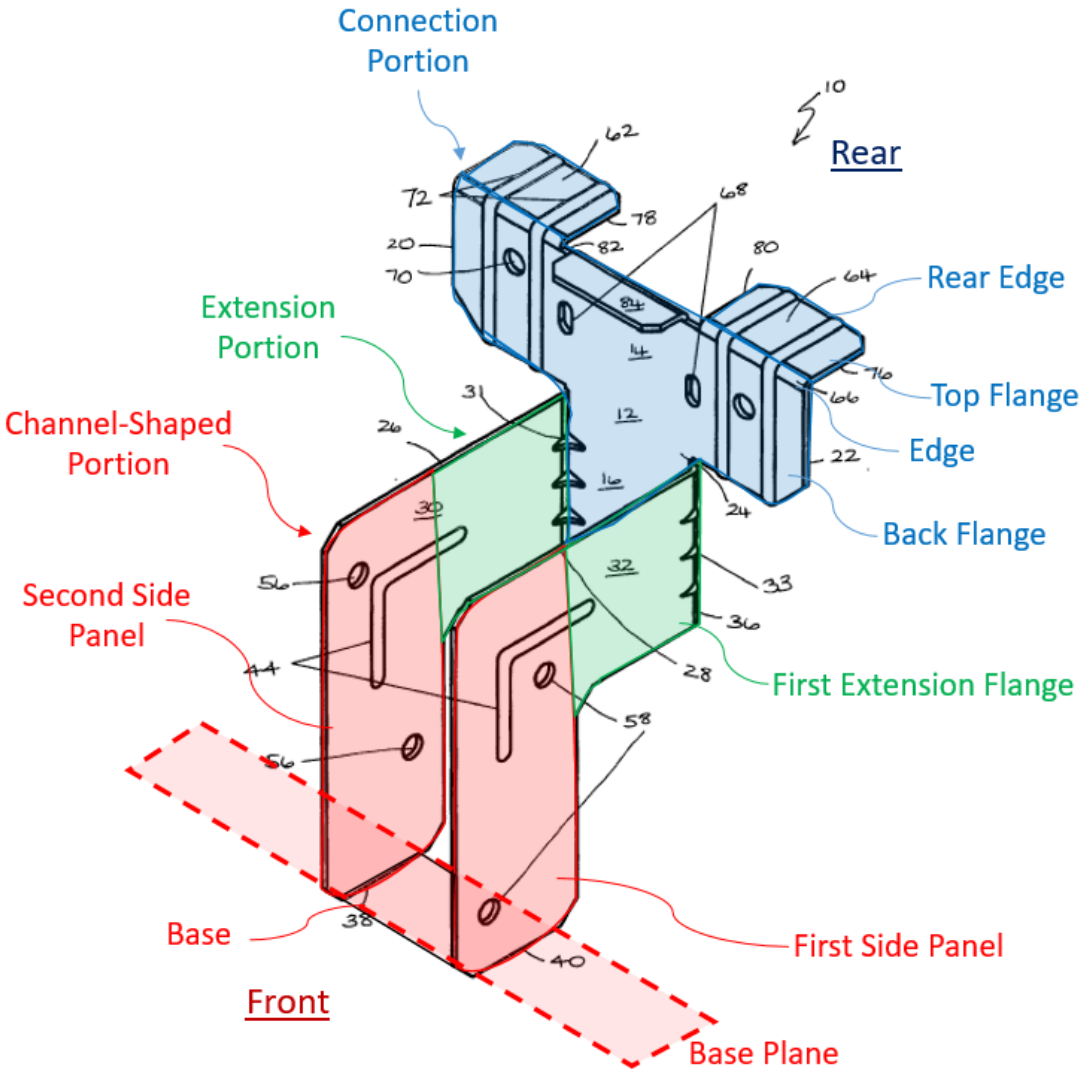
Cullen's seat with hanger 10, a POSITA would have found it obvious to include a base with legs 38/40 as a one-piece design by bending a lower portion of one or both legs 38/40 inward to form a surface to receive the structural member. EX1003, ¶219.



EX1039, FIG. 4 (annotated).

6) Top Flange's Rear Edge

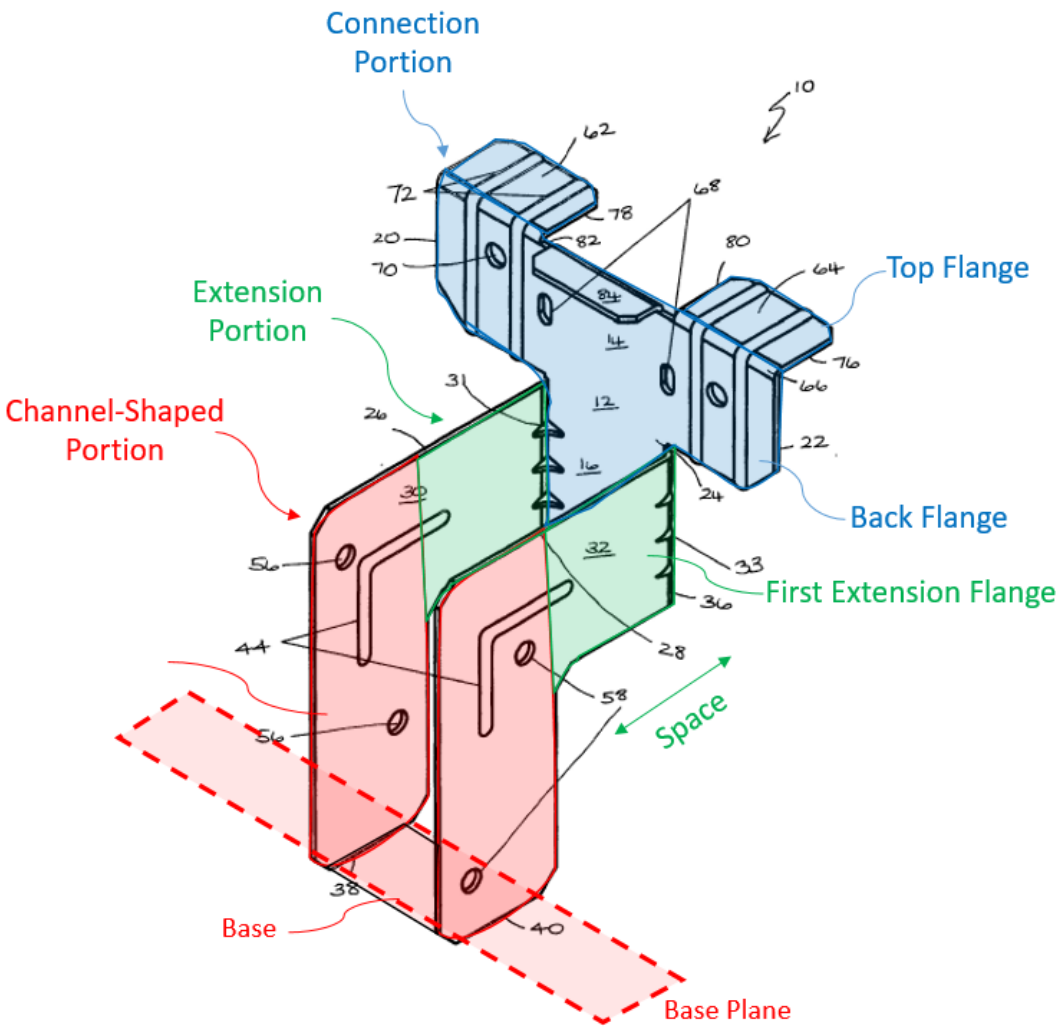
Cullen discloses that the top flange includes a rear edge (annotated below) located rearwardly of the edge (fold line 66) of the top flange from which the back flange extends and that the rear edge is located rearwardly of the back flange, shown below. EX1039, FIG. 1; EX1003, ¶220.



EX1039, FIG. 1 (annotated).

7) Channel-shaped Portion Spaced Apart From Connection Portion

Cullen discloses the channel-shaped portion and the connection portion are spaced apart from one another by the distance defined by the extension portion extending therebetween—long enough to allow two layers of 5/8" drywall to be inserted, as taught by Bundy. EX1039, 10:29–30; EX1003, ¶¶221-222.

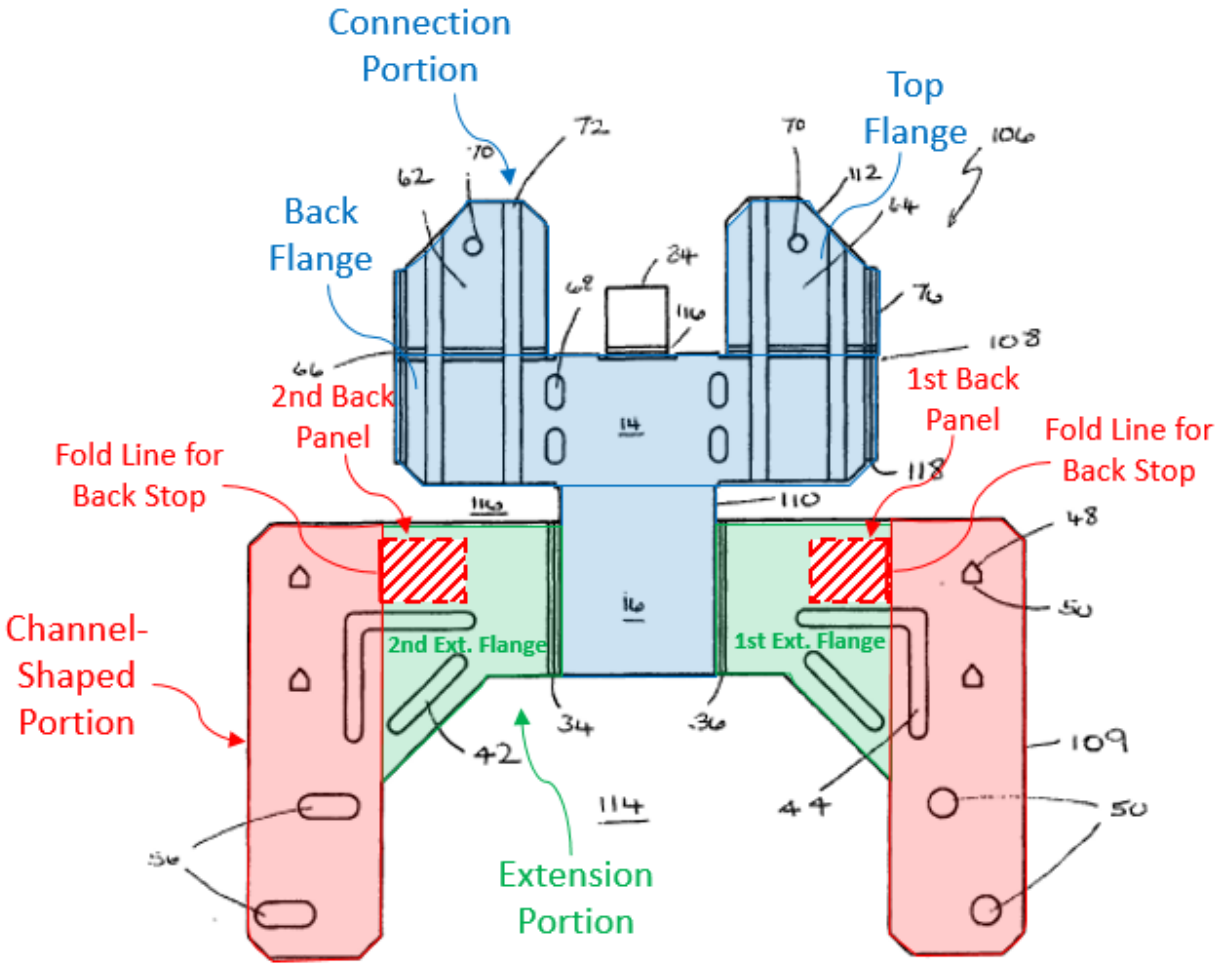


EX1039, FIG. 1 (annotated).

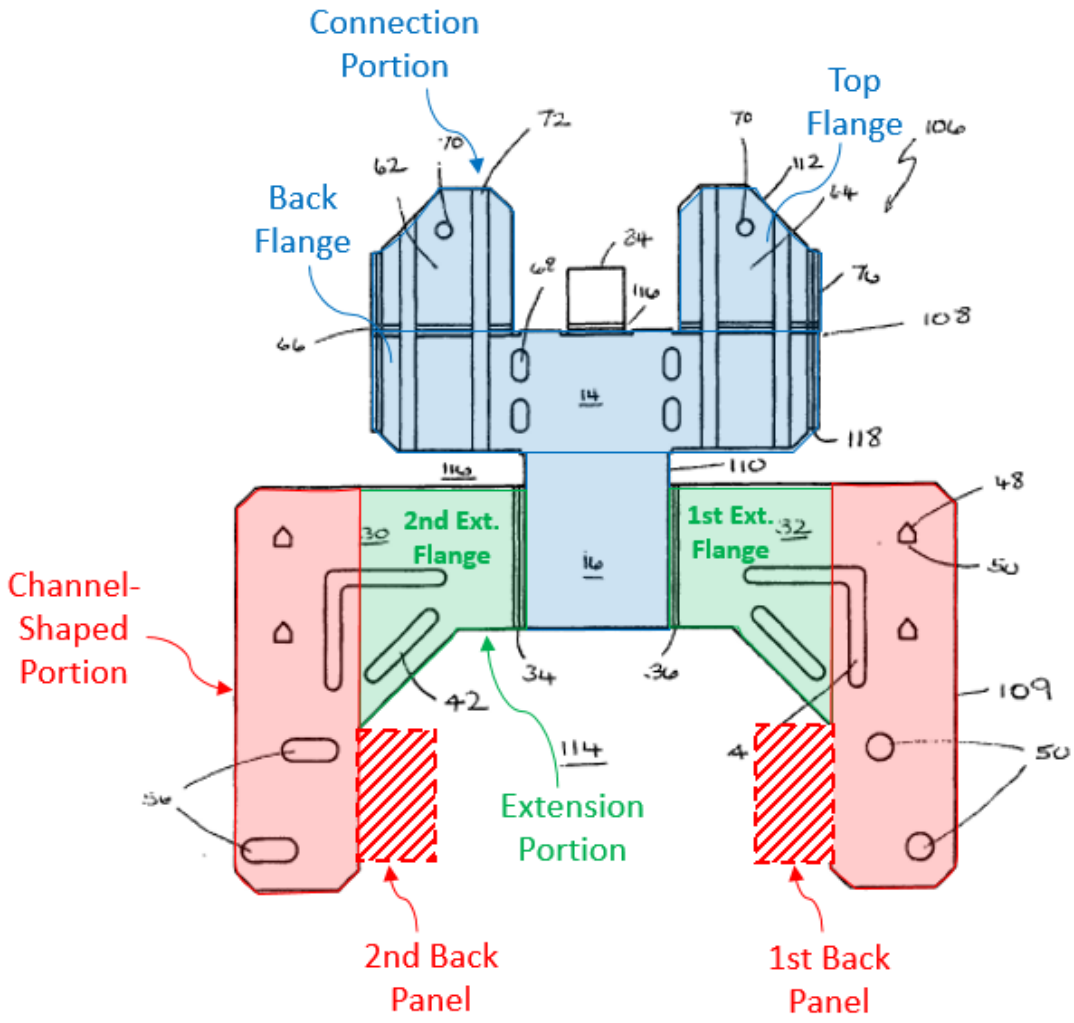
N. Claims 51 and 104

1) Stop Comprising First and Second Back Panels

As discussed for claims 50 and 103, modifying Cullen's hanger to include inward-bent back plate members as taught by Bundy would have resulted in first and second back panels extending toward each other. EX1003, ¶223; EX1007, 4:39-46.



EX1039, FIG. 4 (annotated).

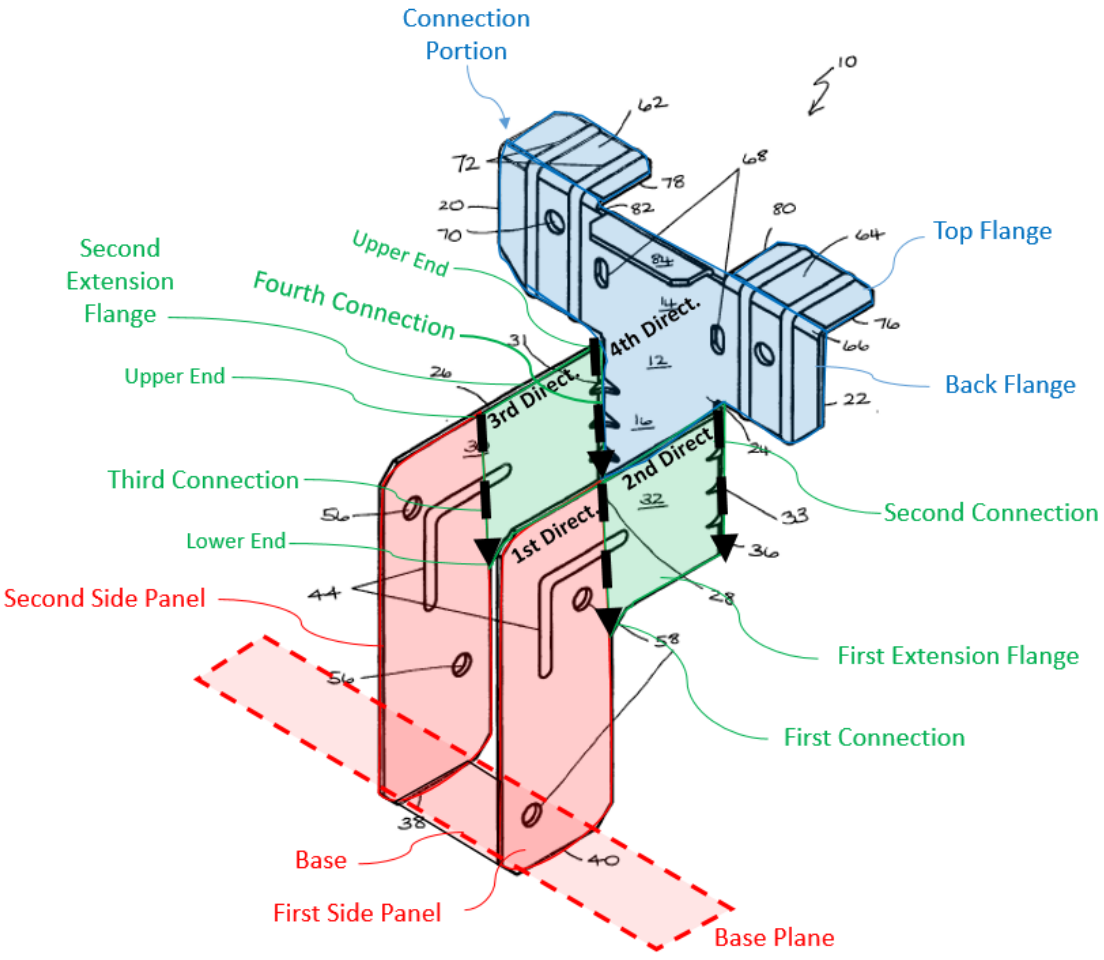


EX1039, FIG. 4 (annotated).

2) Second Extension Flange

As discussed for claims 41 and 94, Cullen discloses that the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion. The second extension flange is directly attached to the channel-shaped portion by a third connection (annotated below) and to the connection portion by a fourth connection (bend 34), shown below. EX1039,

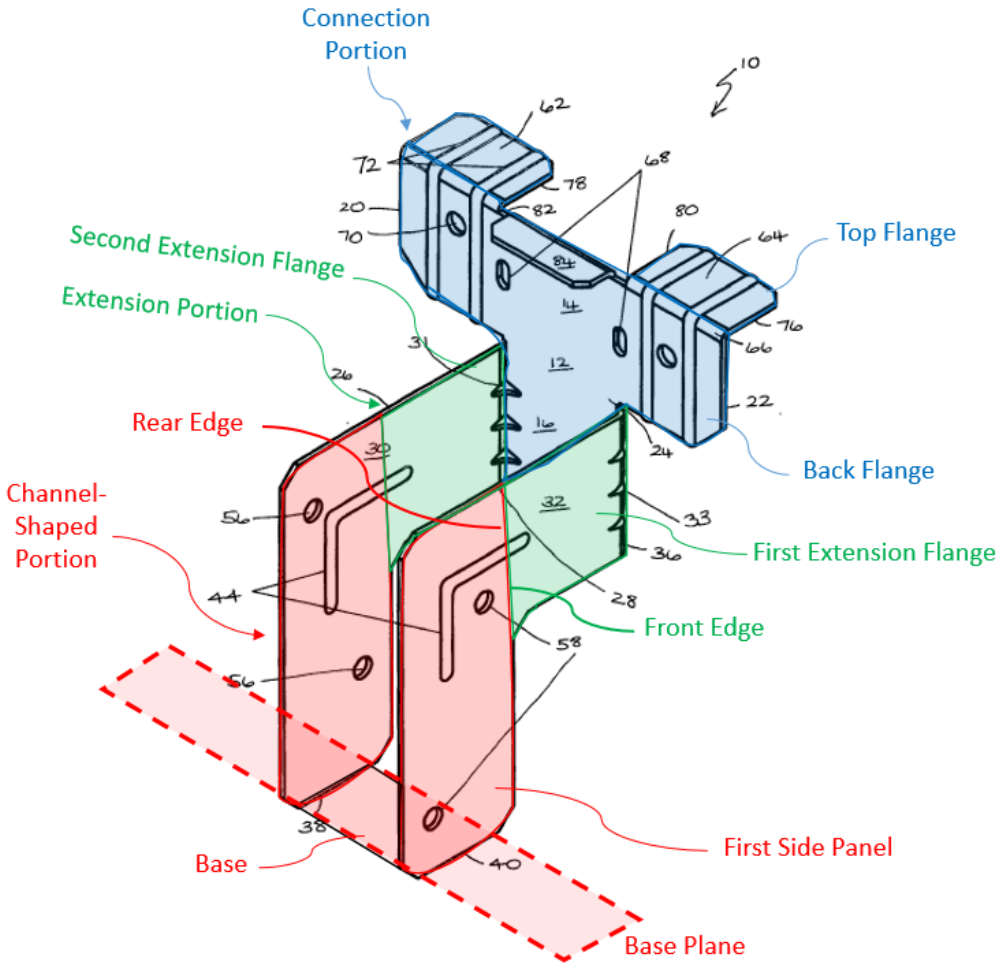
10:25–30, FIG. 1; EX1003, ¶224. The third and fourth connections (annotated below) each have an upper end and a lower end and extends from the upper end to the lower end in a third direction and fourth direction, respectively, shown below. EX1039, FIG. 1; EX1003, ¶224. Cullen discloses the third and fourth directions being parallel to the first and second directions (i.e., vertical) and being perpendicular to the horizontal base plane, shown below. EX1039, FIG. 1; EX1003, ¶224.



EX1039, FIG. 1 (annotated).

3) First Side Panel

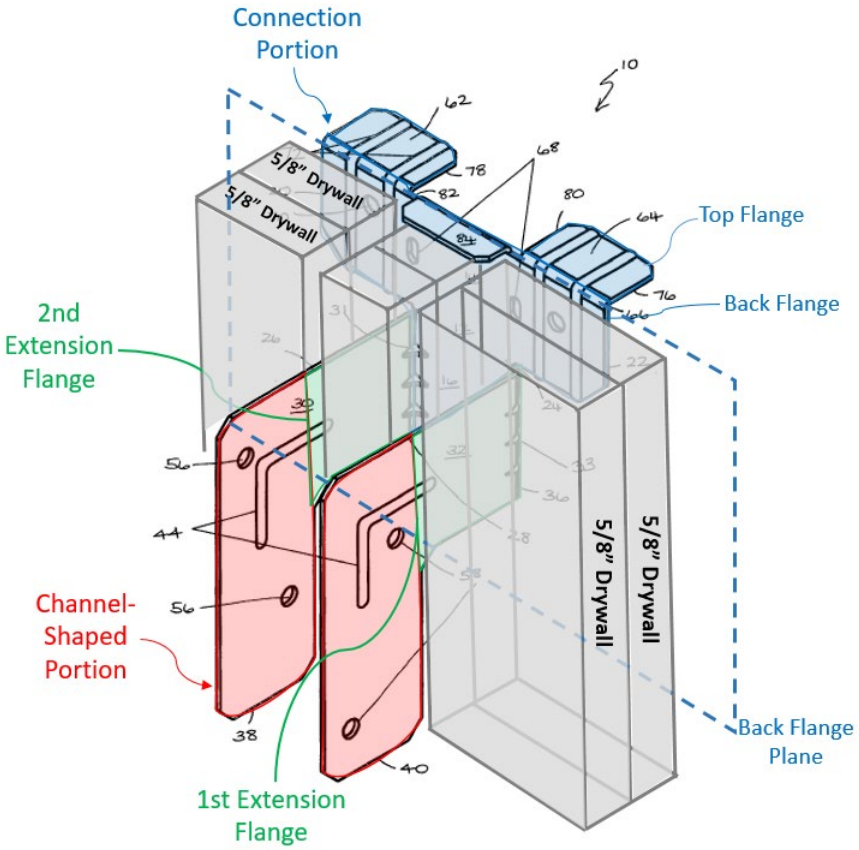
As discussed for claims 42 and 95, Cullen renders obvious a channel-shaped portion including a first side panel extending upward from the base. EX1003, ¶225. Cullen discloses a front edge of the first extension flange (sidewall 32) abutting a rear edge of the first side panel (leg 40), shown below. EX1039, FIG. 1; EX1003, ¶225.



EX1039, FIG. 1 (annotated).

4) Drywall Space

As discussed in §VIII.A, employing the teachings of Bundy's drywall space with Cullen's hanger 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 the channel-shaped portion, first and second extension flanges, and back flange (whose front surface defines the back flange plane) define the drywall space's size and shape, they bound the drywall space. EX1039, FIG. 1; EX1007, 5:10-22; EX1003, ¶¶226-227.

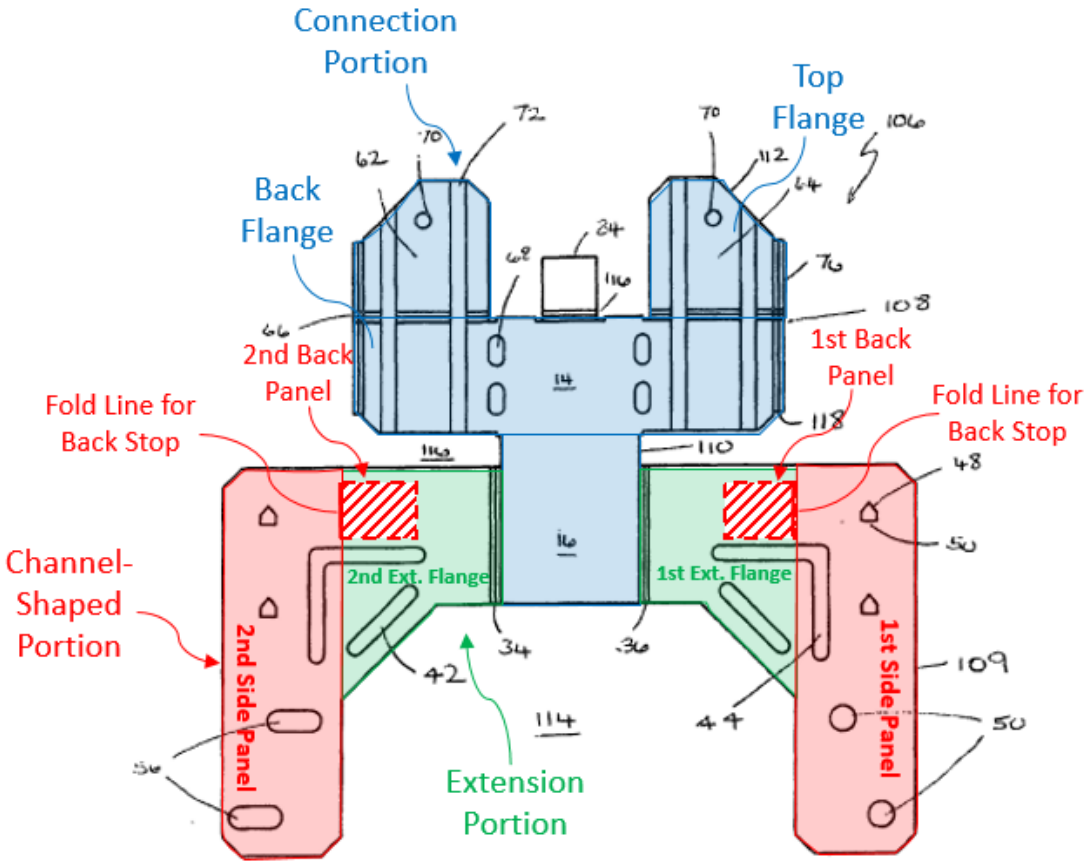


EX1039, FIG. 1 (annotated).

O. Claims 52 and 105

1) First and Second Back Panels Directly Attached to First and Second Extension Flanges

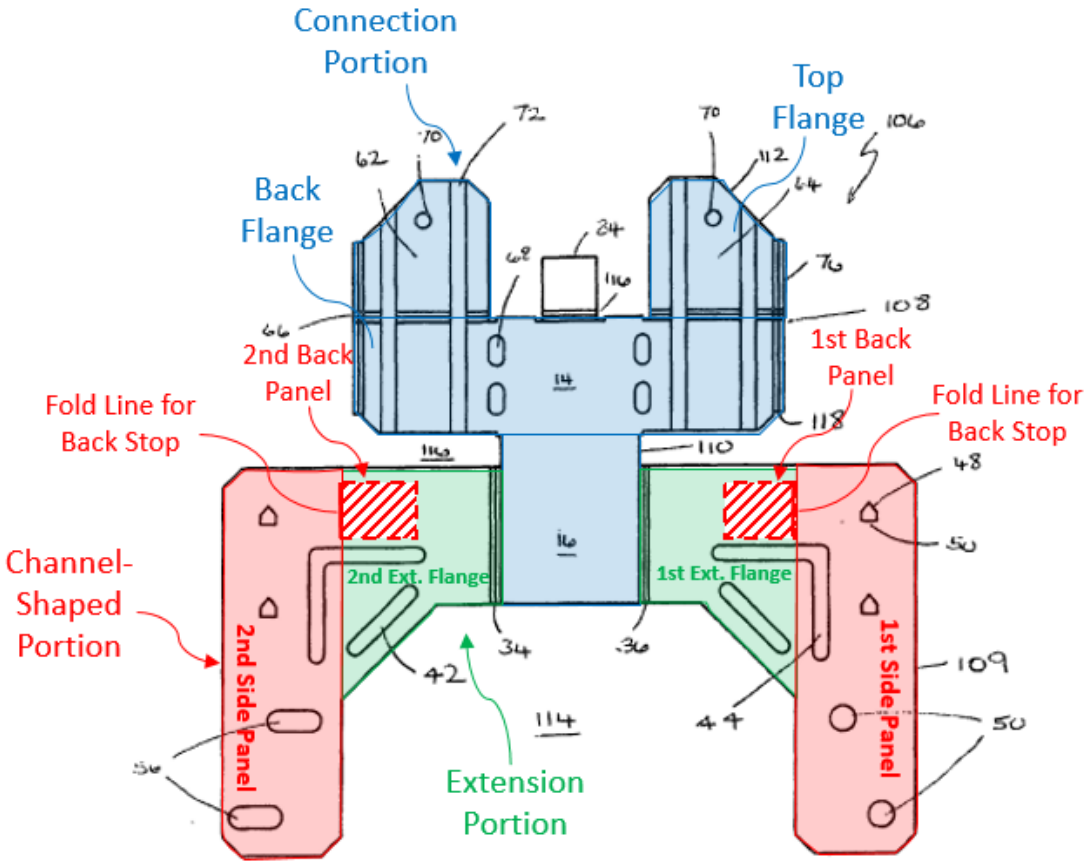
Given the teachings of Bundy's inward-bent back plate members 9, a POSITA would have been motivated to directly attach, via bending, one of Bundy's inward-bent back panels to Cullen's first extension flange (sidewall 32) and the other of Bundy's inward-bent back panels to Cullen's second extension flange (sidewall 30). EX1003, ¶228. Bundy teaches bending in back plate members 9 at the rear edge of its channel-shaped portion. EX1007, 4:41–46. A POSITA would have understood that punching out and bending a section of Cullen's sidewalls 30/32 inward at the rear edge of legs 38/40, as taught by Bundy, would provide the benefits of the back panels using the least amount of sheet metal. When such bending of the sidewalls is implemented in Cullen at a location that would be in front of any inserted drywall, as taught by Bundy, such bends would also directly attach to the extension flanges at the top and bottom corners of the respective bent sections, given the location of Cullen's sidewalls vis-à-vis its extension flanges. EX1003, ¶228. Thus, Cullen-Bundy renders obvious the first back panel directly attached to the first extension flange and the second back panel directly attached to the second extension flange. *Id*.



EX1039, FIG. 4 (annotated).

2) One-Piece of Sheet Metal

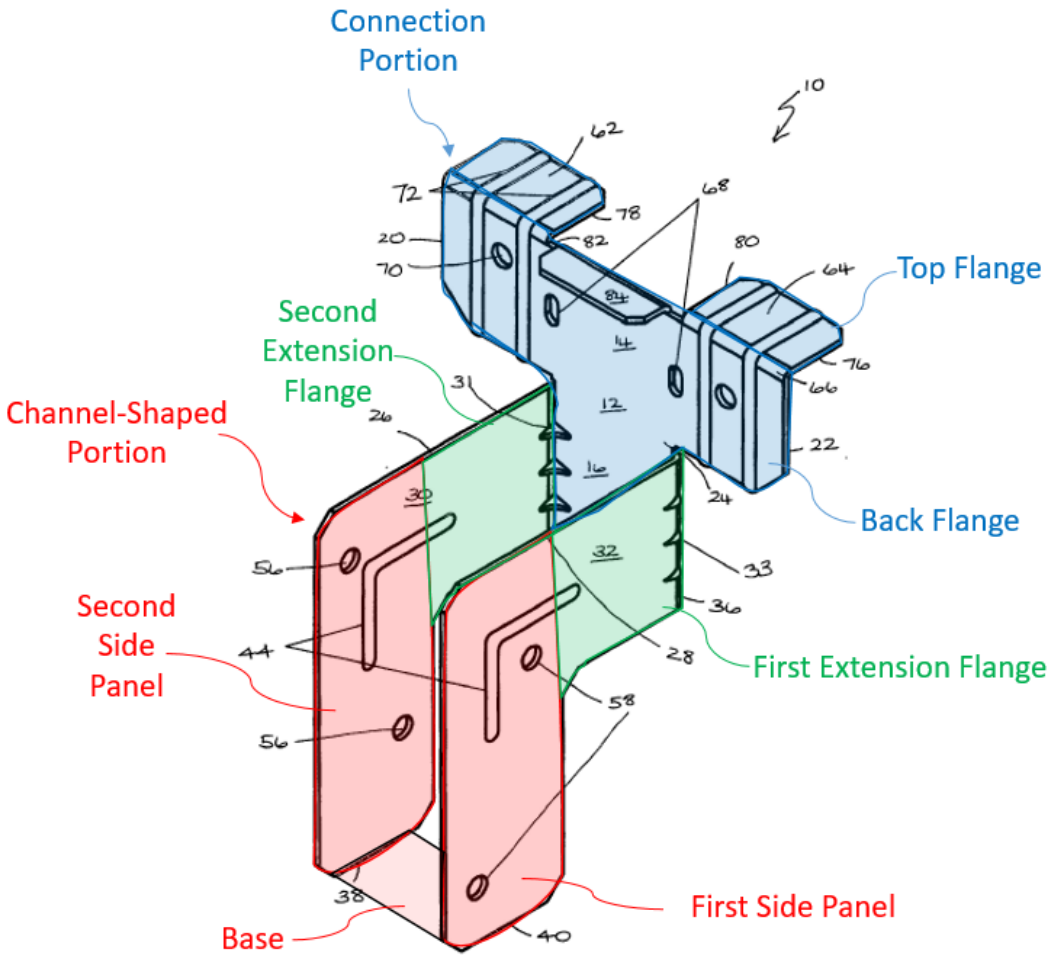
As discussed for claims 45 and 98, Cullen discloses the channel-shaped portion, the connection portion, and the extension portion being formed as one-piece of sheet metal. EX1039, 10:12–14; 18:8–19:7; EX1003, ¶229.



EX1039, FIG. 4 (annotated).

3) Second Side Panel

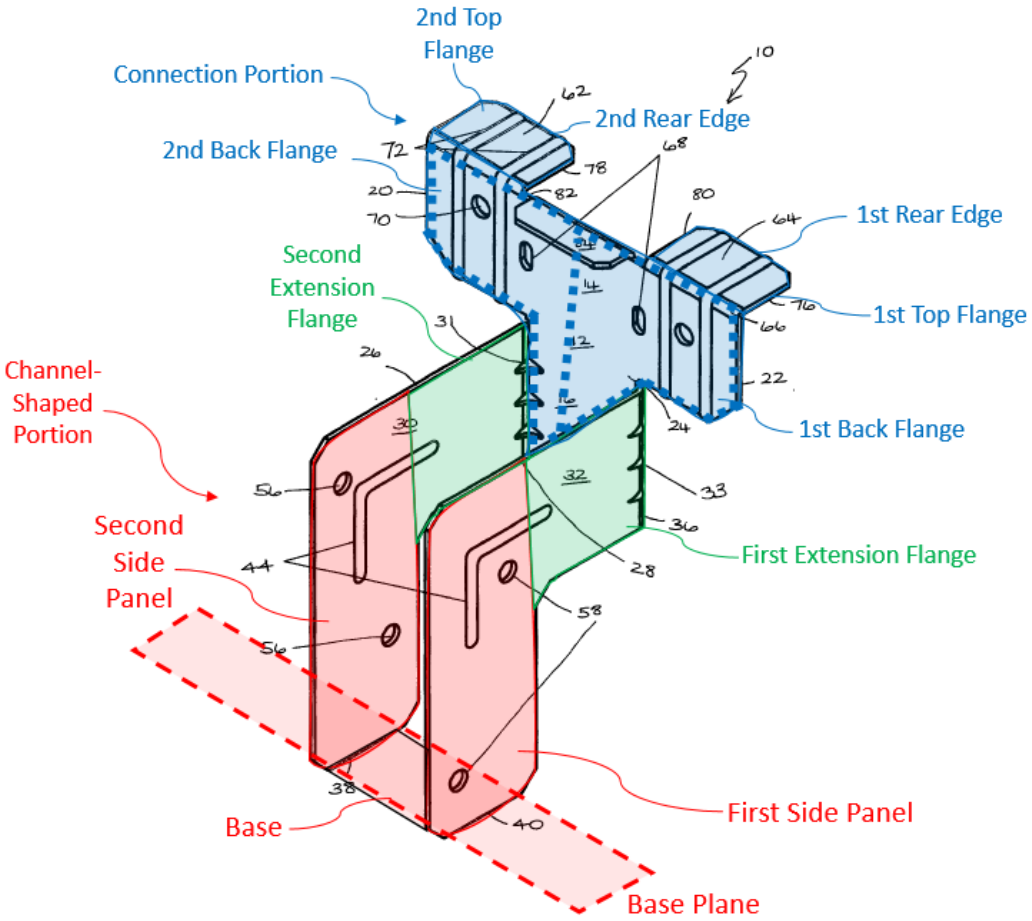
As discussed for claims 42 and 95, Cullen-Bundy discloses a second side panel extending upward from the base, wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other. EX1003, ¶230.



EX1039, FIG. 1 (annotated).

4) First Back and Top Flanges

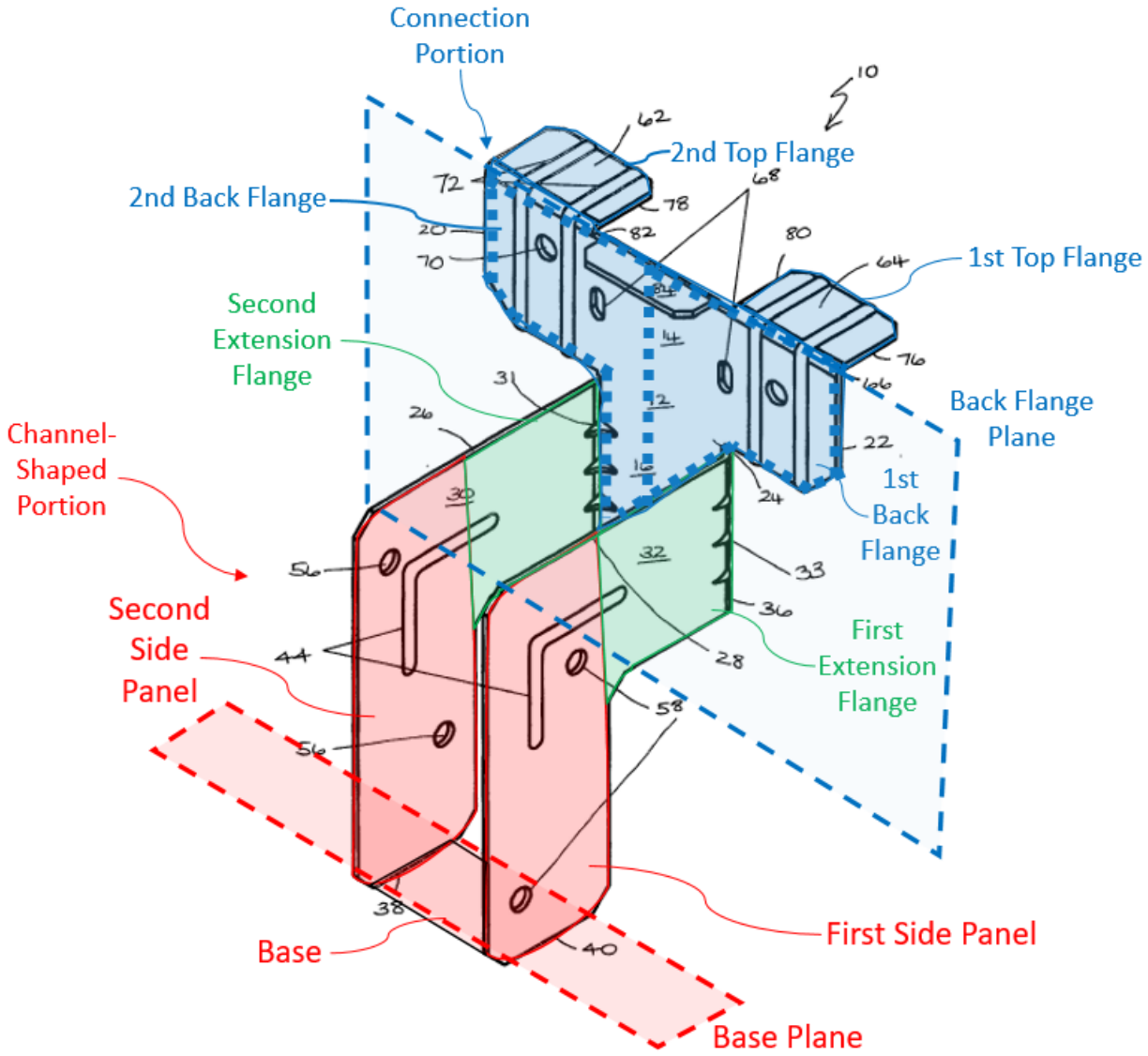
For the reasons discussed for claims 39 and 92, Cullen discloses the back flange being a first back flange, and the top flange being a first top flange. EX1039, 10:16–22, 11:24–29; EX1003, ¶231.



EX1039, FIG. 1 (annotated).

5) Second Back Flange and Second Top Flange

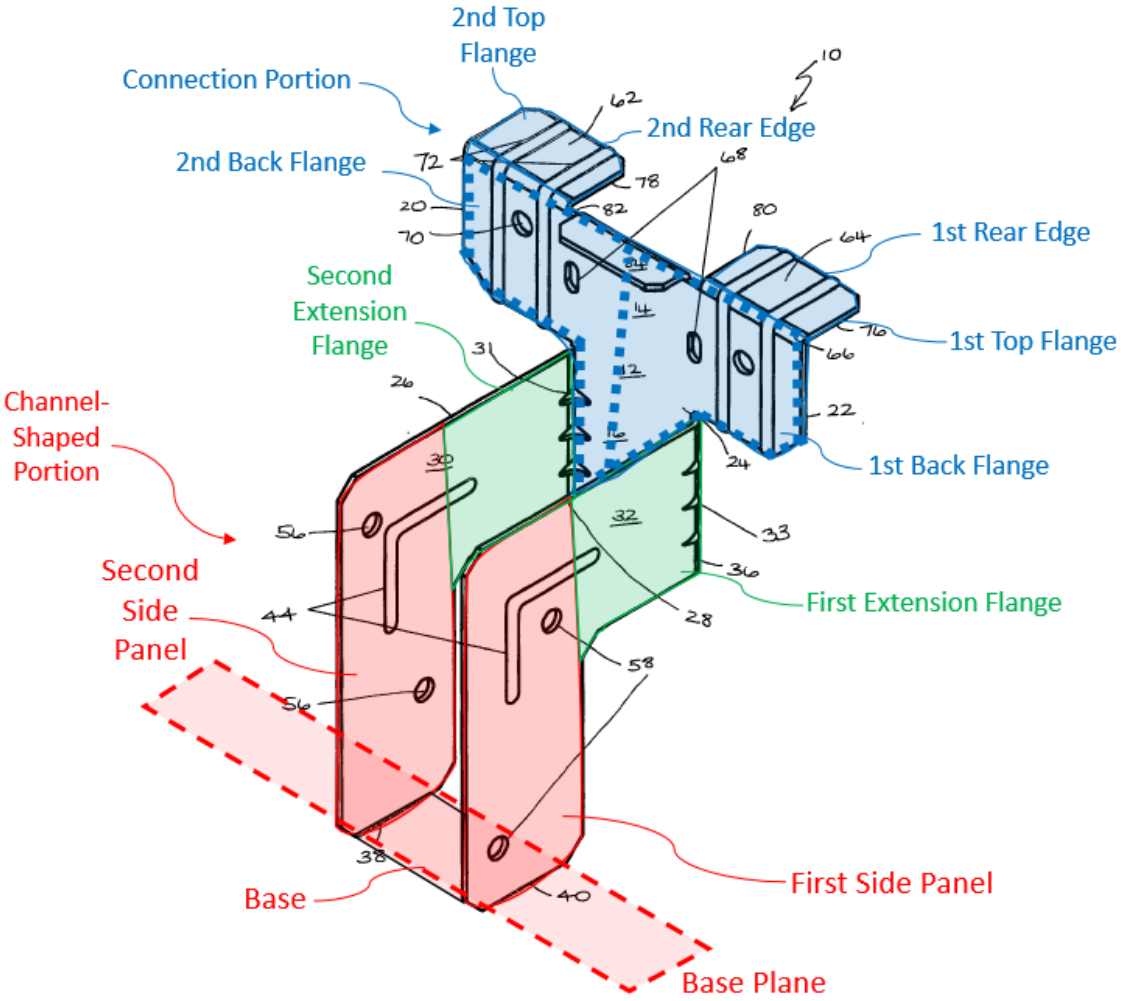
For the reasons discussed for claims 39 and 92, when mounted on a frame wall as taught in Cullen-Bundy, Cullen discloses that the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange and 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. EX1003, ¶232.



EX1039, FIG. 1 (annotated).

6) Extension Flanges Extending From Back Flanges to Channel-Shaped Portion

As discussed for claims 1.3.A, 39, 41, and 94, Cullen discloses that the first extension flange extends from the first back flange to the channel-shaped portion and that the second extension flange extends from the second back flange to the channel-shaped portion. EX1039, 10:22–30; EX1003, ¶233.

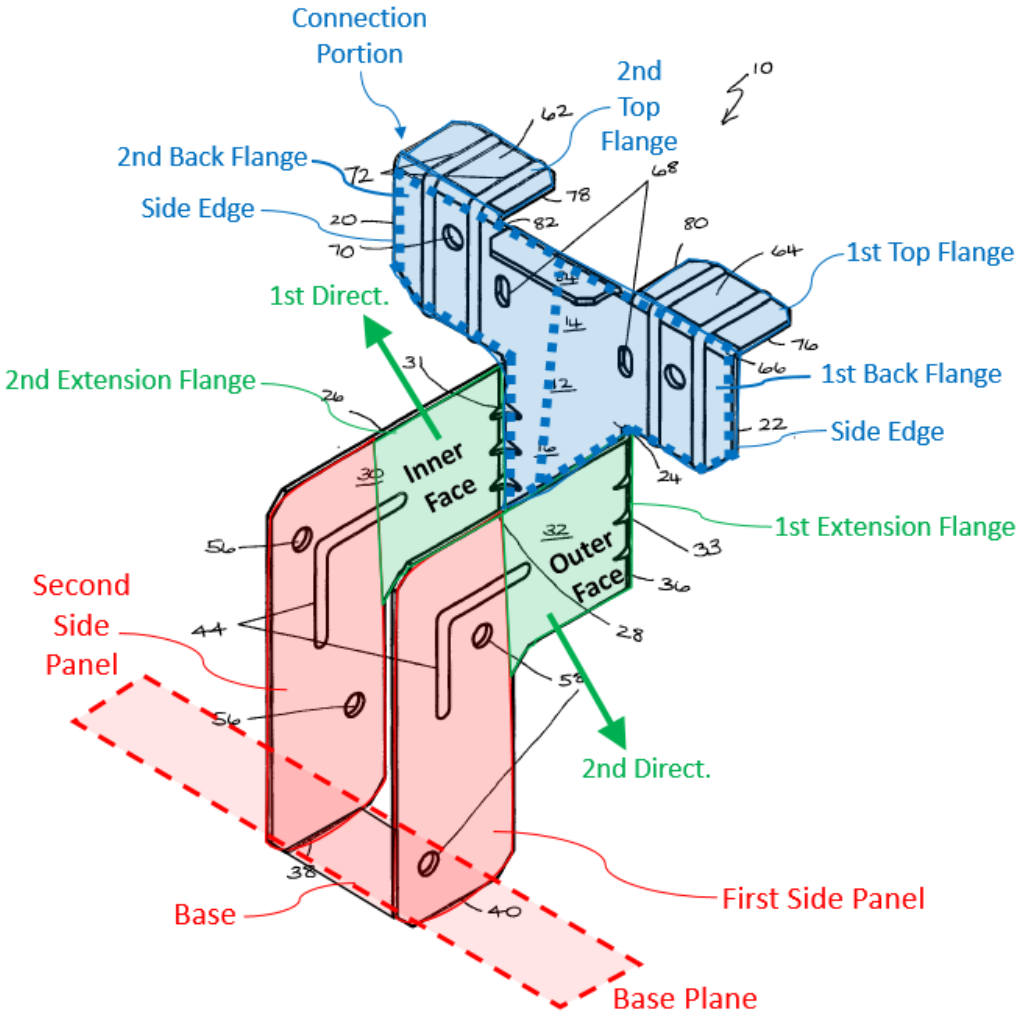


EX1039, FIG. 1 (annotated).

7) Inner and Outer Faces of Extension Flanges and Side Edge of Back Flanges

Cullen discloses that the first and second extension flanges (sidewalls 30/32) each include an inner face and an outer face (annotated below) because they are made of sheet metal with a thickness. EX1039, 10:29–30. Because sidewalls 30/32 are parallel to each other, Cullen discloses that the inner faces of the first and second extension flanges face one another—the inner face of the first extension

flange (sidewall 32) facing in a first direction toward the inner face of the second extension flange (sidewall 30), and the outer face of the first extension flange facing in a second direction that is opposite the first direction, shown below. EX1039, FIG. 1, 10:25-26; EX1003, ¶234.



EX1039, FIG. 1 (annotated).

Cullen further discloses the first back flange (right-half of back plate 12) having a side edge disposed outward, in the second direction, of the outer face of

the first extension flange (sidewall 32), as shown above. EX1039, FIG. 1; EX1003, ¶235. Cullen further discloses the second back flange (left-half of back plate 12) having a side edge disposed outward, in the first direction, of the outer face of the second extension flange (sidewall 30). EX1039, FIG. 1; EX1003, ¶¶235-236.

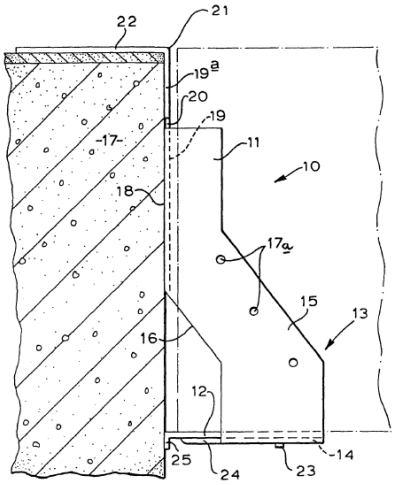
VIII. Claims 1, 22–27, 39–45, 50–53, 74–79, 92–98, and 103–105 Would Have Been Obvious over Adams in view of Bundy.

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, ¶¶237-238. 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.

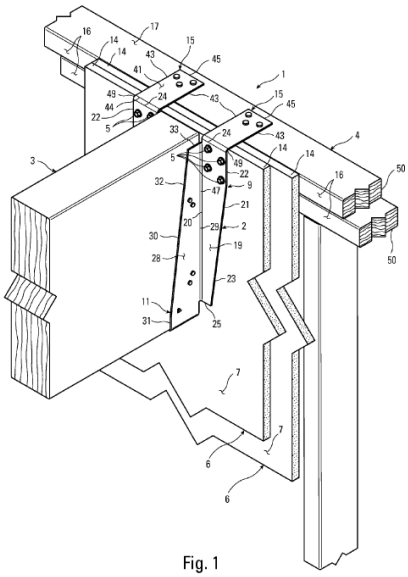
A. Motivation to Modify Adams Based on the Teachings of Bundy.

Adams and Bundy are both directed to joist hangers. EX1003, ¶¶32–42, 239. 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, ¶239. "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-inch-thick-layers of drywall between its channel-shaped portion and the front face 6 of the wall's support member 4. *Id*., EX1003, ¶¶240-241; EX1007, 5:16-18. Two 5/8-inch-thick layers of drywall are commonly used for a fire separation wall. EX1003, ¶241.



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, ¶242. 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, ¶242. 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-inch-thick drywall therebetween

according to the size preference described by Bundy for optimal fire protection and wall integrity. EX1003, ¶242; 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-inch-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, ¶242.

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-inch-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, and Adams's abutment portion 19 and base 14 already define a space therebetween. EX1040, 4:13–19; EX1003, ¶243. 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-inch-thick drywall while still allowing Adams's hanger to secure a joist's end to a frame wall. EX1003, ¶243; 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, ¶243.

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,"

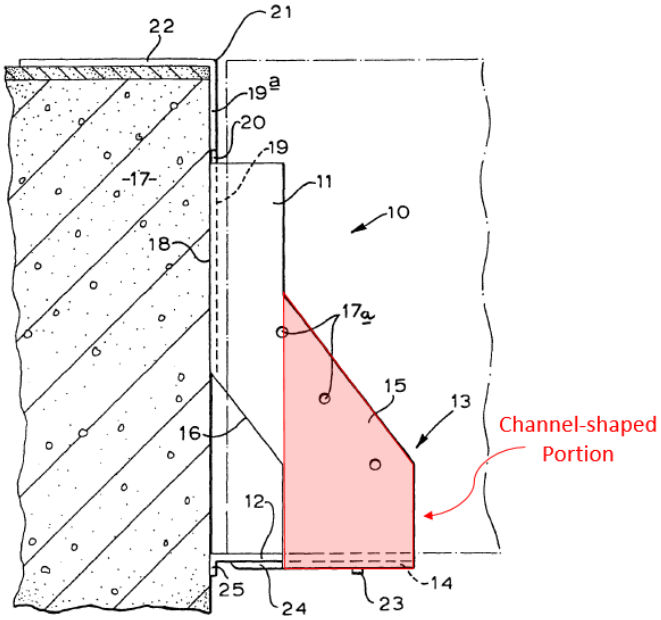
As discussed above as to Yamaguchi and Cullen, the preamble of claim 1 is not limiting because claim 1's body recites a structurally complete invention and uses the preamble only to state a purpose or intended use.

To the extent that the preamble is limiting, the Adams-Bundy combination ("Adams-Bundy") renders obvious such a hanger. EX1003, ¶¶244-245. 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 §VII.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, ¶245; 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 directly thereto when supporting element 17 is a timber wall. EX1003, ¶245. Accordingly, it would have

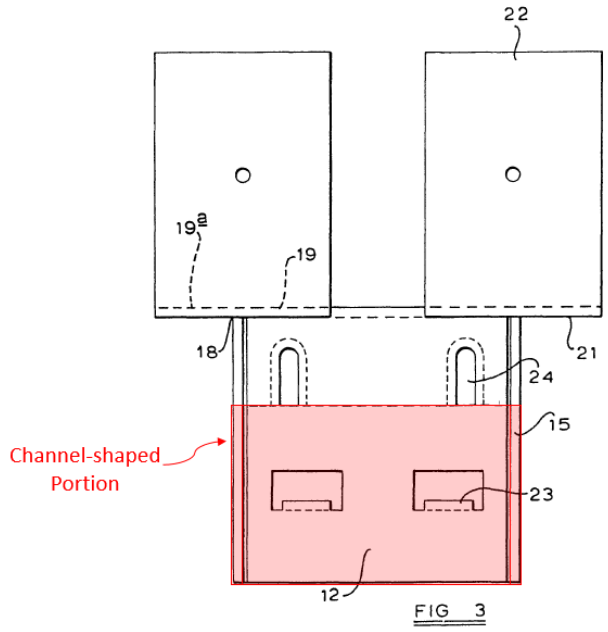
been obvious to a POSITA to use Adams's hanger as modified by Bundy to connect a structural component to a top plate of a frame wall adapted to have the requisite drywall mounted thereon. *Id*. Such a modification would have been simply applying a known technique (Bundy's use of a hanger on a frame wall with two layers of 5/8-inch-thick 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-inch-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, ¶¶246-248.

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

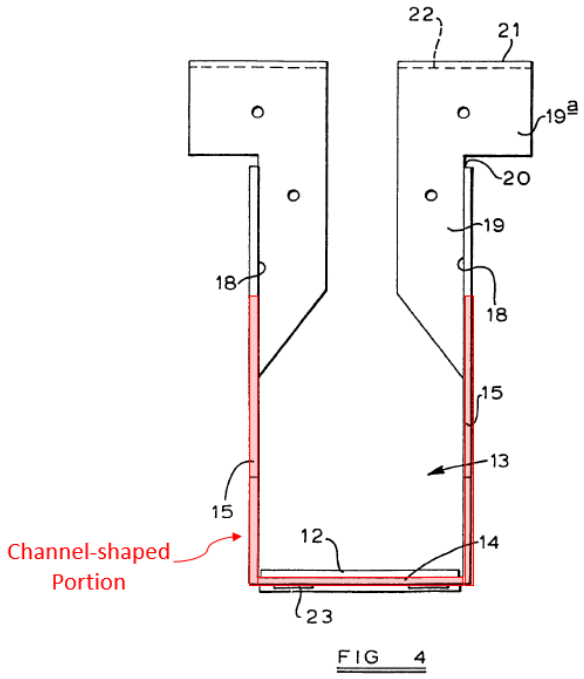
Adams discloses a channel shaped portion (e.g., base 14 and portions of sidewalls 15 thereabove) configured to receive the structural component (e.g., structural beam). EX1003, ¶¶249-250; EX1040, 4:2-5, FIGS. 2-4.



EX1040, FIG. 2 (annotated).



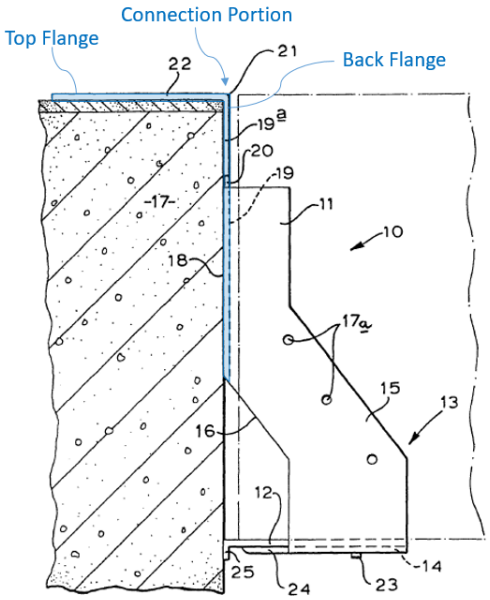
EX1040, FIG. 3.



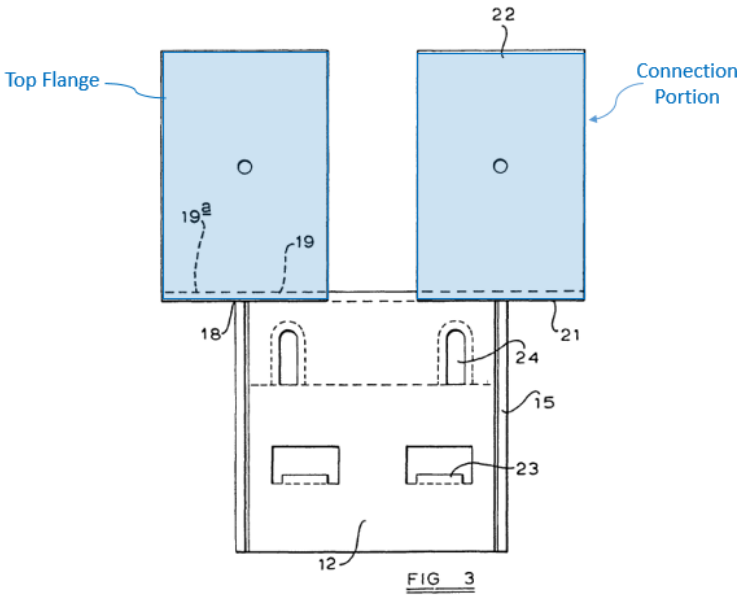
EX1040, FIG. 4 (annotated).

[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,"

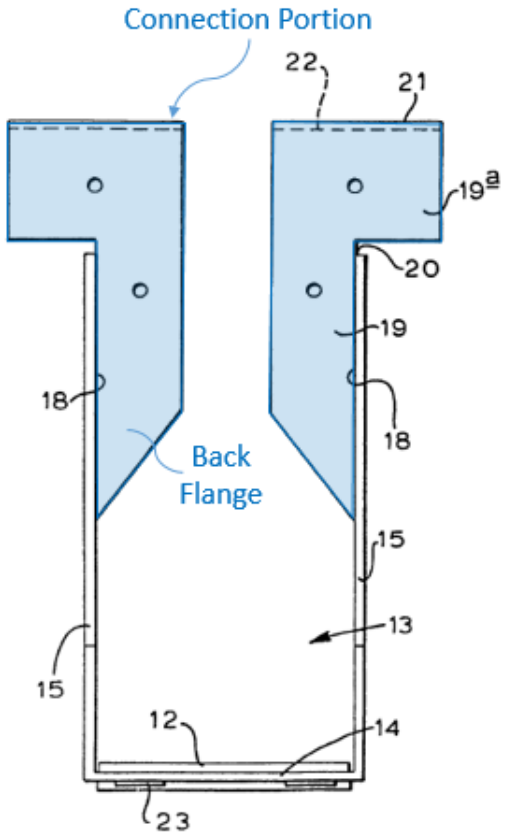
Adams discloses a connection portion that includes a top flange (bearing portion 22) arranged to engage a top surface of a top plate of the frame (timber) wall (support element 17), as taught by Bundy. EX1003, ¶¶251-252; EX1040, 4:34-41, FIGS. 2-4.



EX1040, FIG. 2 (annotated).



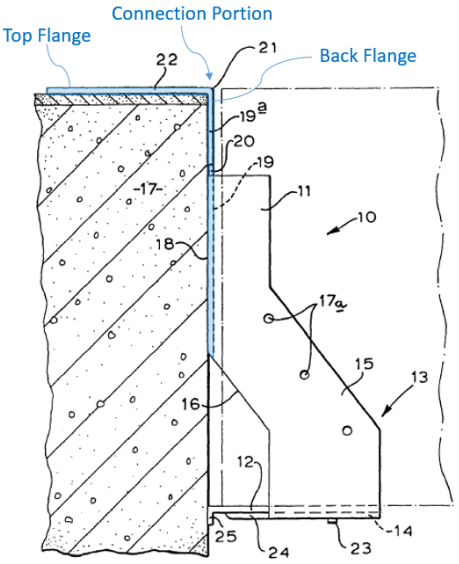
EX1040, FIG. 3 (annotated).



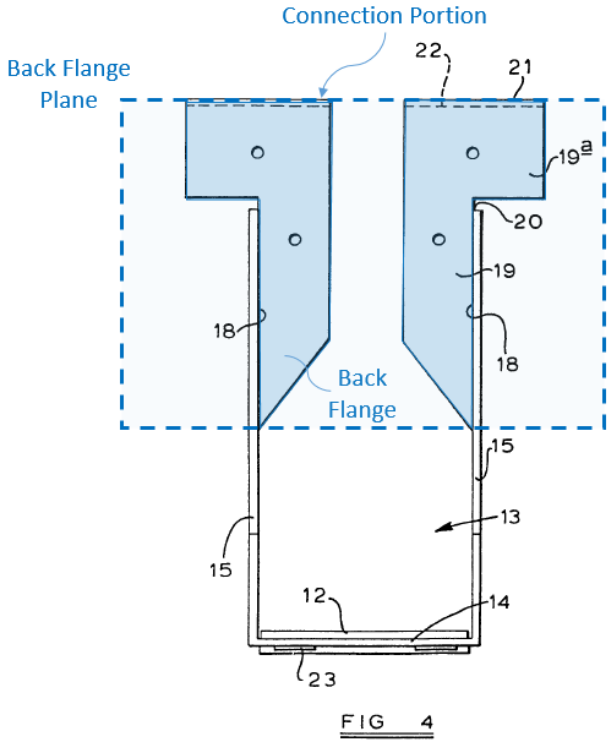
EX1040, FIG. 4 (annotated).

[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-Bundy discloses a back flange (abutment portion 19) extending from an edge (fold line 21) of the top flange 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"). EX1040, 4:22-36, FIGS. 2-3. Adams's back flange has a front surface lying in a back flange plane, shown below. EX1003, ¶¶253-254; EX1040, FIGS. 2-3.



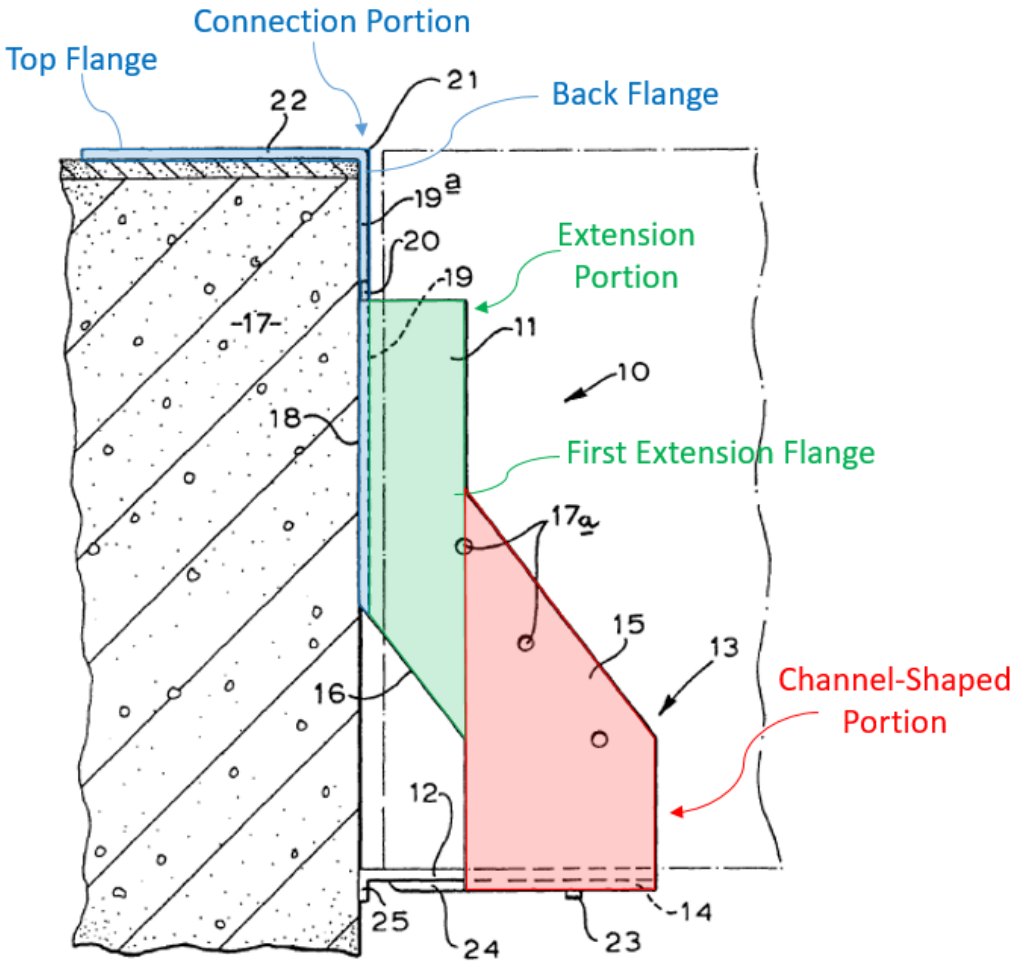
EX1040, FIG. 2 (annotated).



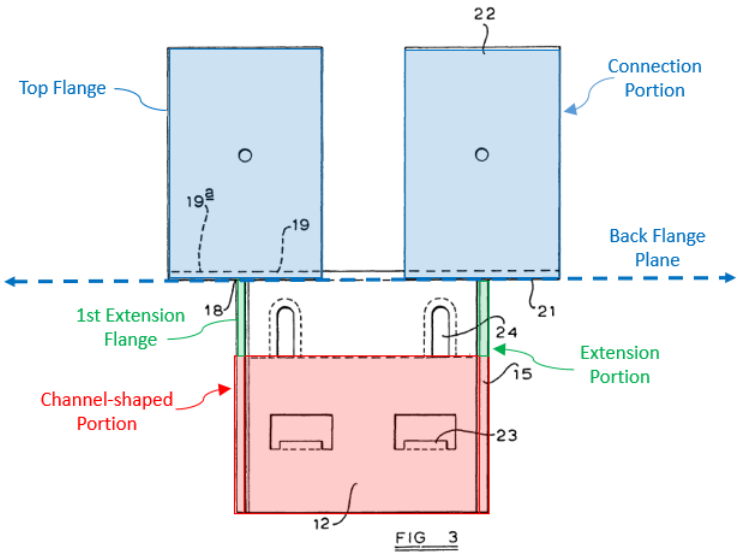
EX1040, FIG. 4 (annotated).

[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;"

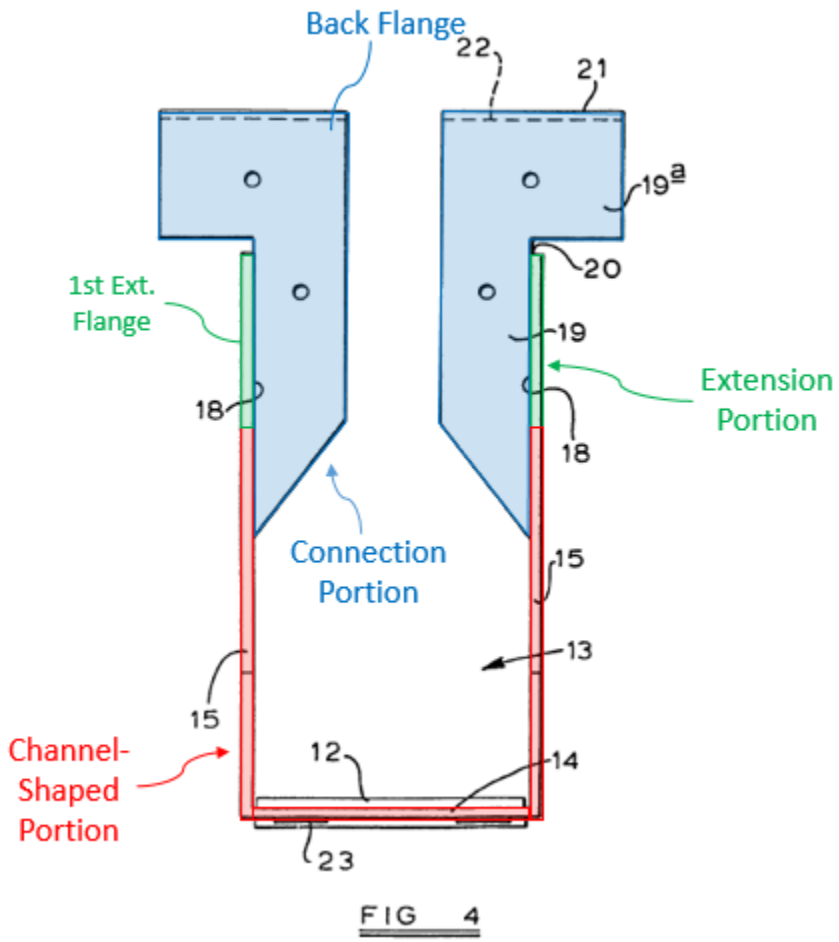
Adams discloses an extension portion (section of sidewalls 15 above edge 16) including a first extension flange (first sidewall 15 above edge 16) extending from the back flange of the connection portion to the channel-shaped portion, as shown in green below. EX1003, ¶¶255-256; EX1040, 4:11-25, FIGS. 2-3.



EX1040, FIG. 2 (annotated).



EX1040, FIG. 3 (annotated).



EX1040, FIG. 4 (annotated).

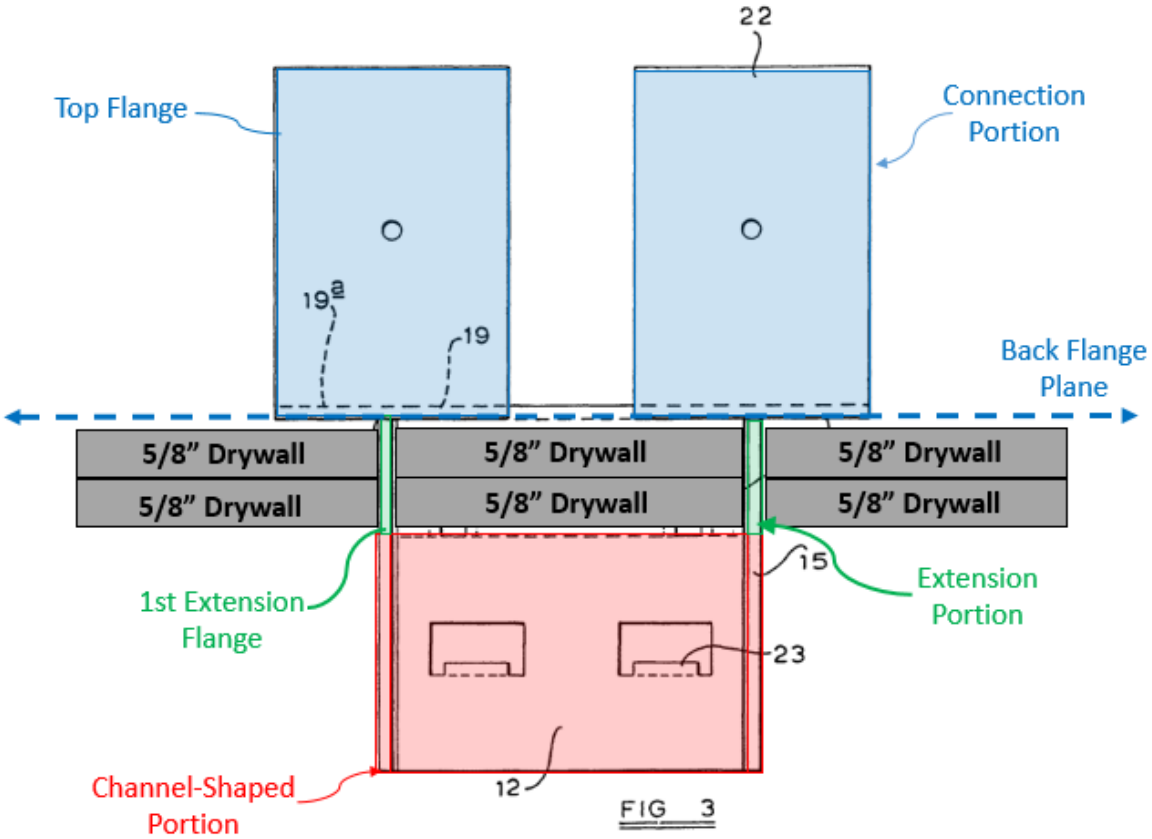
As Adams's extension portion is formed from the same piece of sheet metal as the back flange of its connection portion with no intervening components therebetween, Adams's extension portion extends from its connection portion. EX1003, ¶256.

[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"

Adam's sidewalls 15 define a space that would permit drywall to be inserted between abutment portion 19 and base 14. EX1003, ¶257. While Adams does not explicitly disclose installing two layers of 5/8-inch-thick drywall between 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, for the reasons discussed in §VIII.A above. EX1003, ¶257.

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

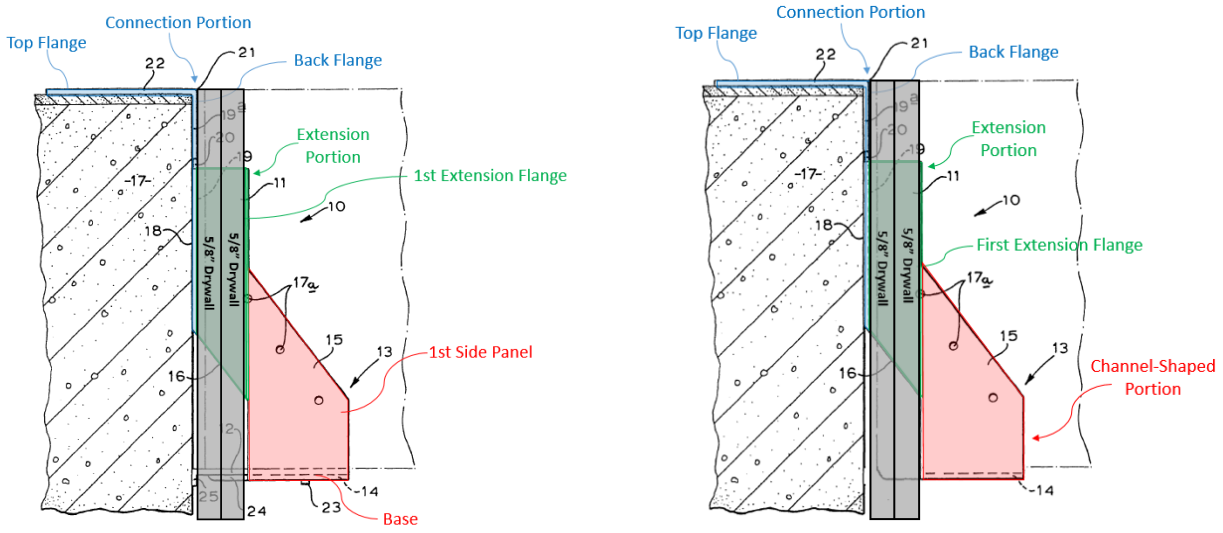
portion 19. EX1003, ¶258. For example, a POSITA would have understood to add two layers of 5/8-inch-thick drywall to the Adams-Bundy hanger under shoe plate 12 and around sidewalls 15, along with an insert of two layers of 5/8" drywall above shoe plate 12 and between sidewalls 15. *Id*.



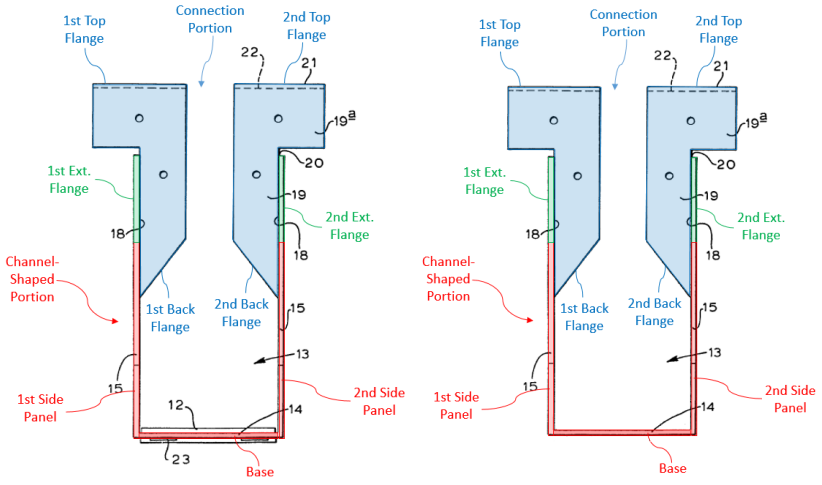
EX1040, FIG. 3 (annotated).

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, ¶259; 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, ¶259. 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, ¶¶259-260.



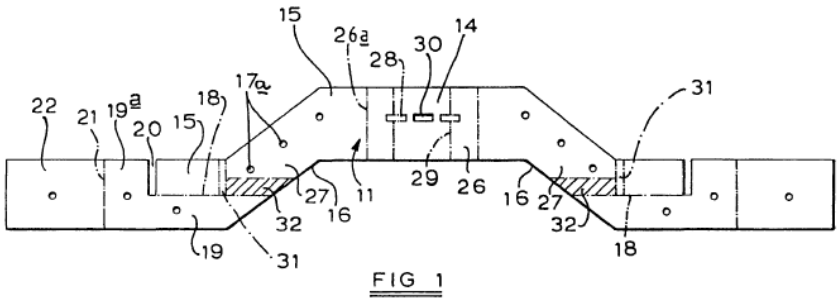
EX1040, FIG. 2 (annotated, rendering without shoe plate)



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, the extension portion and the connection portion are formed from a single sheet metal blank, and thus are rigidly fixed with respect to one another once bent into shape. EX1003, ¶¶261-263; EX1040, 3:55-58; 5:38-44.



EX1040, FIG. 1.

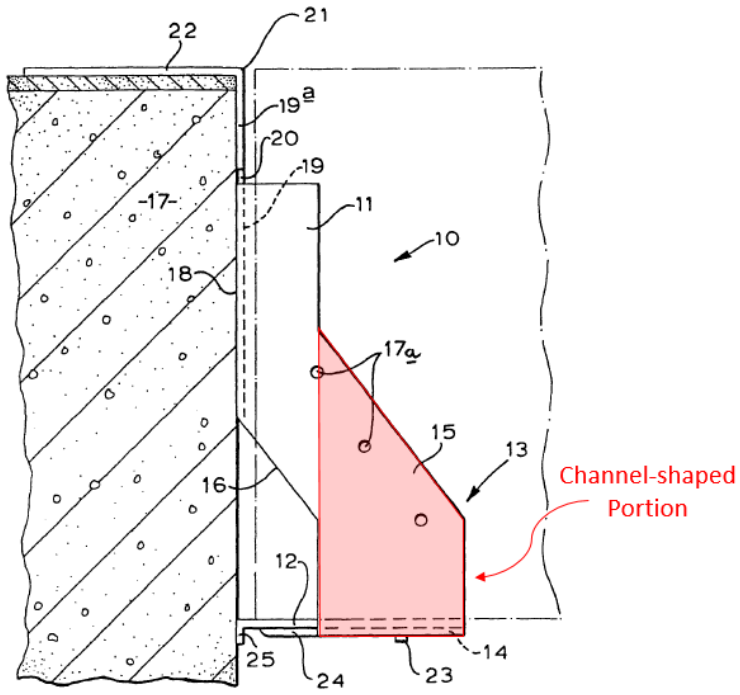
C. Independent Claim 53

[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,"

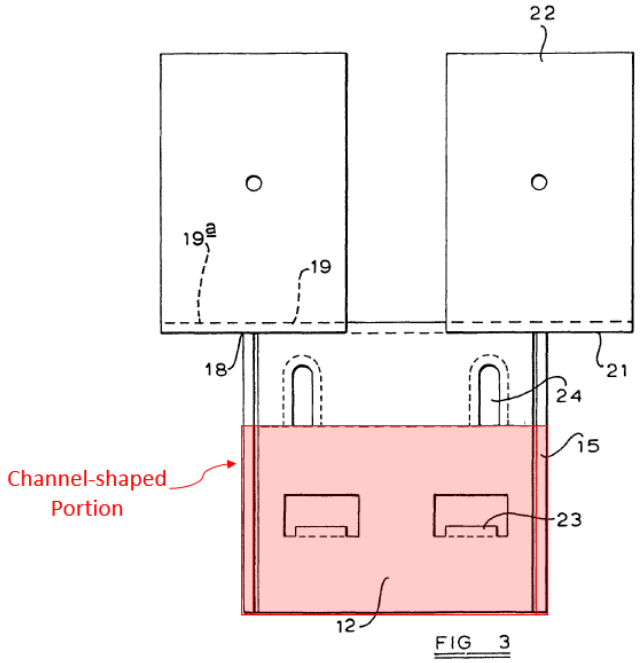
As discussed above for claim 1, element [1.P], Adams-Bundy renders obvious this limitation. EX1003, ¶264.

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

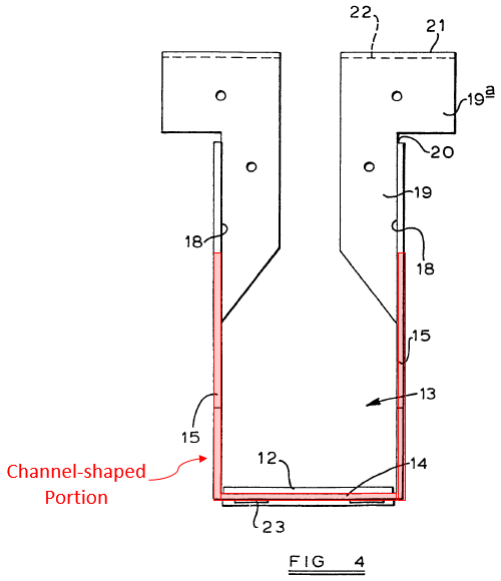
As discussed for claim 1, element [1.1.A], Adams discloses this limitation. EX1003, ¶265; EX1035, 3:23-55, FIGS. 5-7.



EX1040, FIG. 2 (annotated).



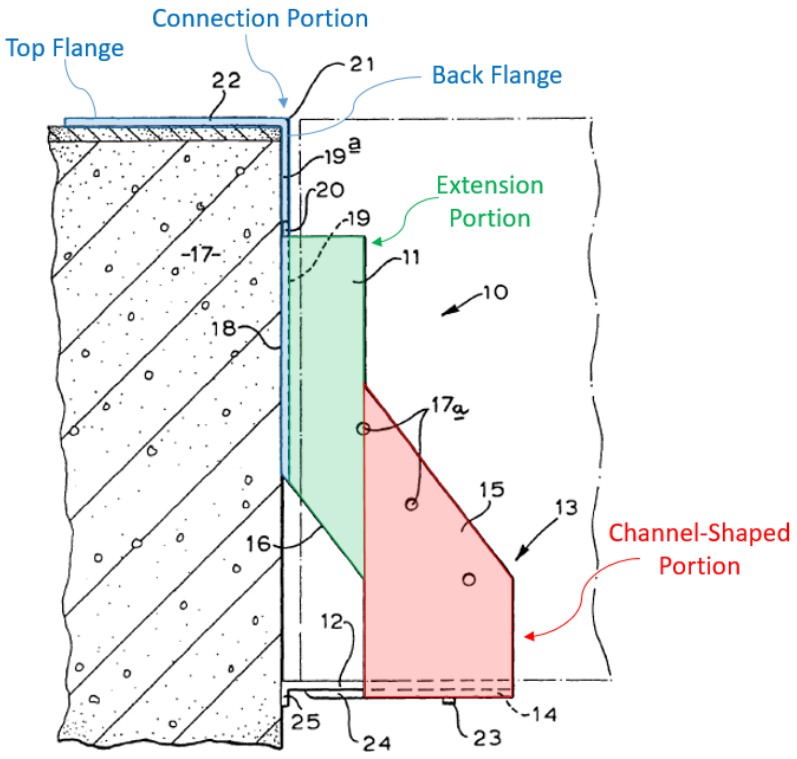
EX1040, FIG. 3.



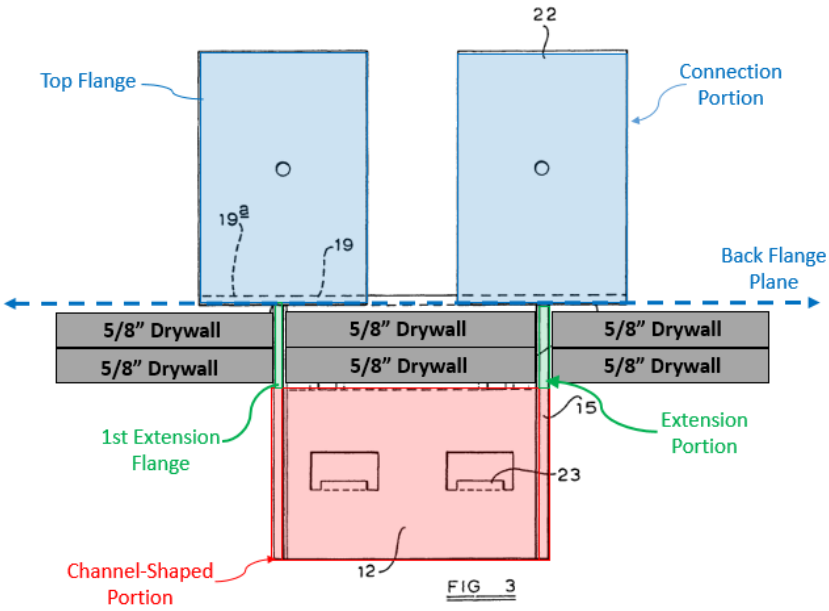
EX1040, FIG. 4 (annotated).

[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;"

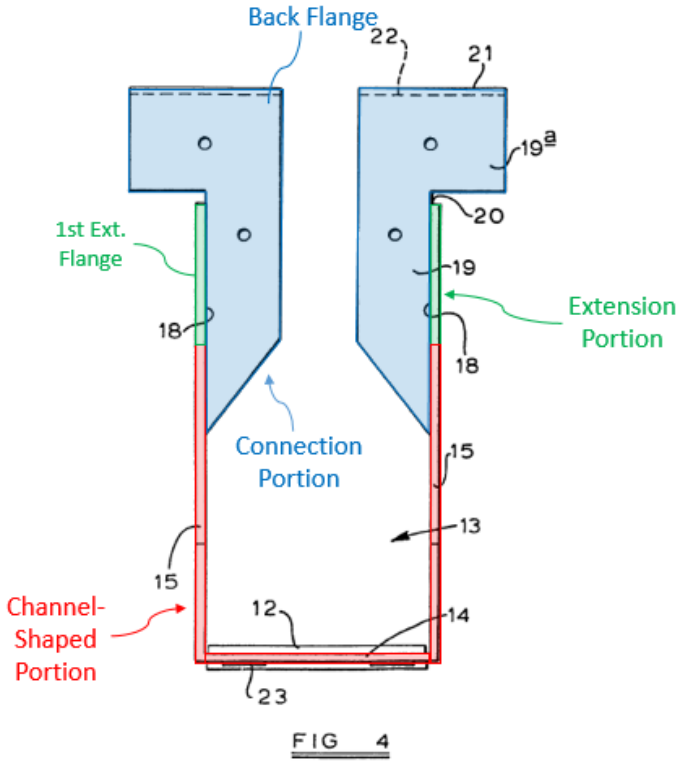
As Adams's extension portion is formed from the same piece of sheet metal as the channel-shaped portion with no intervening components therebetween, Adams's extension portion extends from its channel-shaped portion. EX1003, ¶266; EX1040, 4:11-25. While Adams does not explicitly disclose extending sidewalls 15 through drywall, a POSITA would have been motivated to size Adam's sidewalls so as to receive two layers of 5/8-inch-thick drywall between abutment portion 19 and base 14, as taught by Bundy and discussed above in §VIII.A. EX1003, ¶267; EX1007, 5:18-20. When modified as such, a POSITA would have understood that sidewalls 15 of Adams-Bundy 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, ¶267. Thus, Adams's sidewalls 15 are configured to extend through the two layers of 5/8-inch-thick drywall. EX1003, ¶¶267-268.



EX1040, FIG. 2 (annotated).



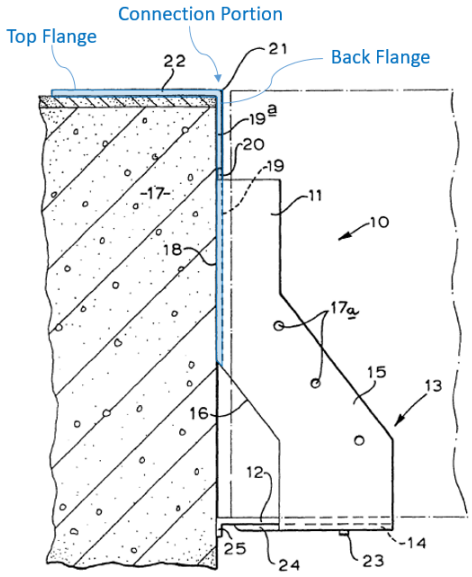
EX1040, FIG. 3 (annotated).



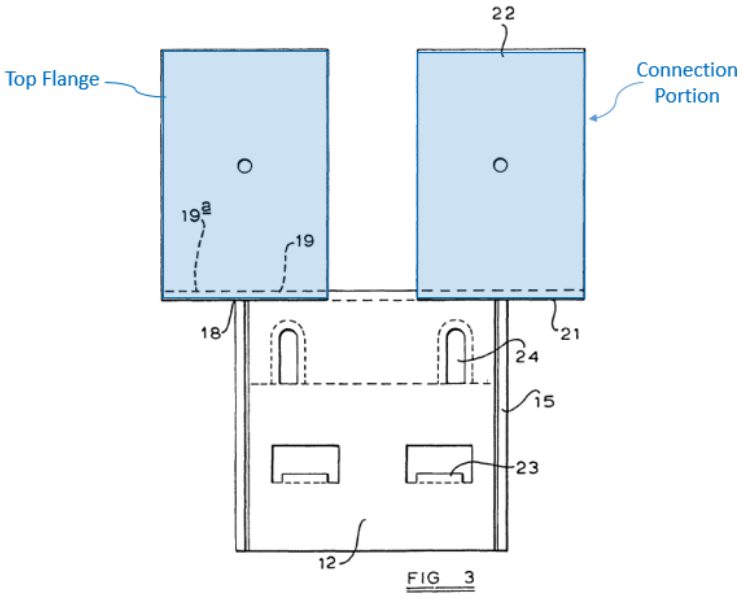
EX1040, FIG. 4 (annotated).

[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,"

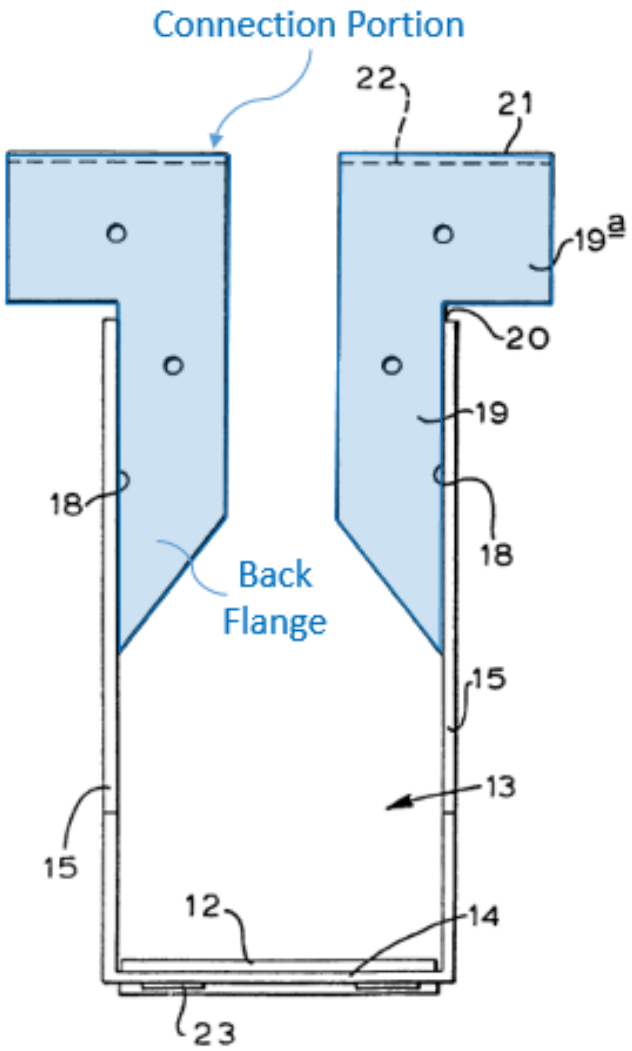
As discussed for claim 1, element [1.2.A], Adams-Bundy discloses this limitation. EX1003, ¶269; EX1035, 3:23-55, FIGS. 5-7.



EX1040, FIG. 2 (annotated).



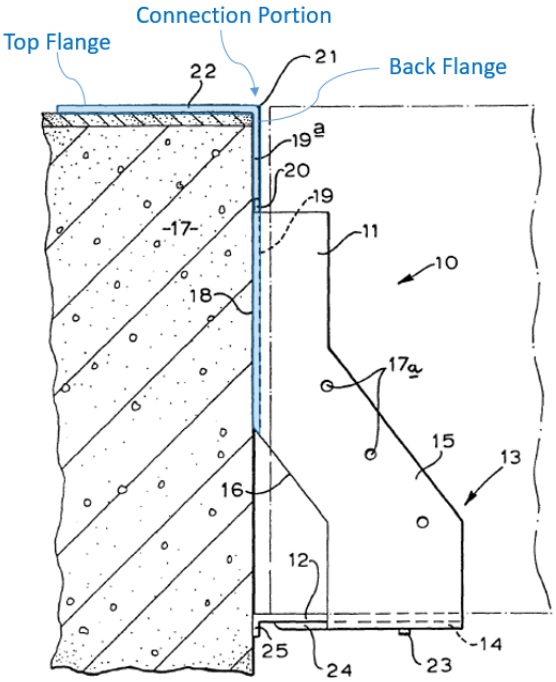
EX1040, FIG. 3 (annotated).



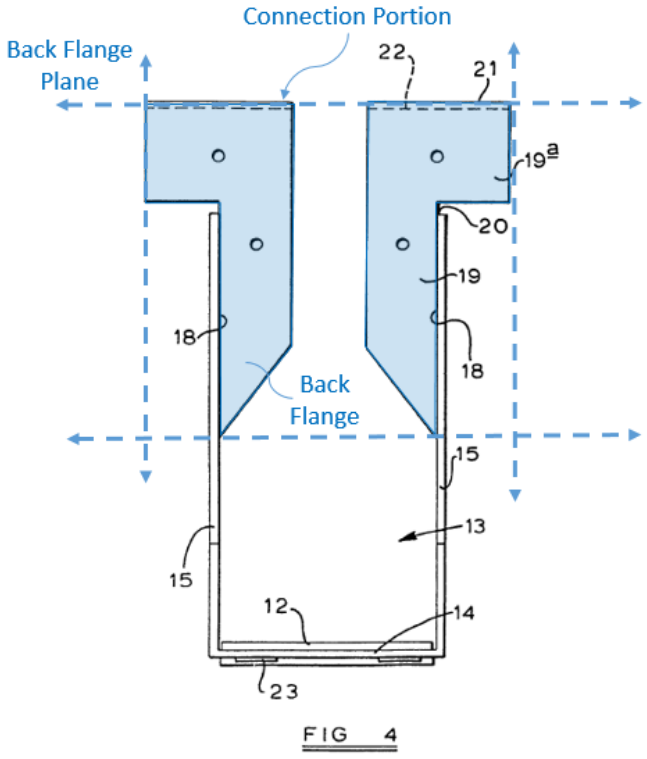
EX1040, FIG. 4 (annotated).

[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 for claim 1, element [1.2.B], Adams-Bundy renders obvious this limitation. EX1003, ¶270.



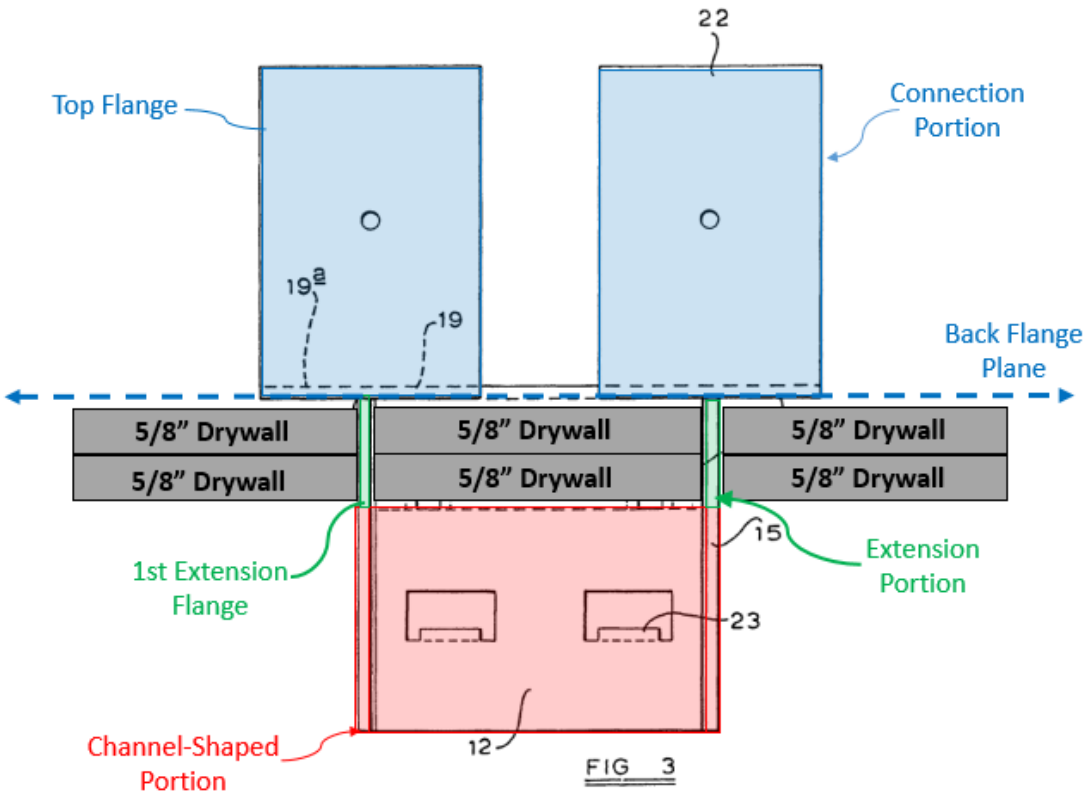
EX1040, FIG. 2 (annotated).



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 for claim 1, element [1.3.B], Adams-Bundy renders obvious this limitation. EX1003, ¶271; 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 for claim 1, element [1.4], Adams discloses this limitation. EX1003, ¶272.

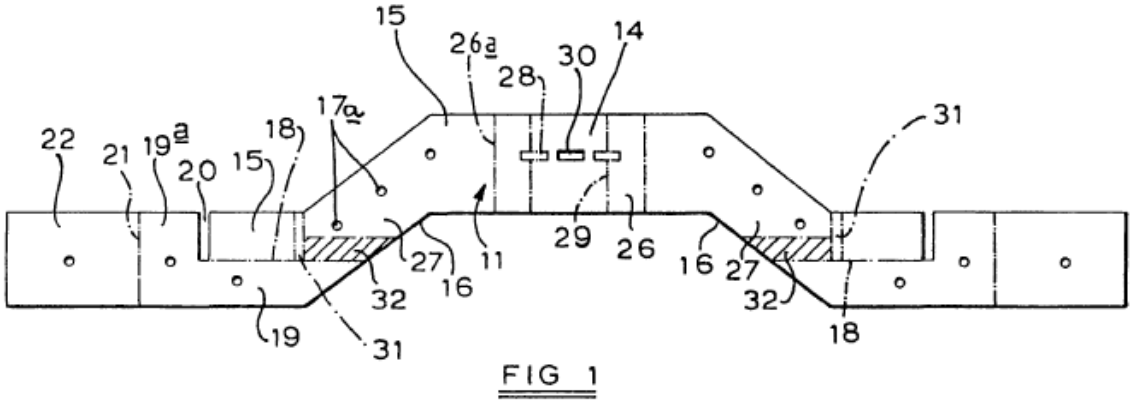
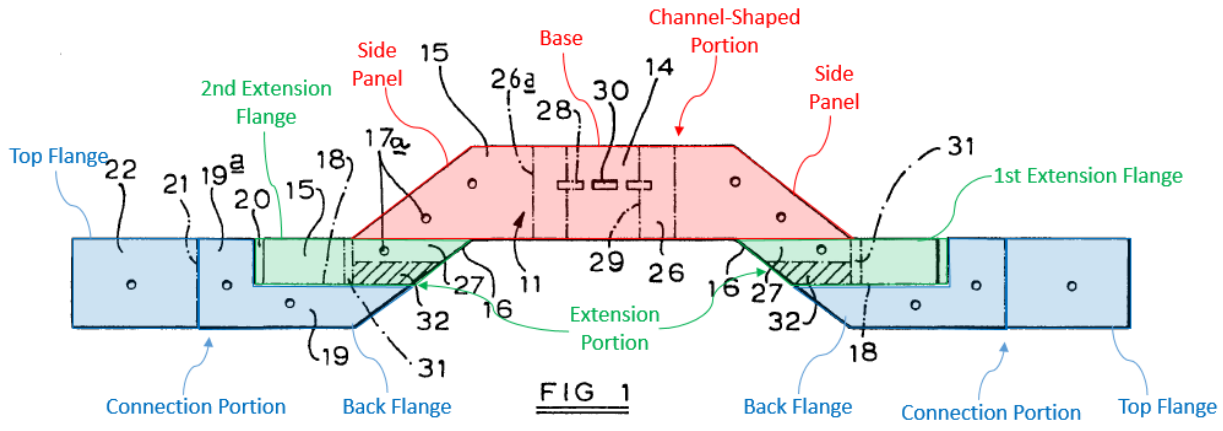


FIG 1

EX1040, FIG. 1.

D. Claims 22-27 and 74-79

Adams discloses forming a joist hanger's extension portion (sidewalls 15 above edge 16), including its first extension flange (first sidewall 15 above edge 16), its channel-shaped portion (base 14 and portions of sidewalls 15 thereabove), and its connection portion (abutment and bearing portions 19, 22) all as one-piece of sheet metal (blank 11). EX1040, 3:55–57, 4:2–6, 4:22–23, 4:34–36, 6:3–22. Adams-Bundy thus renders obvious (1) the hanger's extension portion, including its first extension flange, and the channel-shaped portion being formed as one-piece of sheet metal (claims 22/26/74/78); (2) the extension portion, including its first extension flange, and the connection portion are formed as one-piece of sheet metal (claims 23/75); and (3) the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal (claims 24/27/76/79). EX1003, ¶273.



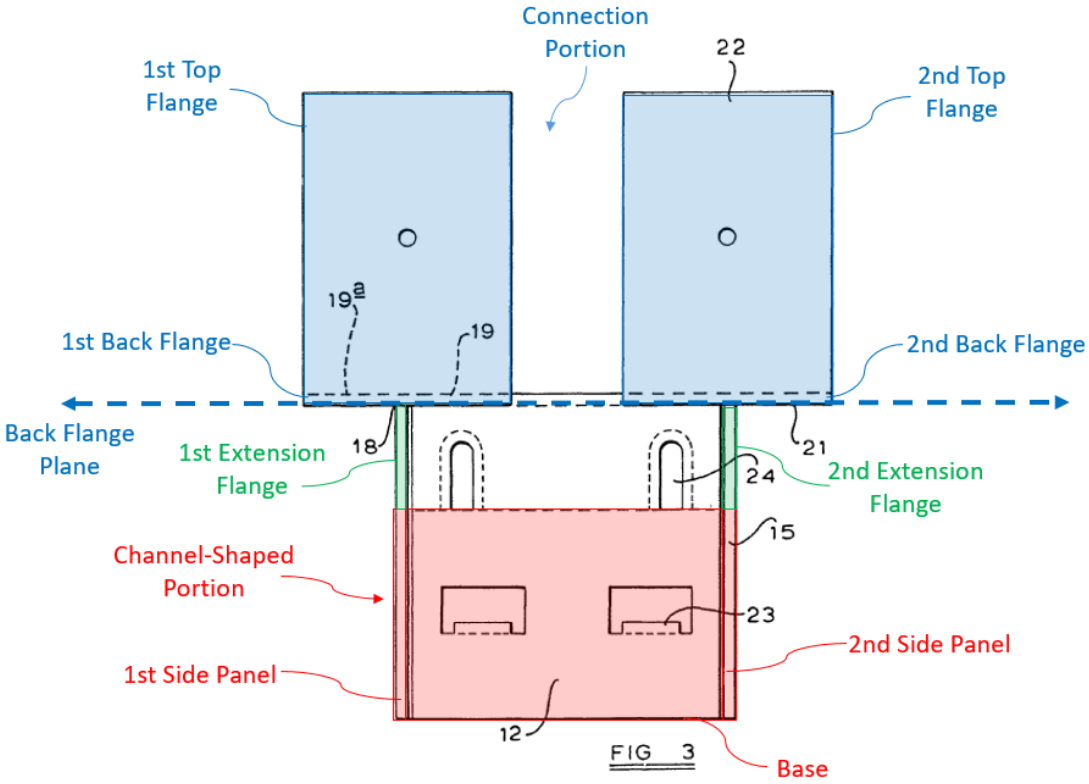
EX1040, FIG. 1 (annotated).

For the same reasons, Adams-Bundy renders obvious the hanger's channel-shaped portion being made of sheet metal, and the extension portion, including its first extension flange, being an extension of the sheet metal forming the channel-shaped portion (claims 25/77). EX1003, ¶¶274-275.

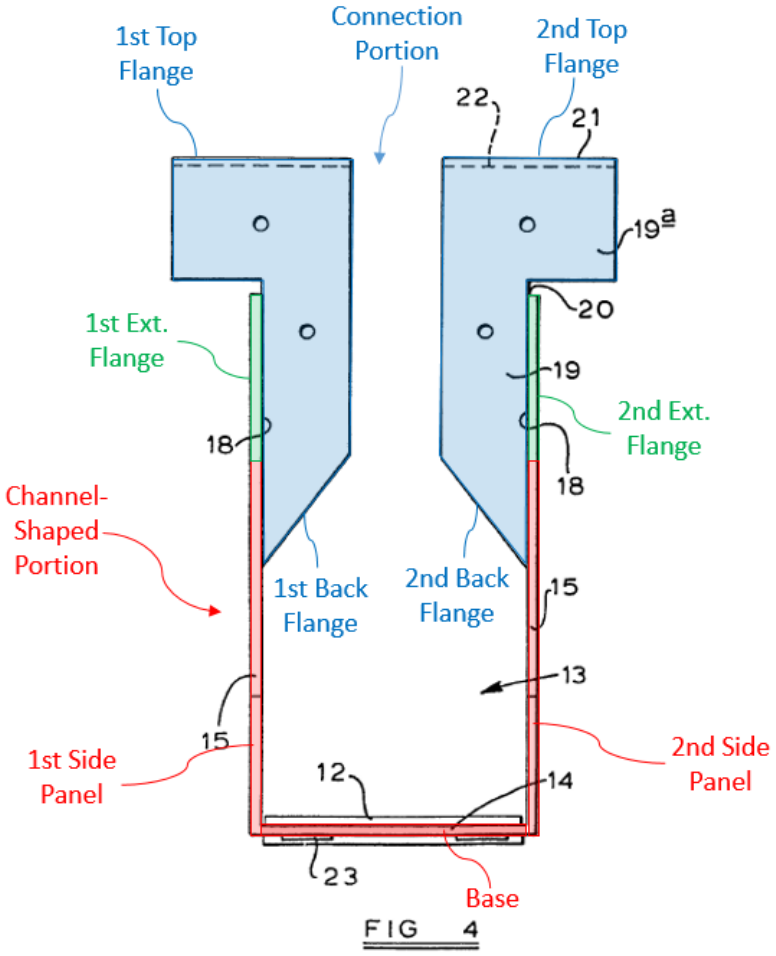
E. Claims 39 and 92

Adams's connection portion includes a first back flange (first abutment portion 19) and a first top flange (first bearing portion 22). EX1040, 4:22–36. Adams's connection portion includes a second top flange (second bearing portion 22) arranged to engage the top surface of the top plate of the frame wall (supporting element 17) and a second back flange (second abutment portion 19) extending from an edge (fold line 21) of the second top flange and arranged to engage the vertical face of the top plate of the frame wall. Being constructed from

sheet metal, Adams's second back flange has a front surface lying in the back flange plane. EX1040, 3:56–58; EX1003, ¶¶276-277.



EX1040, FIG. 3 (annotated).

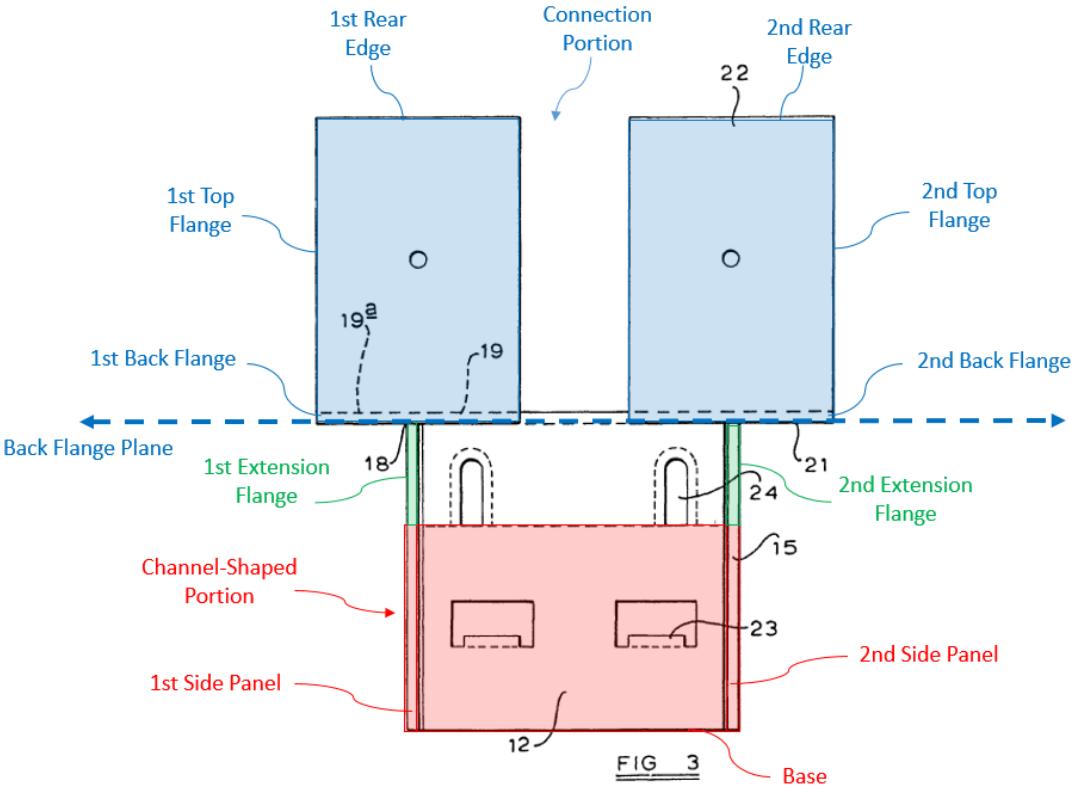


EX1040, FIG. 4 (annotated).

F. Claims 40 and 93

Adams discloses that the first top flange includes a first rear edge (annotated below) located rearwardly of the edge (fold line 21) of the first top flange from which the first back flange extends and that the second top flange includes a second rear edge (annotated below) located rearwardly of the edge (fold line 21) of the second top flange from which the second back flange extends. EX1040, 4:22–37; EX1003, ¶278. Adams discloses the first rear edge (annotated below) being

located rearwardly of the first back flange and the second rear edge (annotated below) being located rearwardly of the second back flange. EX1040, FIGS. 2–4; EX1003, ¶¶278-279.

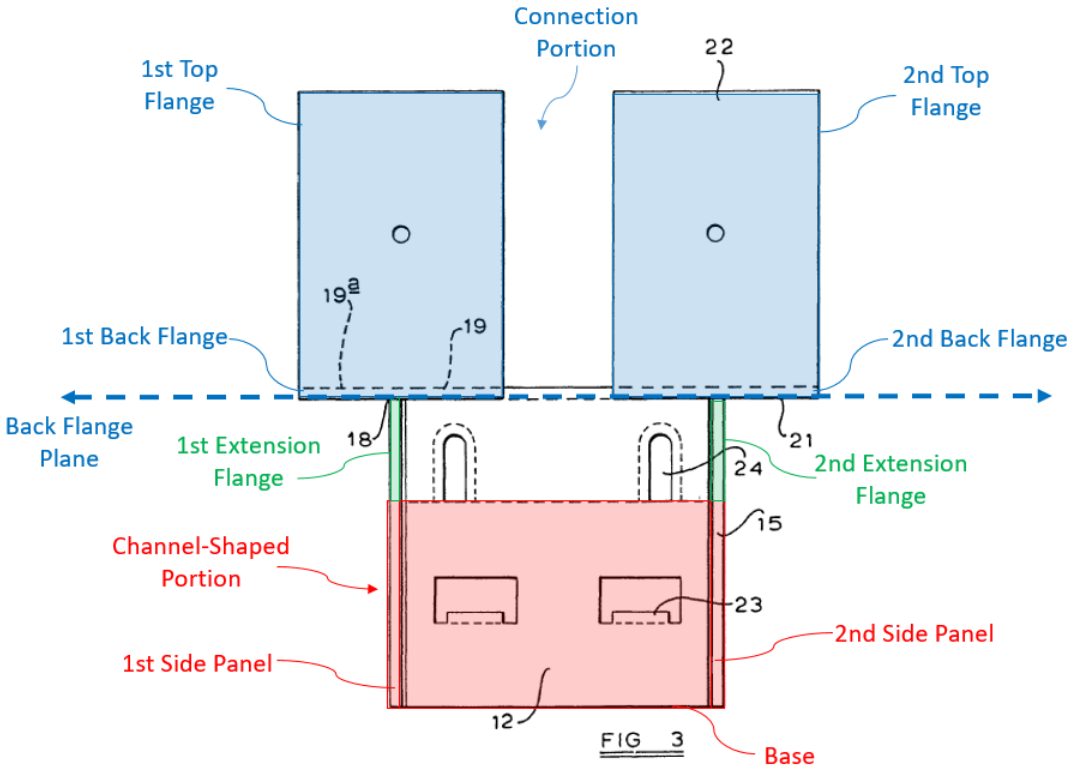


EX1040, FIG. 3 (annotated).

G. Claims 41 and 94

For the reasons discussed for [1.3.A], and given that Adams's sidewalls 15 are symmetrical, Adams discloses that the extension portion includes a first extension flange (first sidewall 15 above edge 16) extending from the channel-shaped portion (base 14 and portion of sidewalls 15 thereabove) to the first back flange of the connection portion (first abutment portion 19) (and vice-versa) and a

second extension flange (second sidewall 15 above edge 16) extending from the second back flange (second abutment portion 19) to the channel-shaped portion (base 14 and portion of sidewalls 15 thereabove) (and vice-versa). EX1040, 4:2–26, EX1003, ¶¶280-281.

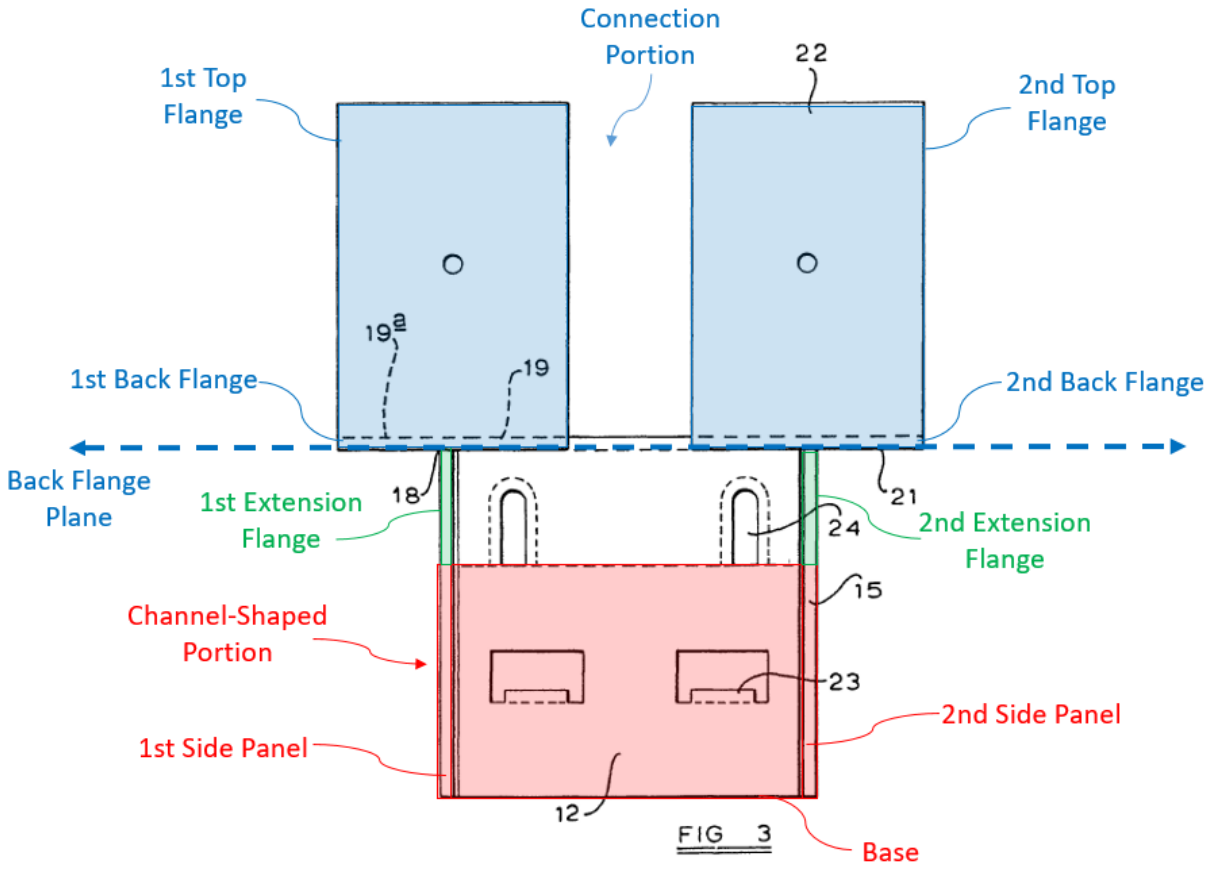


EX1040, FIG. 3 (annotated).

H. Claims 42 and 95

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, ¶¶282-283. Adams further

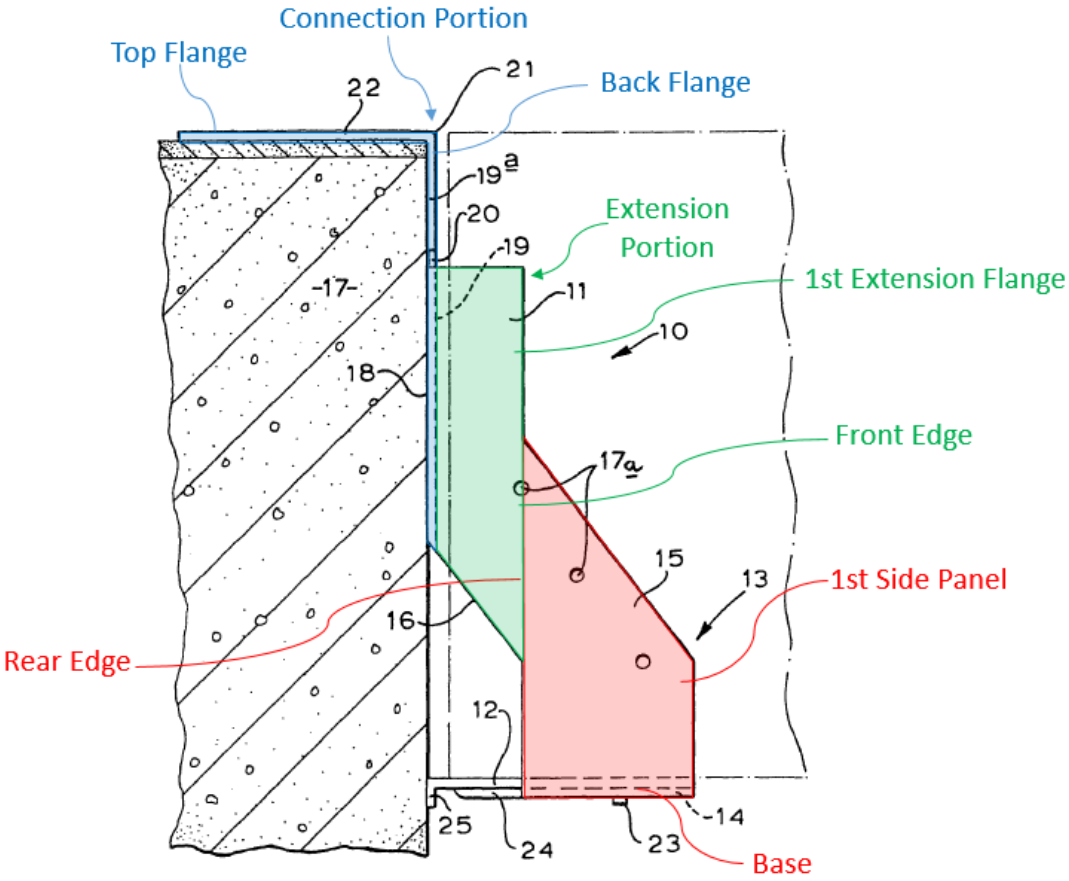
discloses the first and second extension flanges parallel to each other and the first and second side panels parallel to each other, as shown below. EX1040, FIGS 2–4.



EX1040, FIG. 3 (annotated).

I. Claims 43 and 96

Adams discloses that a front edge of the first extension flange abuts a rear edge of the first side panel (sidewall 15 above base 14), as they join with no intervening structures therebetween, shown below. EX1040, FIG. 2; EX1003, ¶¶284-285.



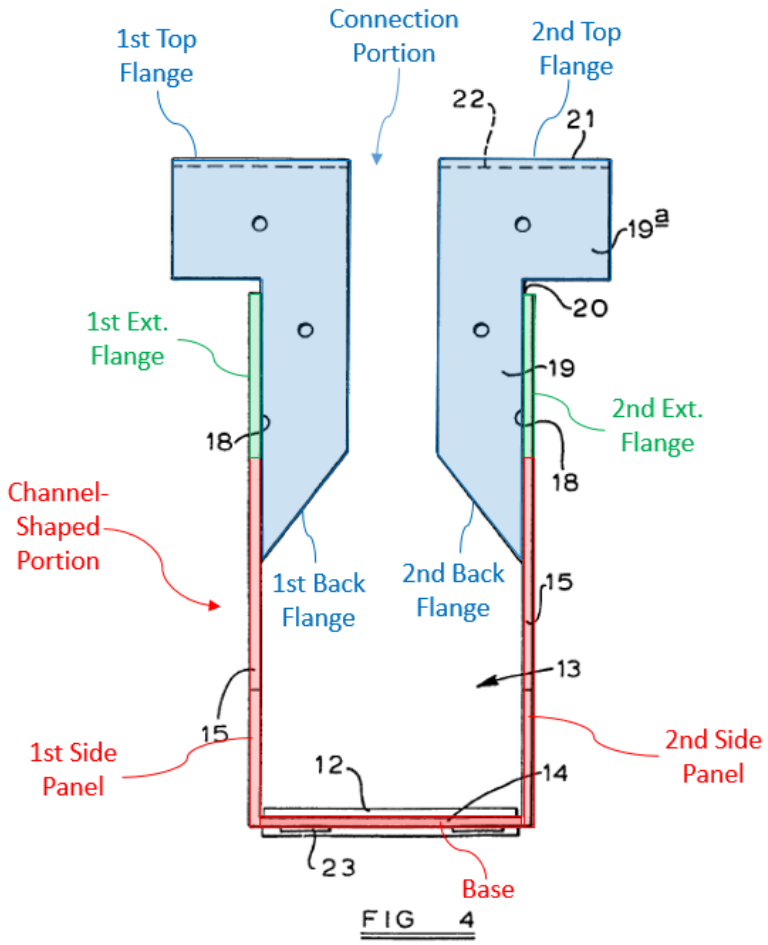
EX1040, FIG. 2 (annotated).

J. Claims 44 and 97

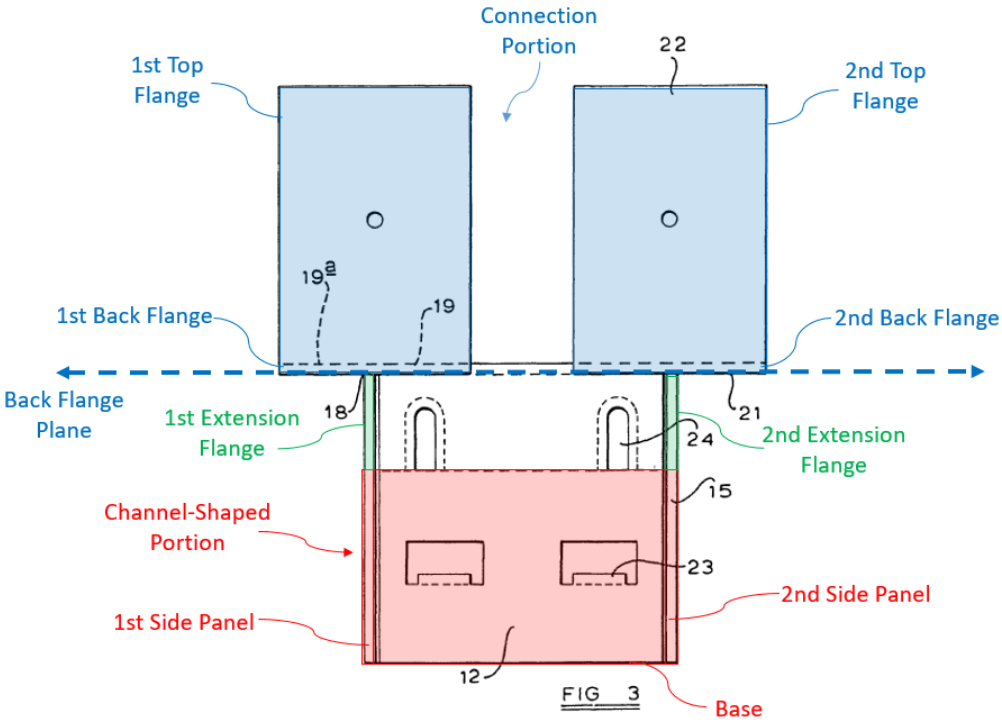
Adams discloses that the first extension flange and the first back flange are directly attached to each other by a first bend (first fold line 18) and that the first back flange and the first top flange are directly attached to each other by a second bend (first fold line 21). EX1040, 4:22–36. Adams discloses that the second extension flange and the second back flange are directly attached to each other by a third bend (second fold line 18) and that the second back flange and the second top

flange are directly attached to each other by a fourth bend (second fold line 21).

EX1040, 4:22-36; EX1003, ¶¶286-287.



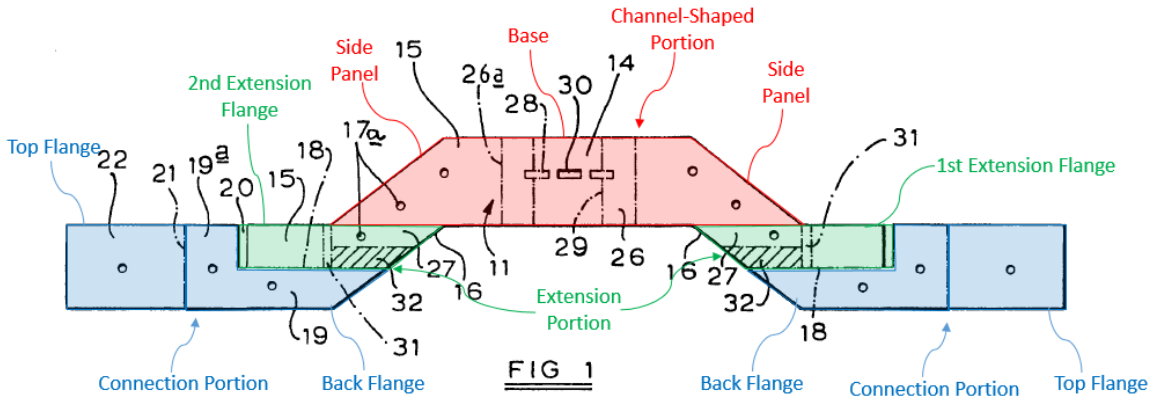
EX1040, FIG. 4 (annotated).



EX1040, FIG. 3 (annotated).

K. Claims 45 and 98

As discussed for claims 24, 27, 76, and 79, Adams discloses that the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal. EX1003, ¶288.



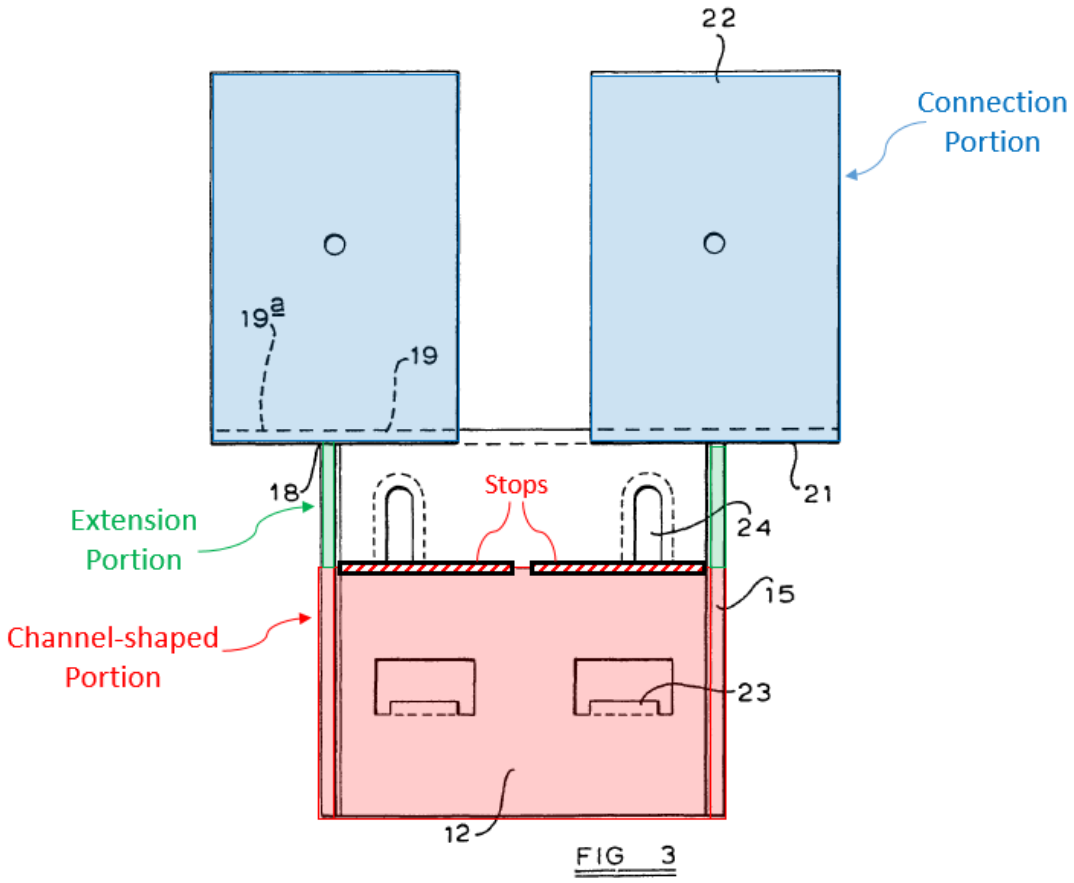
EX1040, FIG. 1 (annotated).

L. Claims 50 and 103

1) Stop Arranged To Engage an End of the Structural Component

Adams does not explicitly disclose a stop configured 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 therebetween. However, as discussed in §VIII.A, Bundy teaches an analogous hanger. Bundy discloses forming a stop at the requisite distance by bending back plate members 9 inward from its side members 11. EX1007, 4:39-46; EX1003, ¶289.

In employing the teachings of Bundy's drywall space with Adams, a POSITA would have been motivated to provide Adams's hanger 10 with a stop to engage the joist's end at the noted distance, as taught by Bundy, so it does not impair drywall installed into the drywall space defined between Adams-Bundy's base and abutment portion. EX1003, ¶290. Such a modification would have been applying a simple substitution of one known element (the sides of Bundy's channel-shaped portion having stops bent inwards to face each other) to another (the sides of Adams's channel-shaped portion) to obtain the predictable result of providing a stop at the joist's end. EX1003, ¶290.



EX1040, FIG. 3 (annotated)

A POSITA would have had a reasonable expectation of success in providing Adams's hanger with a stop to engage and space the joist's end from its back plate 12 by the distance taught by Bundy, because doing so was well within the level of ordinary skill in the art. EX1003, ¶291; EX1007, 4:39-46; EX1008, ¶40. For example, as shown below, a POSITA would have understood to cut a section of Adams's sidewalls 15 above the front of edge 16, and bend the cutout inward at the boundary between the channel-shaped portion and the extension portion to form a stop. EX1003, ¶291.

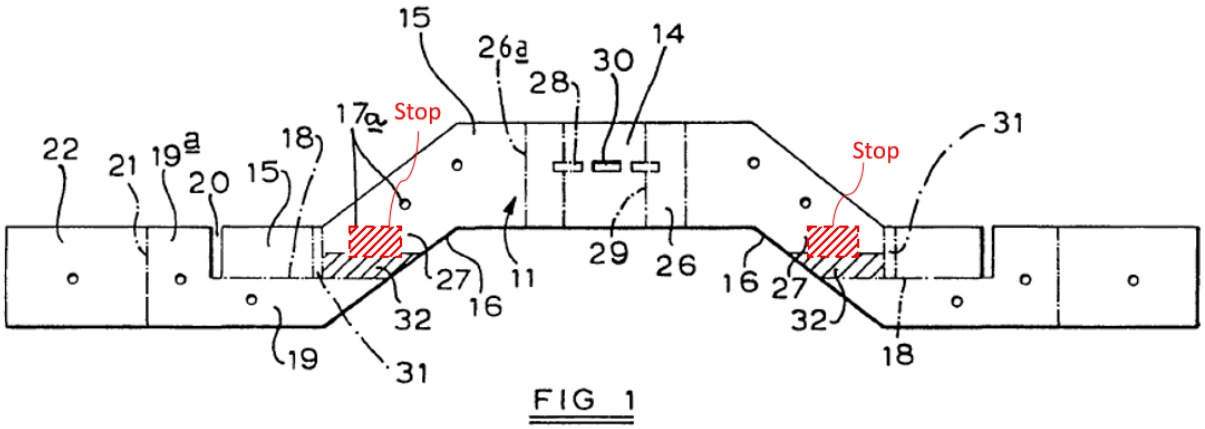


FIG 1

EX1040, FIG. 1 (annotated).

A POSITA would have understood that another option for achieving the stop taught by Bundy would be to configure Adams's metal blank to include an auxiliary section extending from each vertical back edge of the channel-shaped portion, between the base and the front end of edge 16, such that the auxiliary sections are bent inward, perpendicular to the channel-shaped portion, to form a stop. EX1003, ¶292.

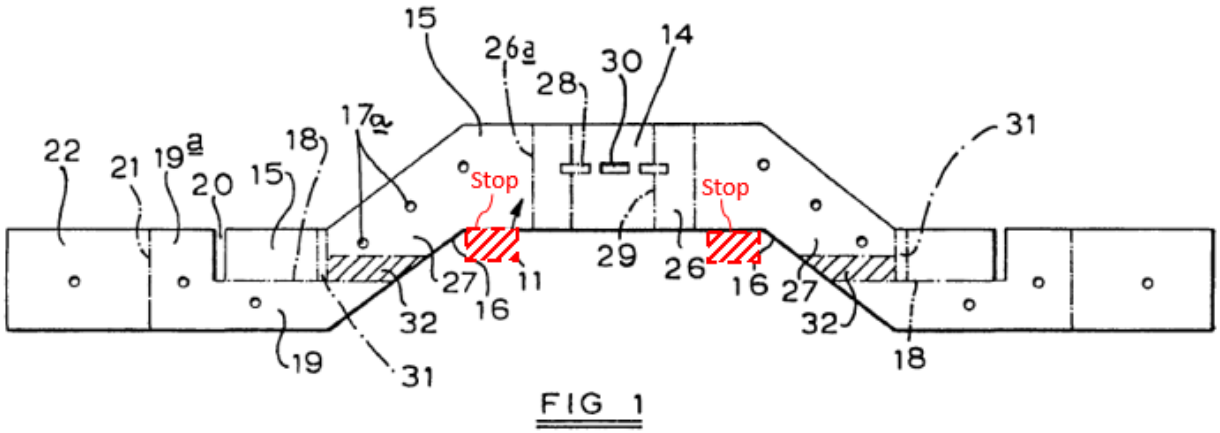
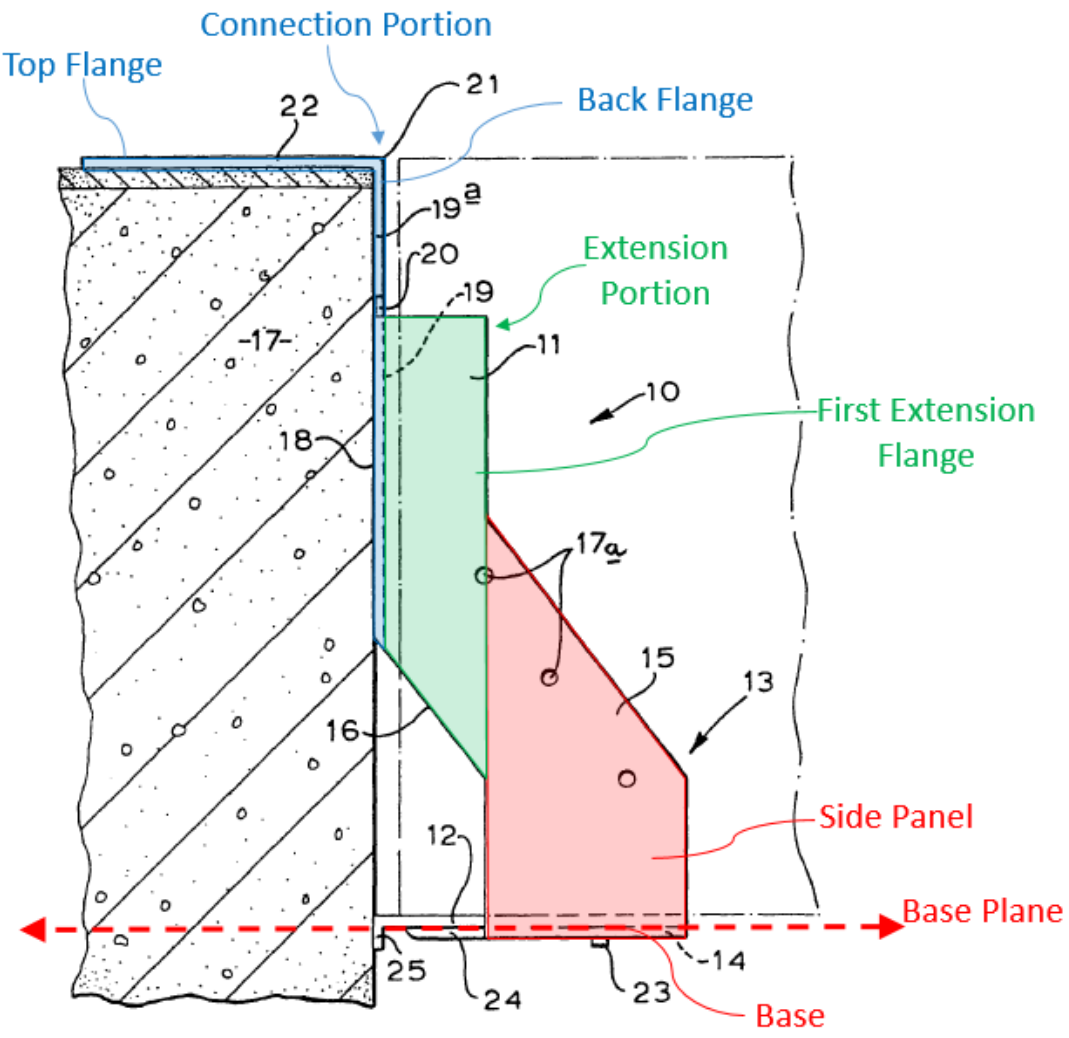


FIG 1

EX1040, FIG. 1 (annotated versions).

2) Base to Receive End Portion of Structural Component

As discussed above for claims 42 and 95, Adams discloses the channel-shaped portion including a base configured to receive and support the structural component's end portion. EX1040, 4:2-5; EX1003, ¶293. Constructed from sheet metal, Adams's base includes an upper surface lying in a horizontal base plane. EX1040, 4:2-5; EX1003, ¶293. 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" and supports a joist thereon. EX1040, 4:2–5. If Patent Owner contends that "engage" requires some measure of direct contact, which Petitioner does not concede, a POSITA would have understood that Adams's shoe plate 12 is "optional" and would have been motivated to remove shoe plate 12 to provide hanger 10 as a single part, thereby using base 14 to directly contact the joist's bottom surface. EX1003, ¶293; EX1040, 4:1–5. A POSITA would have understood that the shoe plate's function of bracing the hanger against the wall would in such cases be provided by other features, such as stronger sheet metal such that additional support is not required, posts on the back edge of base 14 for contacting the wall through which drywall may be inserted, drywall received between base 14 and the wall forming a barrier to counteract moment forces, and the like. EX1003, ¶293.

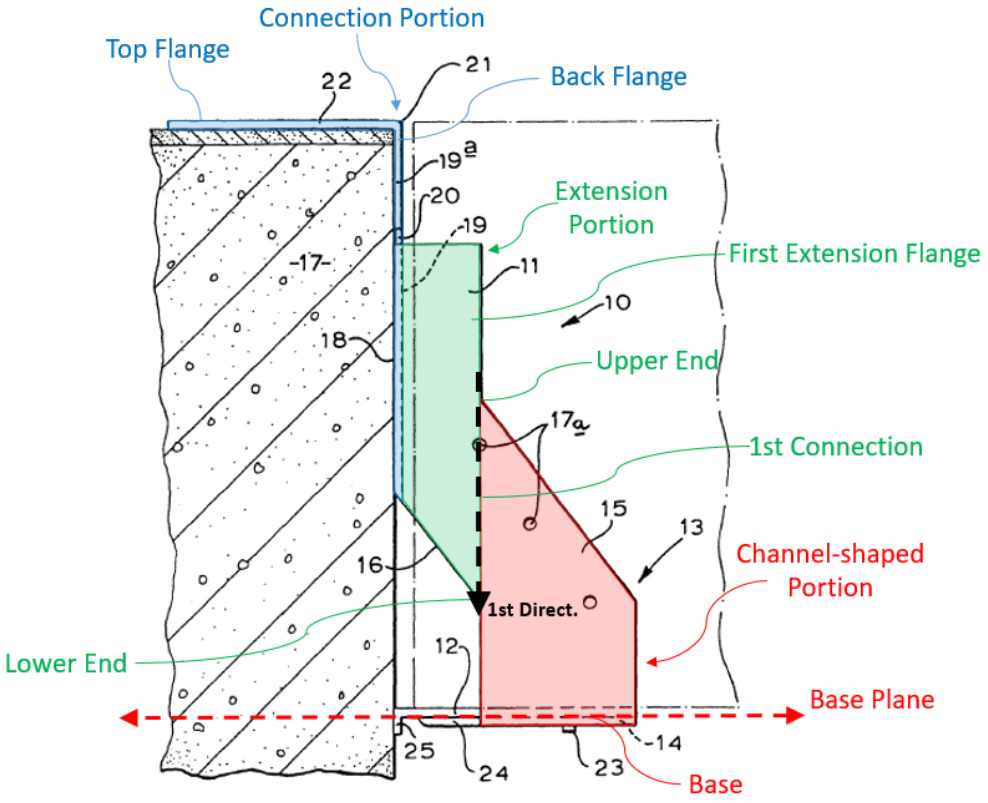


EX1040, FIG. 2 (annotated).

3) First Extension Flange Directly Attached to Channel-Shaped Portion

As discussed regarding claim 1, Adams also discloses that the extension portion includes a first extension flange. Adams further discloses that the first extension flange is directly attached to the channel-shaped portion by a first connection, as shown by the black dashed line between the green and red portions below. EX1040, FIG. 2; EX1003, ¶294. The first connection has an upper end and

a lower end and extends from the upper end to the lower end in a first direction (i.e., vertically) that is perpendicular to the horizontal base plane, shown below. EX1040, FIG. 2; EX1003, ¶¶294-295.

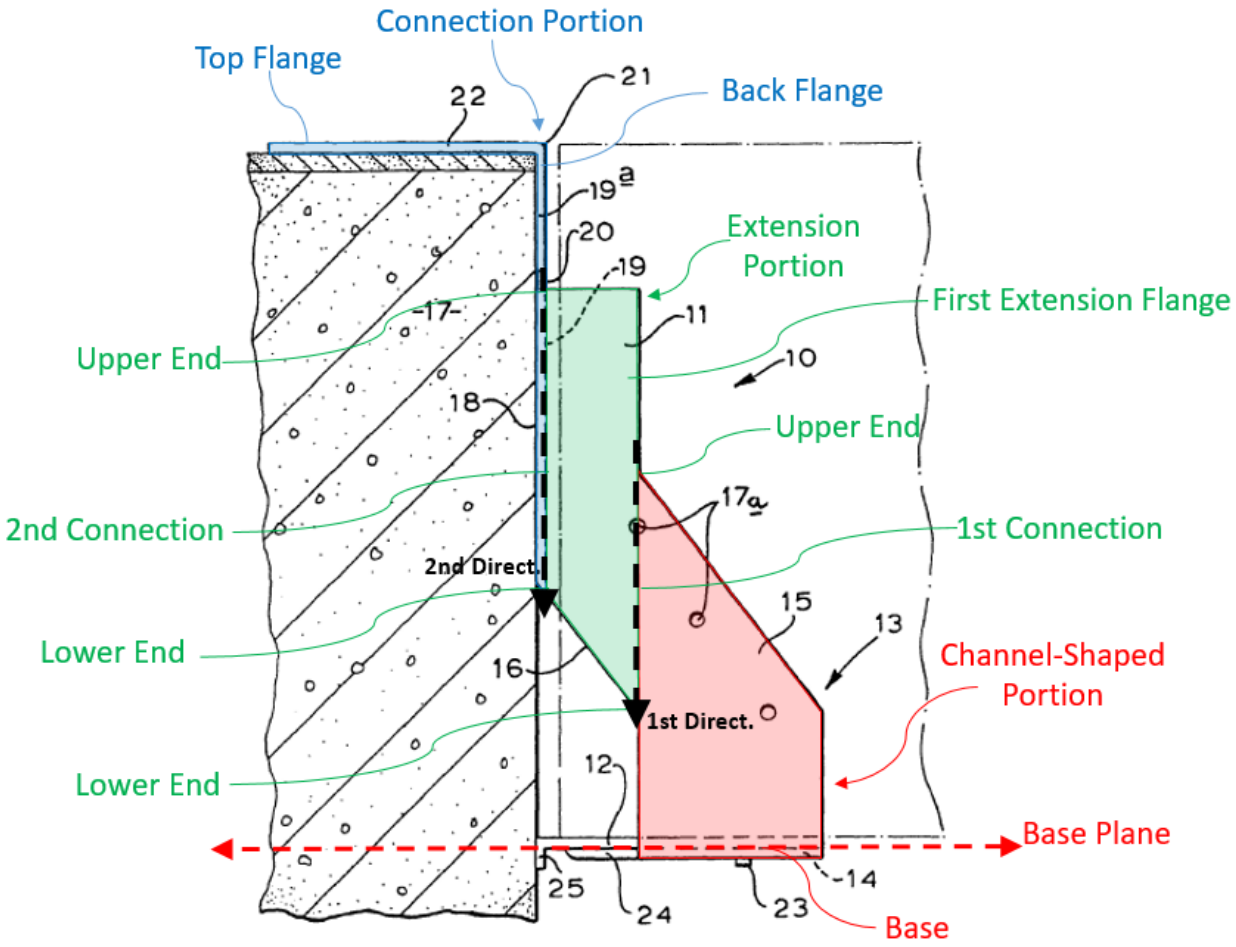


EX1040, FIG. 2 (annotated)

4) First Extension Flange Directly Attached to Connection Portion

Adams discloses that the first extension flange is directly attached to the connection portion by a second connection (fold line 18), shown below. EX1040, 4:22–25, FIGs. 1–2. The second connection has an upper end and a lower end and extends from the upper end to the lower end in a second direction that is parallel to

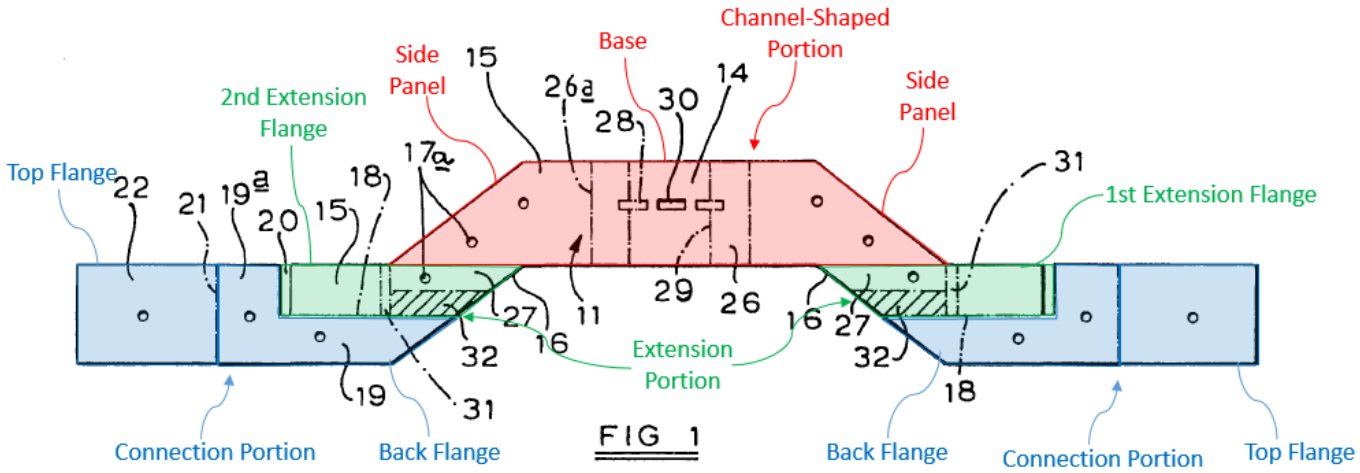
the first direction (i.e., vertical) and perpendicular to the horizontal base plane, shown below. EX1040, FIG. 2; EX1003, ¶295.



EX1040, FIG. 2 (annotated)

5) First Extension Flange and Channel-Shaped Portion as One Piece

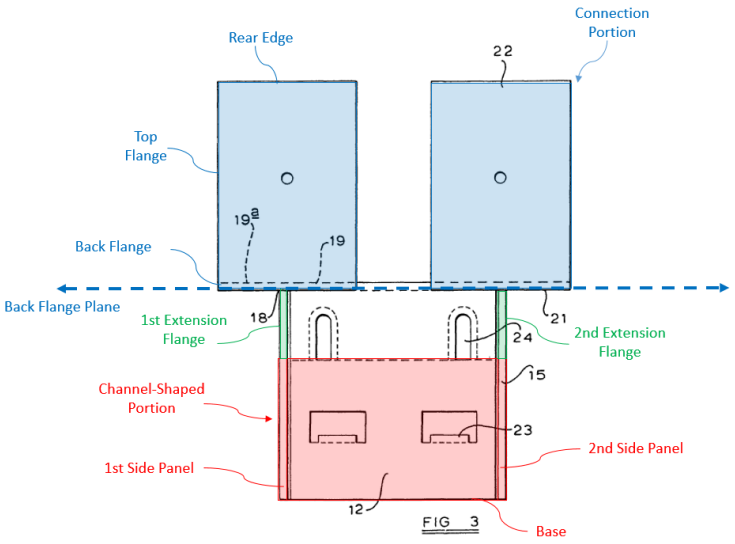
Adams discloses that the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal (blank 11). EX1040, 3:55–57, 4:2–6; EX1003, ¶296.



EX1040, FIG. 1 (annotated).

6) Top Flange's Rear Edge

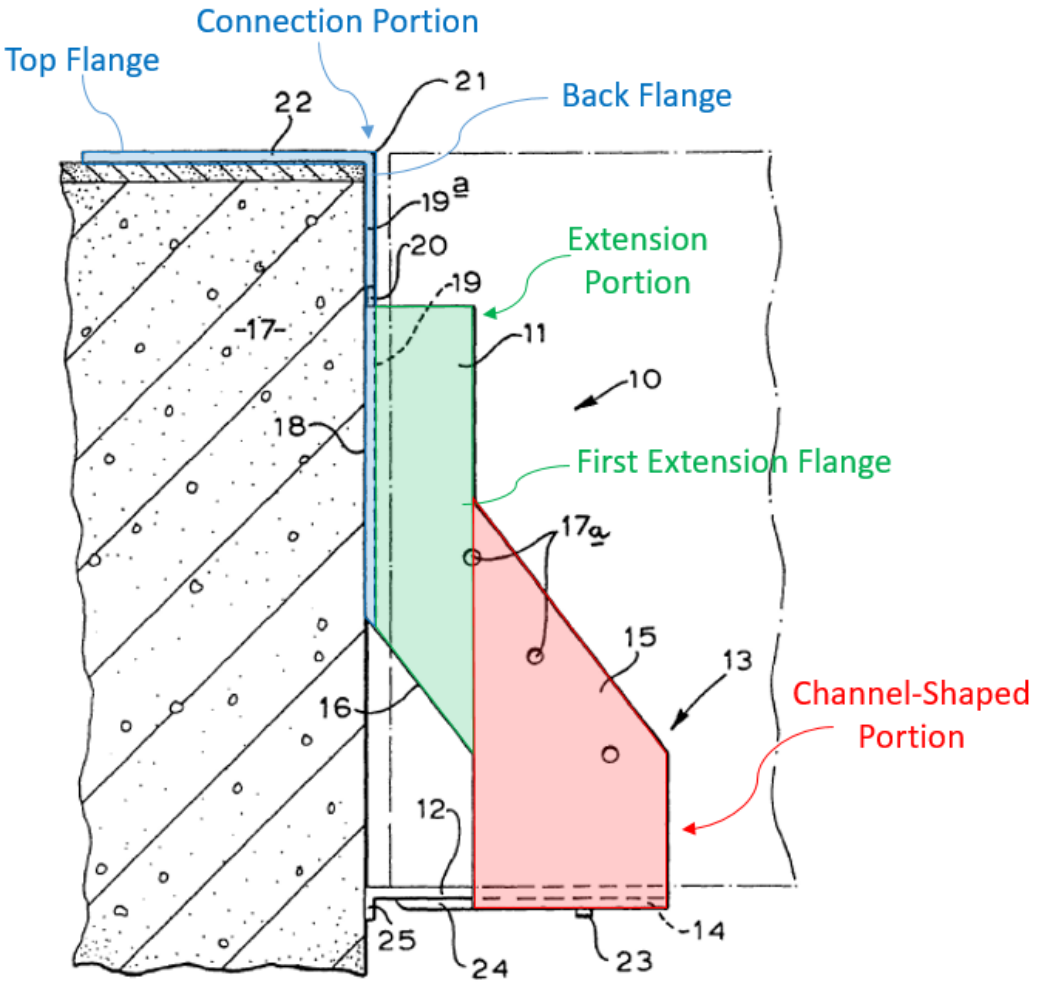
Adams discloses that the top flange includes a rear edge (annotated below) located rearwardly of the edge (fold line 21) of the top flange from which the back flange extends, and that the rear edge is located rearwardly of the back flange, shown below. EX1040, FIG. 3; EX1003, ¶297.



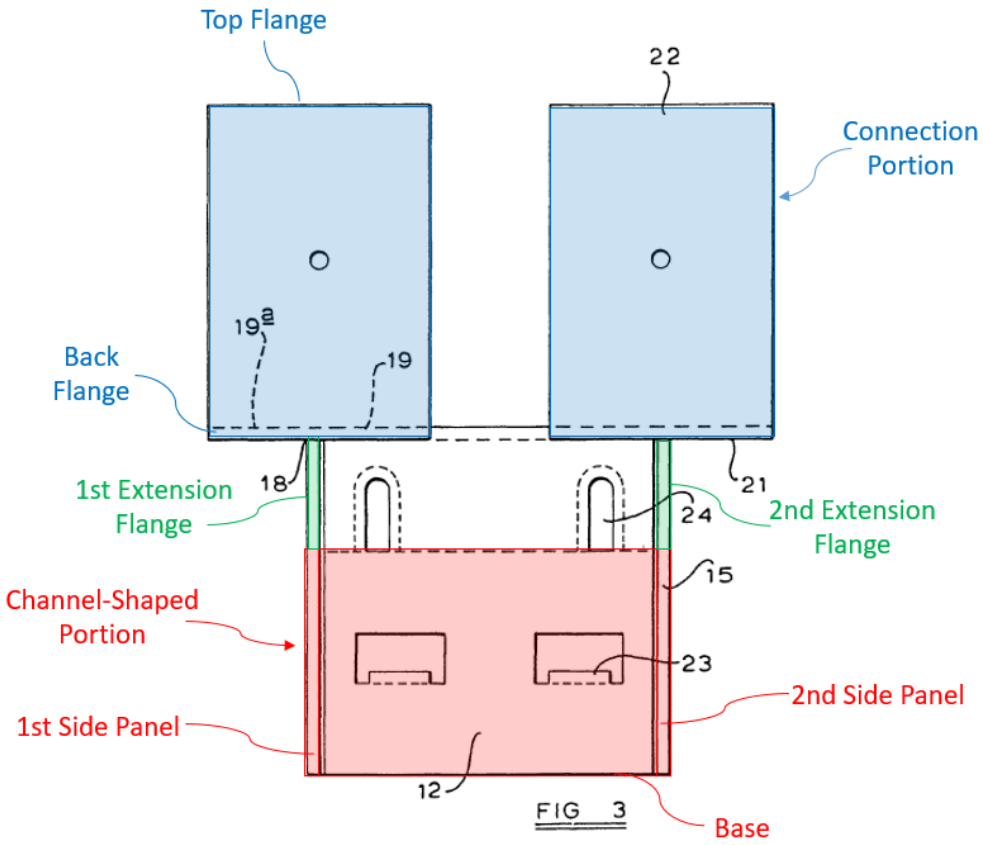
EX10040, FIG. 3 (annotated).

7) Channel-Shaped Portion Spaced Apart From Connection Portion

Adams discloses the channel-shaped portion and the connection portion are spaced apart from one another by the distance defined by the length of the extension portion (sidewalls 15 above edge 16) extending therebetween – long enough to allow two layers of 5/8" drywall to be inserted, as taught by Bundy. EX1040, 4:11–25; EX1003, ¶¶298-299.



EX1040, FIG. 2 (annotated).

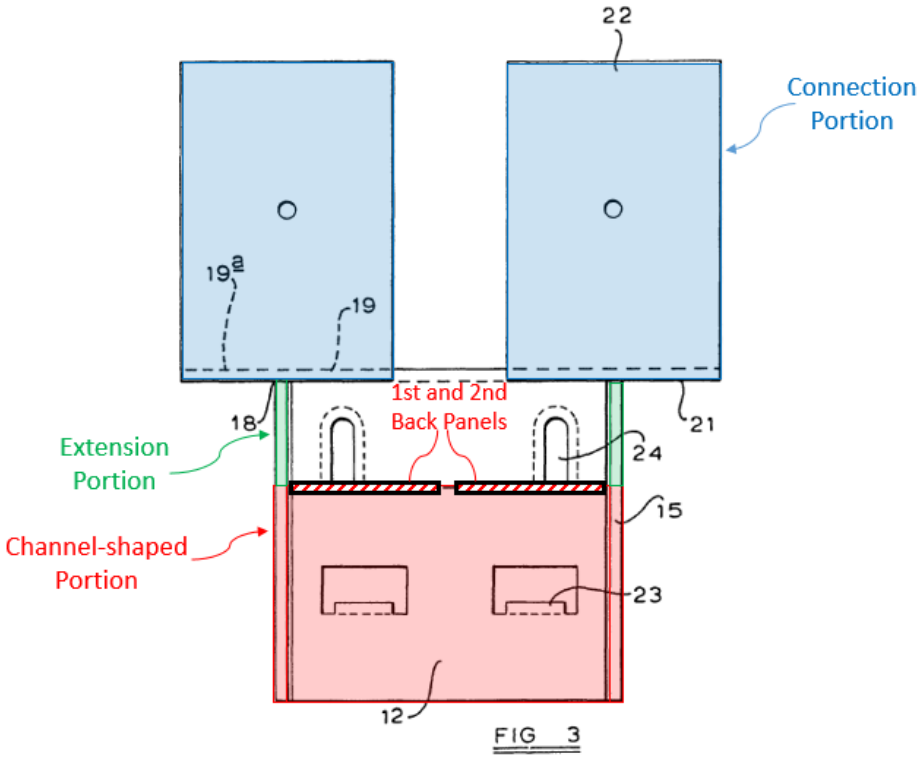


EX1040, FIG. 3 (annotated).

M. Claims 51 and 104

1) Stop Comprising First and Second Back Panels

As discussed for claims 50 and 103, Adams's hanger includes inward-bent back plate members as taught by Bundy that would have resulted in first and second back panels extending toward each other. EX1003, ¶300; EX1007, 4:39-46.

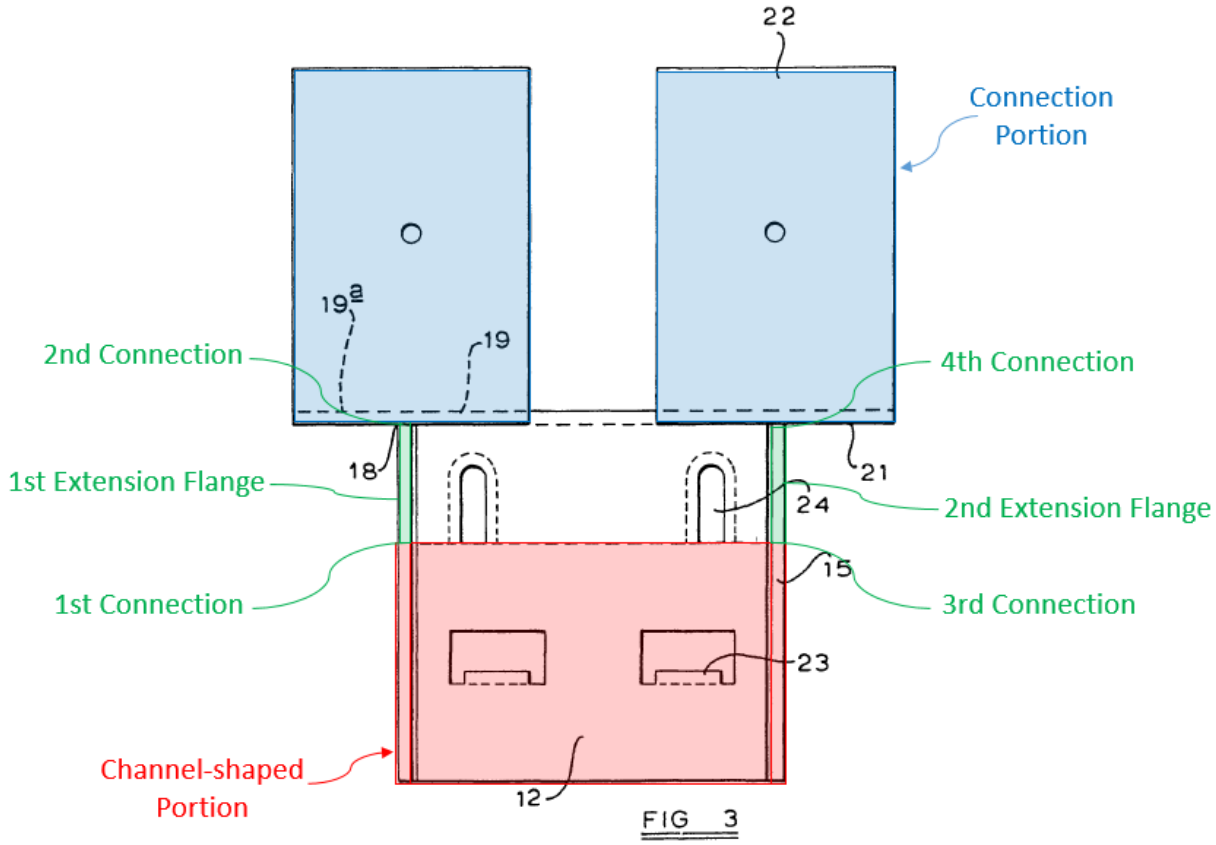


EX1040, FIG. 3 (annotated).

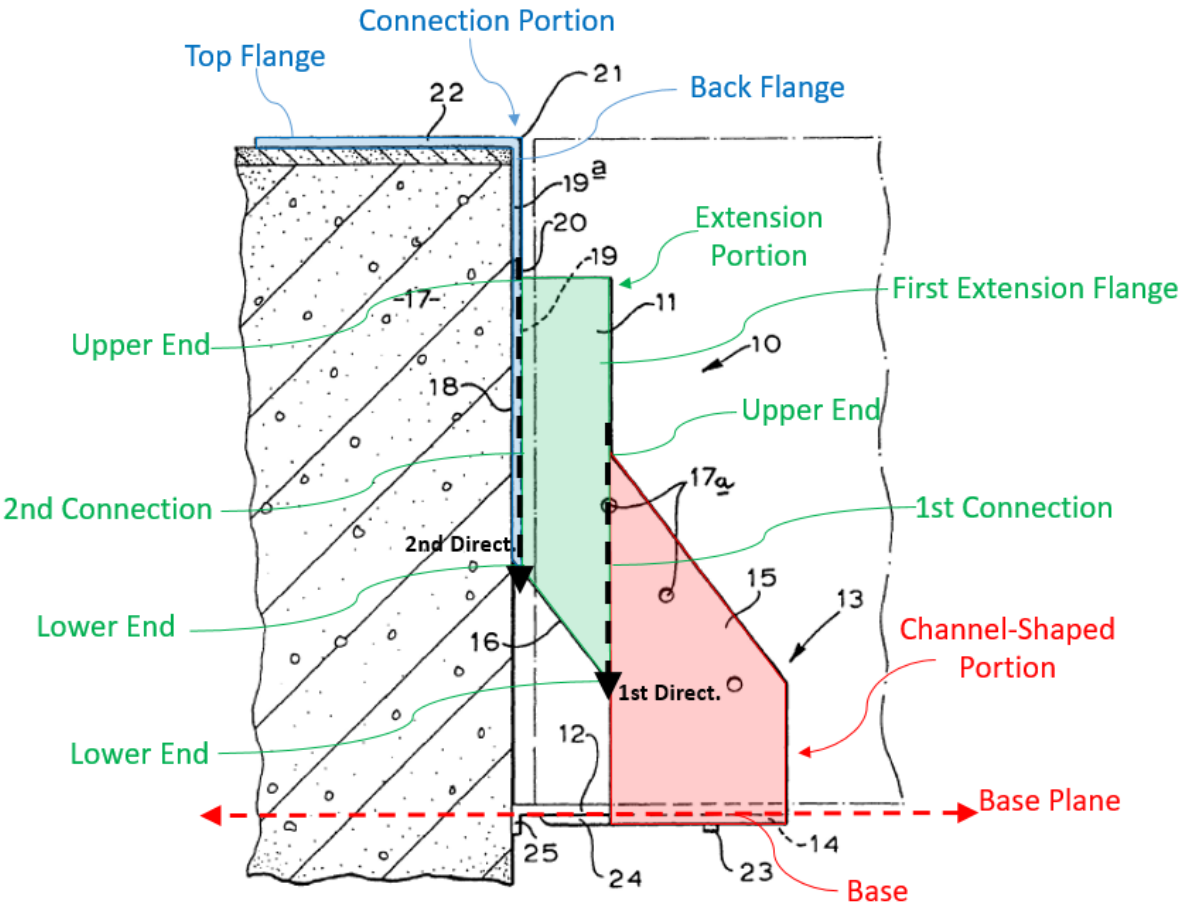
2) Second Extension Flange

Adam's two sidewalls 15 are symmetrical. Thus, for the same reasons provided for claims 41, 50, 94 and 103, Adams discloses that the extension portion includes a second extension flange (second sidewall 15 above second edge 16) extending from the connection portion to the channel-shaped portion (second sidewall 15 above base 14) and being directly attached to the channel-shaped portion by a third connection (front end of edge 16 and upward, shown in yellow below) and directly attached to the connection portion by a fourth connection (fold line 18), shown below. EX1040, 4:22–25, FIGs. 1–2; EX1003, ¶301. The third and fourth connections each have an upper end and a lower end and extend from the

upper end to the lower end in a third direction and fourth direction, respectively, shown below. EX1040, 4:22–25, FIGs. 1–2; EX1003, ¶301. Adams discloses the third and fourth directions being parallel to the first and second directions (i.e., vertical) and being perpendicular to the horizontal base plane, shown below. EX1040, 4:22–25, FIGs. 1–2; EX1003, ¶301.



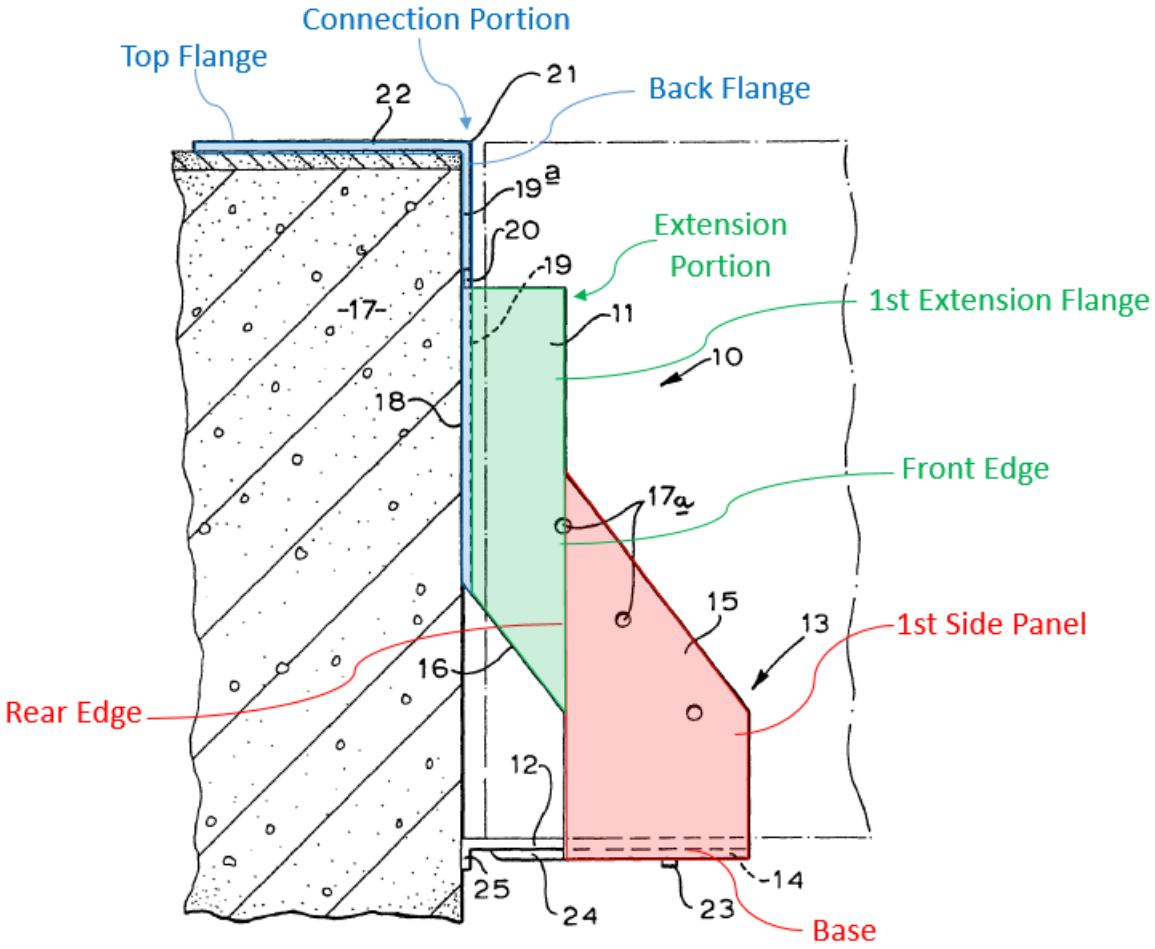
EX1040, FIG. 3 (annotated).



EX1040, FIG. 2 (annotated).

3) First Side Panel

As discussed for claims 42 and 95, Adams discloses a channel-shaped portion including a first side panel (first sidewall 15 above base 14) extending upward from the base. EX1040, 4:2-5; EX1003, ¶302. Adams discloses a front edge of the first extension flange (sidewall 15 above edge 16) abutting a rear edge of the first side panel (sidewall 15 above base 14). EX1040, FIG. 2.

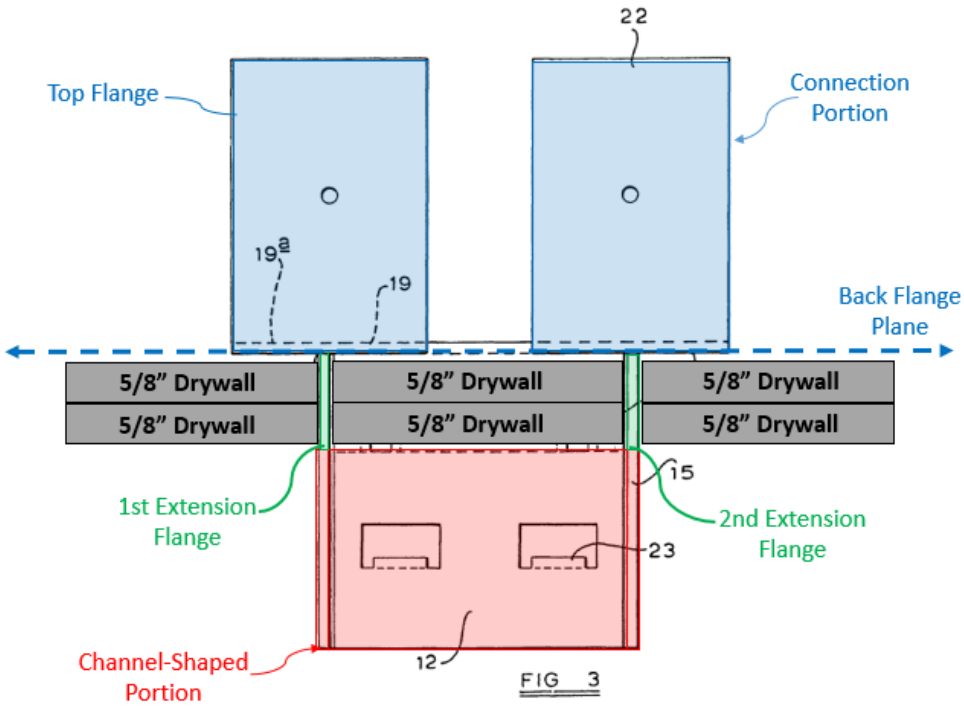


EX1040, FIG. 2 (annotated).

4) Drywall Space

As discussed in §VII.A, Adams-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. For the reasons discussed for claims 1 and 53 and as illustrated below, a POSITA would have sought to modify the length of Adams's sidewalls 15 to a size sufficient to receive such drywall between Adams's base 14 and abutment portion 19 as taught by Bundy. Adams-Bundy's channel-shaped portion,

first and second extension flanges, and back flange (whose front surface defines the back flange plane) define the drywall space's size and shape, and thus bound the drywall space. EX1040, FIGS. 1, 3; EX1007, 5:10-22; EX1003, ¶¶303-304.



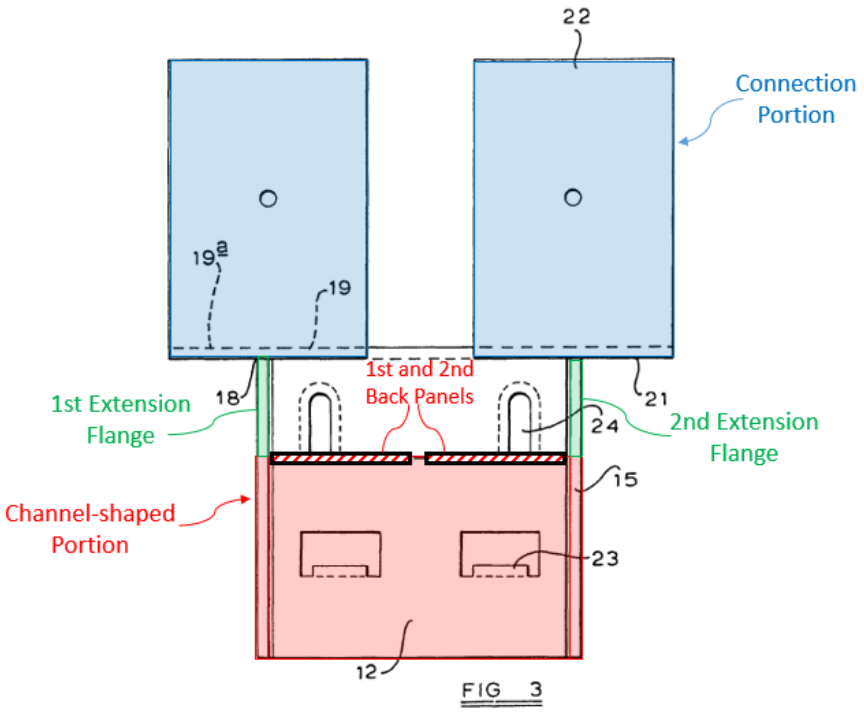
EX1040, FIG. 3 (annotated).

N. Claims 52 and 105

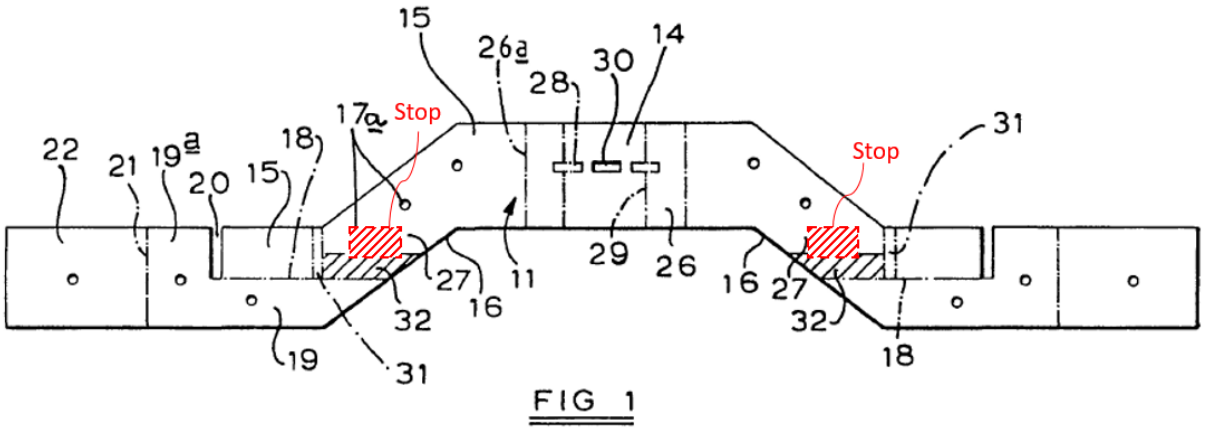
1) First and Second Back Panels Directly Attached to First and Second Extension Flanges

Given the teachings of Bundy's inward-bent back plate members 9 with Adams's hanger, a POSITA would have been motivated to directly attach, via bending, one of Bundy's inward-bent back panels to Adams's first extension flange (first sidewall 15) and the other of Bundy's inward-bent back panels to

Adams's second extension flange (second sidewall 15). EX1003, ¶305. Bundy teaches bending back plate members 9 at the rear edge of its channel-shaped portion. EX1007, 4:42–44. A POSITA would have understood that punching out and bending a section of Adams's sidewalls 15 above the front end of edge 16 would provide the benefits of the back panels using the least amount of sheet metal. When such a bending of the sidewalls is implemented in Adams at a location that would be in front of any inserted drywall, as taught by Bundy, such bends would also directly attach to the extension flanges at the top and bottom corners of the respective bent sections, given the location of Adams's sidewalls vis-à-vis its extension flanges. EX1003, ¶305. Thus, Adams-Bundy renders obvious the first back panel directly attached to the first extension flange and the second back panel directly attached to the second extension flange. *Id.*



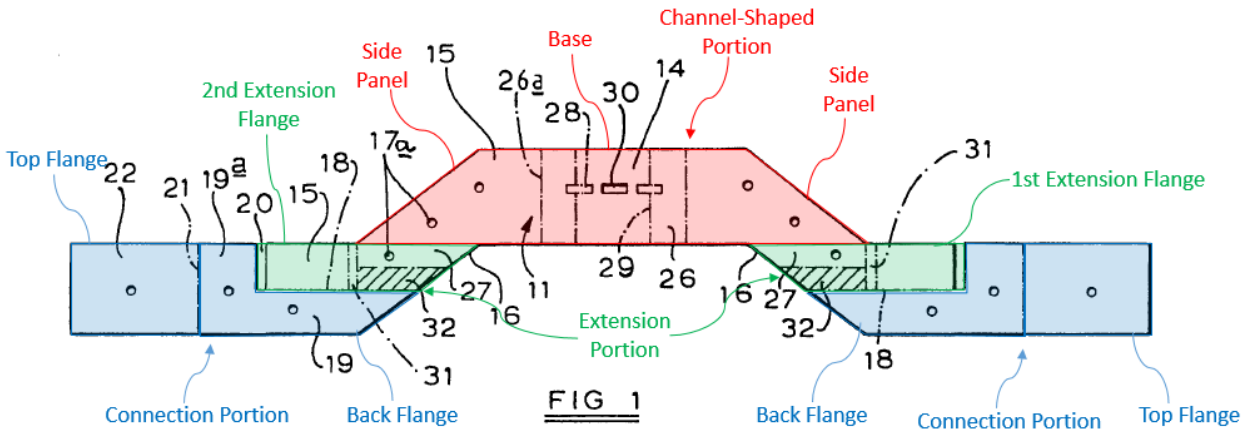
EX1040, FIG. 3 (annotated).



EX1040, FIG. 1 (annotated).

2) One-piece of Sheet Metal

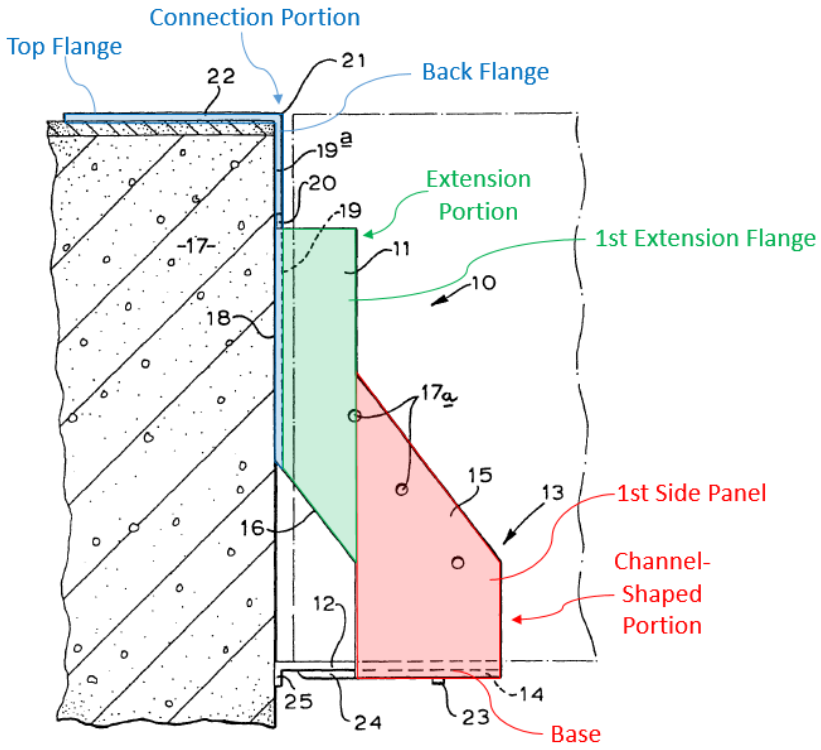
As discussed for claims 45 and 98, Adams discloses the channel-shaped portion, the connection portion, and the extension portion being formed as one-piece of sheet metal. EX1040, 3:55–57, 4:2–6, 4:22–23, 4:34–36; EX1003, ¶306.



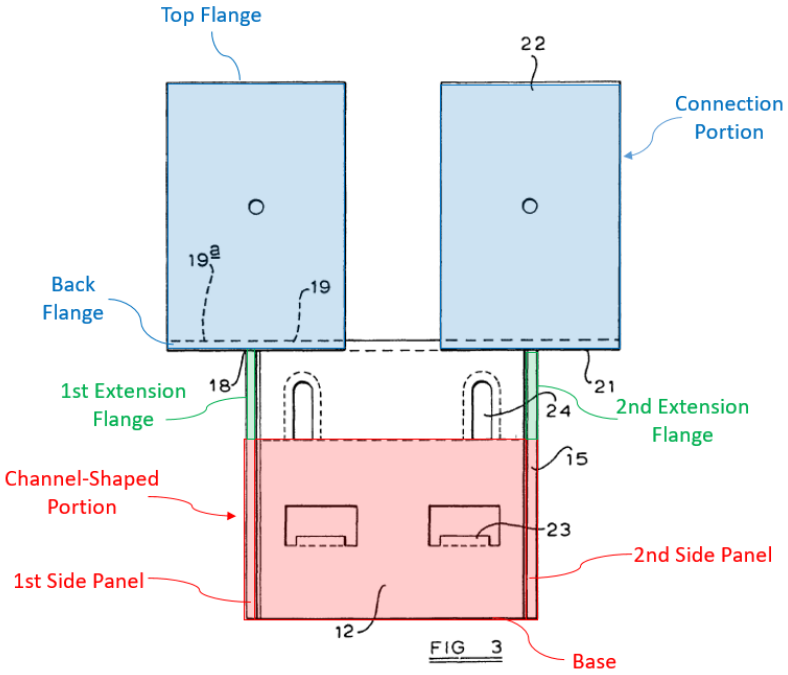
EX1040, FIG. 1 (annotated).

3) Second Side Panel

As discussed for claims 42 and 95, Adams-Bundy discloses a second side panel extending upward from the base, wherein the first and second extension flanges are parallel to each other and the first and second side panels are parallel to each other. EX1003, ¶307.



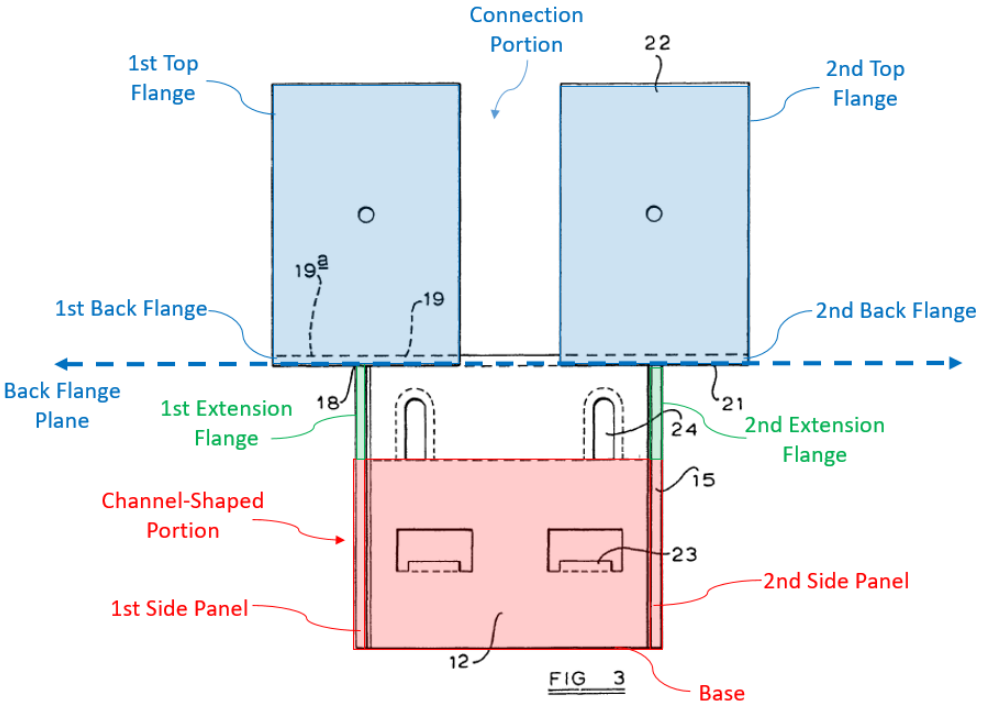
EX1040, FIG. 2 (annotated).



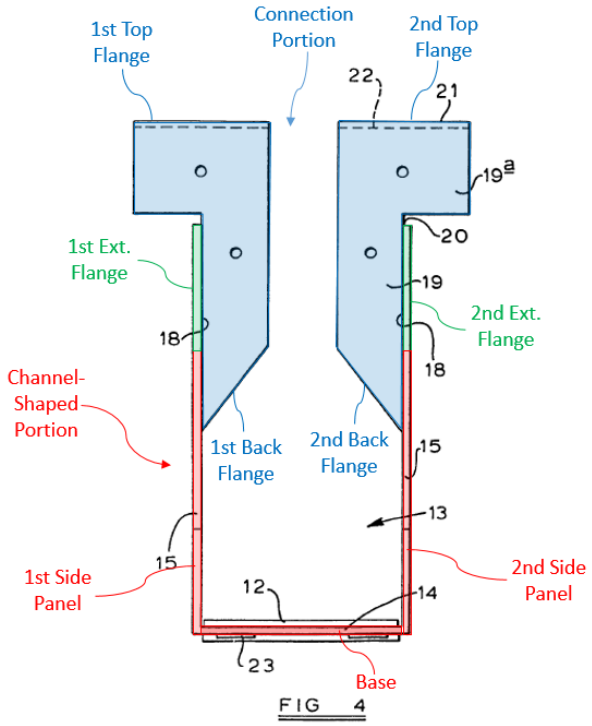
EX1040, FIG. 3 (annotated).

4) First Back and Top Flanges

For the reasons discussed for claims 39 and 92, Adams discloses that the back flange is a first back flange and the top flange is a first top flange. EX1040, 4:22–36; EX1003, ¶3808.



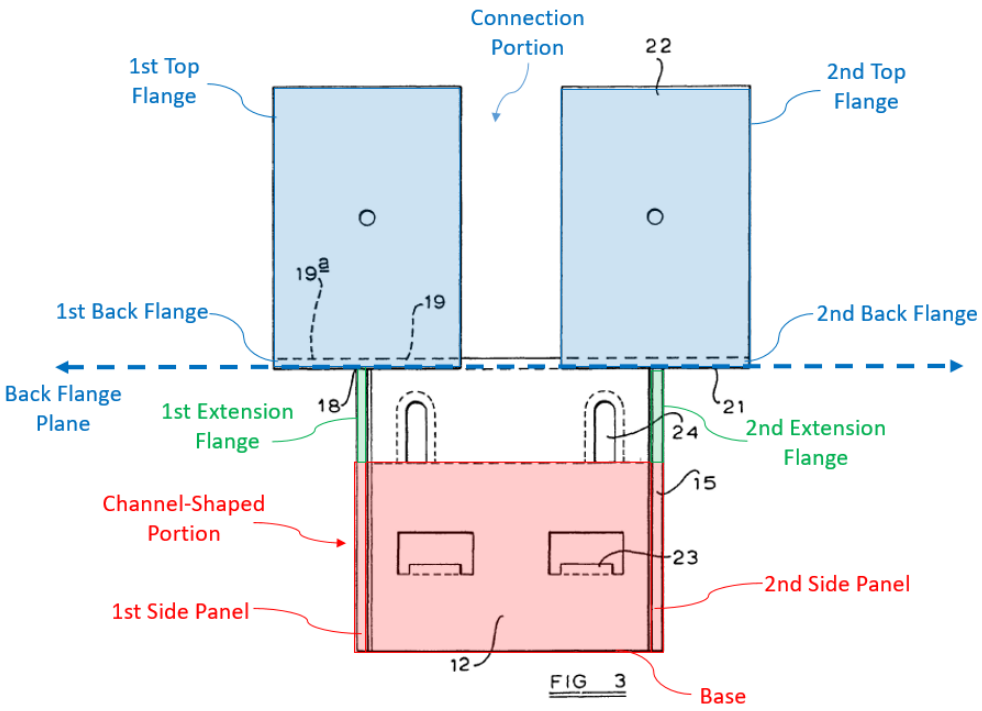
EX1040, FIG. 3 (annotated).



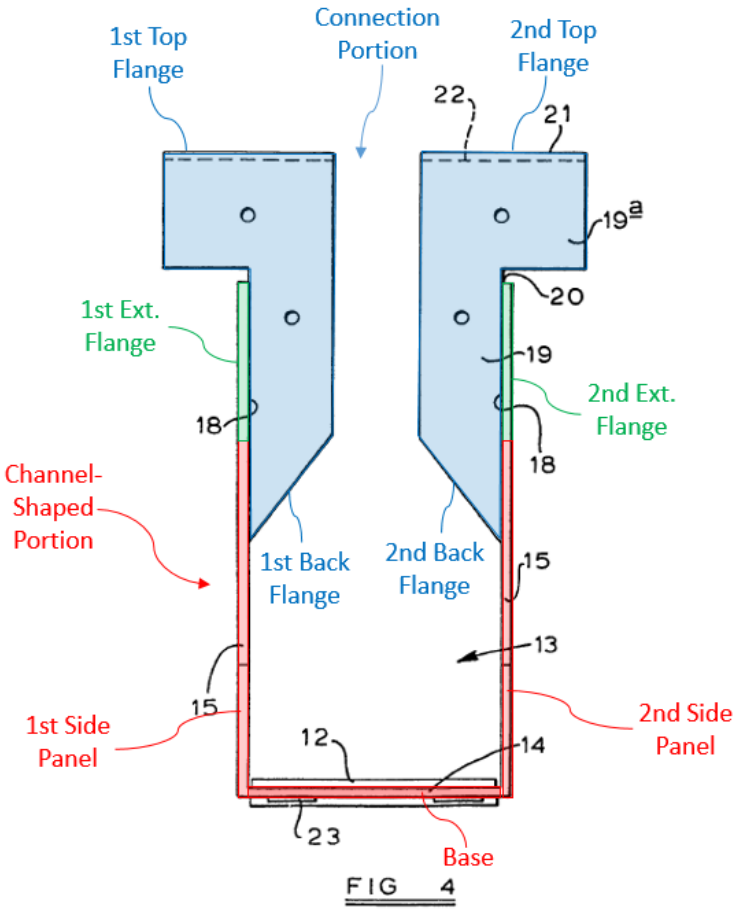
EX1040, FIG. 4 (annotated).

5) Second Back Flange and Second Top Flange

For the reasons discussed in claims 39 and 92, Adams-Bundy discloses that the connection portion includes a second top flange (second bearing portion 22) arranged to engage the top surface of the top plate of the frame wall and a second back flange (second abutment portion 19) extending from an edge (fold line 21) of the second top flange and arranged to engage the vertical face of the top plate of the frame wall. EX1040, 4:22–36; EX1003, ¶309. Being constructed from sheet metal, Adams's second back flange has a front surface lying in the back flange plane. EX1040, 3:56–58; EX1003, ¶309.



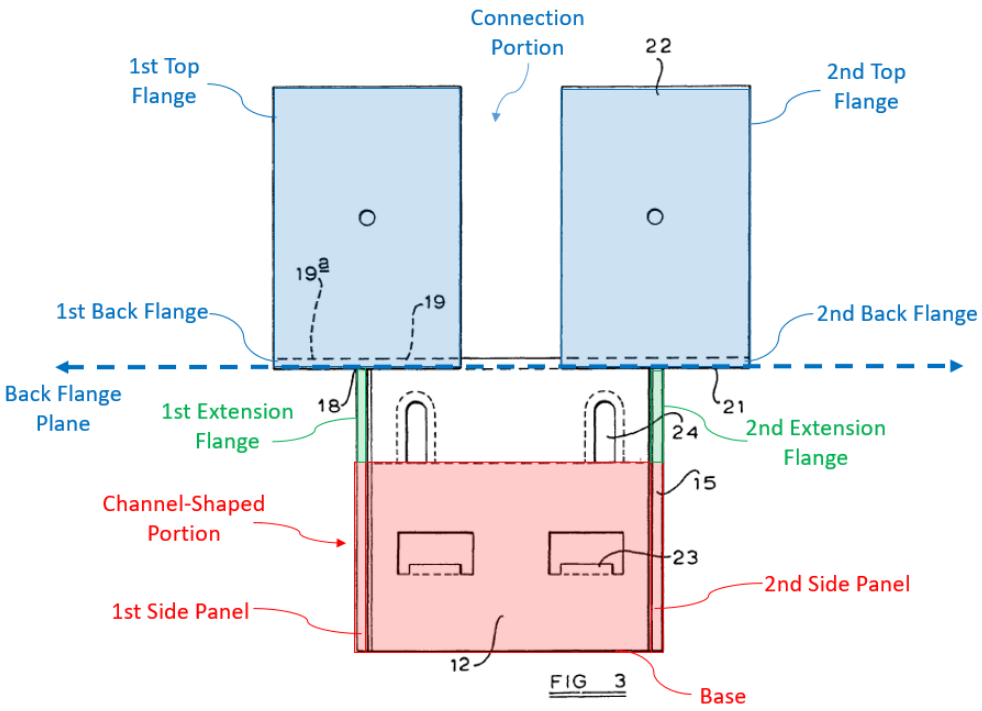
EX1040, FIG. 3 (annotated).



EX1040, FIG. 4 (annotated).

6) Extension Flanges Extending From Back Flanges to Channel-Shaped Portion

As discussed for claims 1.3.A, 39, 41, and 94, Adams discloses that the first extension flange extends from the first back flange to the channel-shaped portion and that the second extension flange extends from the second back flange to the channel-shaped portion. EX1040, 4:11–26; EX1003, ¶310.

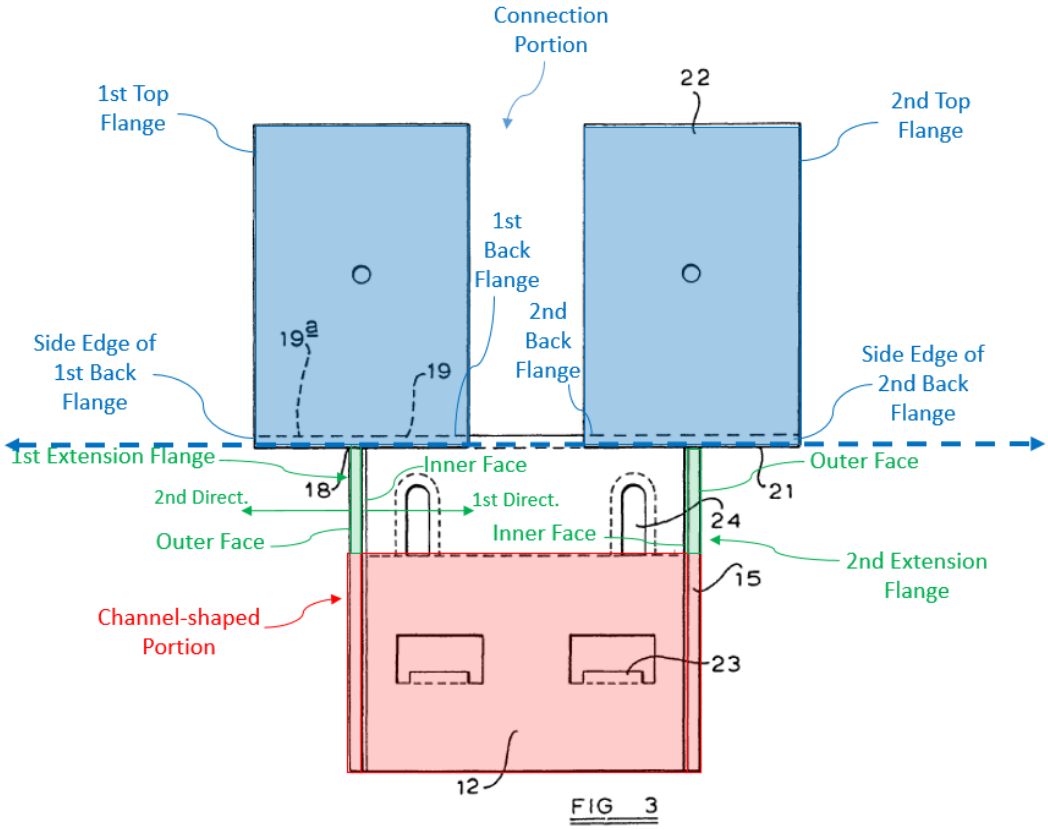


EX1040, FIG. 3 (annotated).

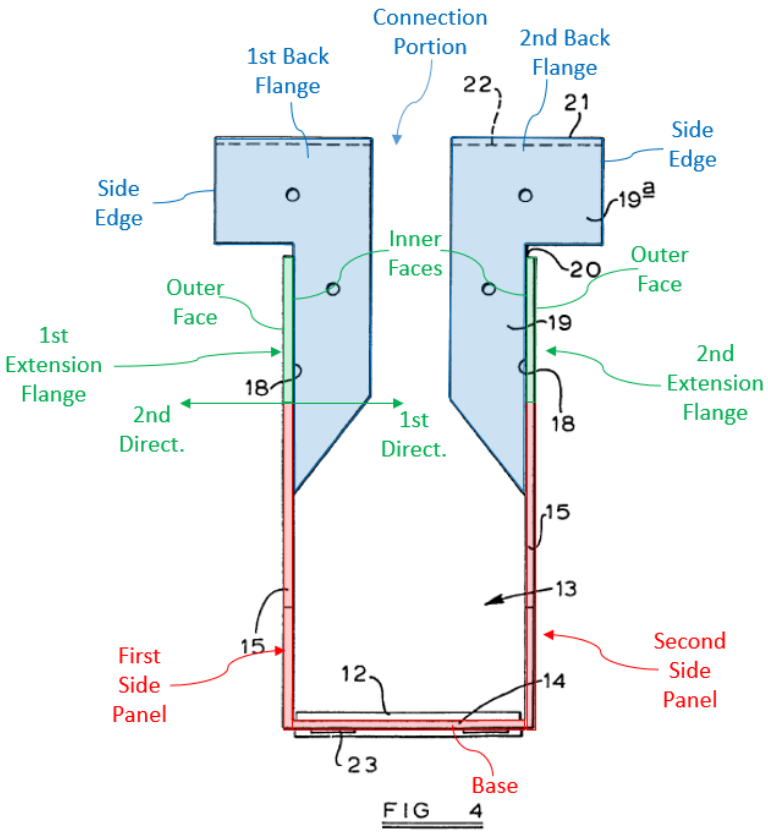
7) Inner and Outer Faces of Extension Flanges and Side Edge of Back Flanges

Adams discloses that the first and second extension flanges (sidewalls 15) each include an inner face and an outer face (annotated below) because they are made of sheet metal with a thickness. EX1040, 3:56–58; EX1003, ¶311. Because sidewalls 15 are parallel to each other, Adams discloses that the inner faces of the first and second extension flanges face one another—the inner face of the first extension flange (first sidewall 15) facing in a first direction toward the inner face of the second extension flange (second sidewall 15), and the outer face of the first

extension flange (first sidewall 15) facing in a second direction that is opposite the first direction, shown below. EX1040, FIG. 3; EX1003, ¶311.



EX1040, FIG. 3 (annotated).



EX1040, FIG. 4 (annotated).

Adams further discloses the first back flange having a side edge (annotated above) disposed outward, in the second direction, of the outer face of the first extension flange, shown above. EX1040, FIG. 4; EX1003, ¶312. Adams further discloses the second back flange having a side edge (annotated above) disposed outward, in the first direction, of the outer face of the second extension flange. EX1040, FIGS. 3–4; EX1003, ¶¶312-313.

IX. 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.TA.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. 23-2145. 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, 1100 New York Avenue, N.W., Washington, D.C., 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**.

X. 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.

XI. Conclusion

For the reasons above, post-grant review of claims 1, 22–27, 39–45, 50–53, 74–79, 92–98, and 103–105 of U.S. Patent No. 11,649,626 is requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/ Michelle K. Holoubek /

Michelle K. Holoubek (Reg. No. 54,179)
Attorney for Petitioner
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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 18,670 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,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/ Michelle K. Holoubek /

Michelle K. Holoubek (Reg. No. 54,179)
Attorney for Petitioner
Simpson Strong-Tie Company Inc.

Date: August 17, 2023

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(202) 371-2600

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 entireties on the following parties via FedEx® Express:

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Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX PLLC

/ Michelle K. Holoubek /

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Simpson Strong-Tie Company Inc.

Date: August 17, 2023

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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 ⅝-inch-thick drywall to be received between the end of the structural component and the back flange plane.

Claim 3

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

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 ⅝-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.

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	

[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.

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.

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	
[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.

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 ⅝-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	

[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.

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 ⅝-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	

[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.

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.

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 ⅝-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.

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 ⅝-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 ⅝-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.

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 ⅝-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	
[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.

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.

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 ⅝-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	
[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 ⅝-inch-thick drywall.

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	
[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.

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.

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 ⅝-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 ⅝-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.