



(51) International Patent Classification:
E06B 1/56 (2006.01)

(21) International Application Number:
PCT/US2009/060844

(22) International Filing Date:
15 October 2009 (15.10.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/268,024 10 November 2008 (10.11.2008) US

(71) Applicant (for all designated States except US): **ILLINOIS TOOL WORKS INC.** [US/US]; 3600 West Lake Avenue, Glenview, Illinois 60026 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GOSIS, Anatoly** [US/US]; 3600 West Lake Avenue, Glenview, Illinois 60026 (US). **CARINGELLA, Anthony** [US/US]; 3600 West Lake Avenue, Glenview, Illinois 60026 (US).

KESTNER, Kyle Thomas [US/US]; 3600 West Lake Avenue, Glenview, Illinois 60026 (US).

(74) Agent: **HAUPTMAN, Benjamin J.**; Lowe Hauptman Ham & Berner, LLP, Suite 300, 1700 Diagonal Road, Alexandria, Virginia 22314 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: SPRING BRACKET FOR FRAMING STUD INSTALLATION

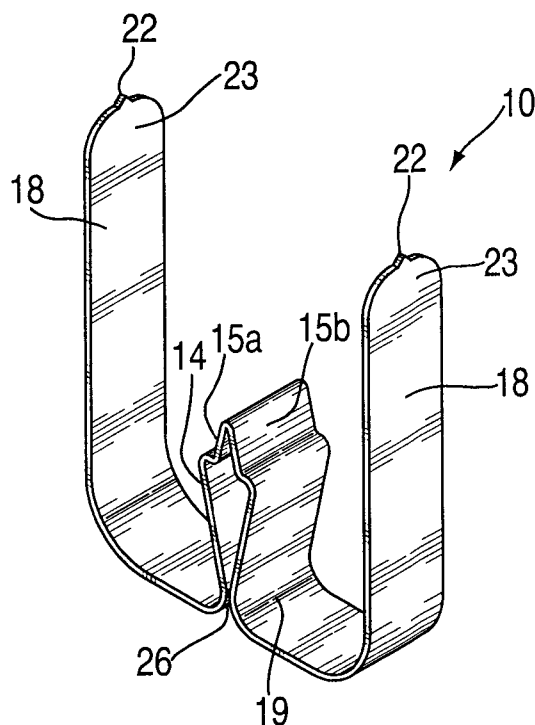


FIG. 1

(57) Abstract: A spring bracket for installing a framing stud between a ceiling and a floor, the spring bracket including at least one clamping portion configured for gripping an end of the frame stud; and at least one leg attached to the clamping portion and configured for engaging the ceiling or floor, wherein the spring bracket is the sole device for securing the framing stud in place relative to the floor upon installation.



ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

— *as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii))*

Published:

Declarations under Rule 4.17:

— *with international search report (Art. 21(3))*

SPRING BRACKET FOR FRAMING STUD INSTALLATION

BACKGROUND

The present invention relates generally to components used in building construction, and more specifically to the installation of framing studs between a ceiling and a floor. The present application is directed to a spring bracket used to facilitate such installation.

5 Metal framing stud-based walls are commonly used in commercial and some residential building construction as they provide a strong and reliable support structure. Such walls use vertically positioned elongate, framing studs having a “[”-shaped cross-section, which are spaced horizontally to form a wall. These framing studs are typically secured in place by fastening both an upper end
10 and a lower end of the framing stud to respective and floor framing tracks, also referred to as headers and footers. Once the framing studs have been installed and properly positioned, the fasteners at the upper end of the framing stud often need to be removed to accommodate a sag in the ceiling. Failure to remove these fasteners can result in a stud columnar deformation.

15 Further, after the framing studs have been installed, sheets of wallboard are fastened to the studs, and wallboard joint compound is applied to seams formed by adjacent panels. However, when applying joint compound, improperly installed fasteners at both ends of the framing stud may cause dimple-

like deformations and associated stress of the naturally brittle joint compound once set. For these reasons, fasteners are typically removed once the framing studs have been installed. Of course, removing these fasteners adds to the total labor time required for these projects.

5

SUMMARY

The above-listed needs are met or exceeded by the present spring bracket for framing stud installation, which features a clamping portion for mounting to a framing stud, and legs for engaging a ceiling or floor. The spring bracket therefore avoids having to use fasteners to secure the framing stud in place. In addition to securing the stud in place without fasteners, the present spring clip bracket accommodates ceiling sagging and maintains the stud position.

More specifically, a spring bracket is provided for installing a framing stud between a ceiling and a floor, including at least one clamping portion configured for gripping an end of the frame stud; and at least one leg attached to the clamping portion and configured for engaging the ceiling or floor, wherein the spring bracket is the sole device for securing the framing stud in place upon installation.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a top perspective view of the present spring bracket;

5 FIG. 2 is a front view of the same;

FIG. 3 is a left side view of the bracket of FIG. 1;

FIG. 4 is a top perspective view of a spring bracket of the present invention, shown mounted on a framing stud;

FIG. 5 is a front view of the spring bracket of the present invention,
10 shown mounted on a framing stud with the legs in a preinstalled position;

FIG. 6 is a front view of the spring bracket of the present invention, shown mounted on a framing stud with the legs in a deformed position;

FIG. 7A is a front perspective view of a second embodiment of the present spring bracket;

15 FIG. 7B is a front perspective view of a third embodiment of the present spring bracket;

FIG. 7C is a front perspective view of a fourth embodiment of the present spring bracket;

FIG. 7D is a front perspective view of a fifth embodiment of the
20 present spring bracket; and

FIG. 7E is a front perspective view of a sixth embodiment of the present spring bracket.

DETAILED DESCRIPTION

Referring now to FIGS. 1-4, a spring bracket, generally designated 10, is shown mounted on a framing stud 12. Included on the spring bracket 10 is at least one clamping portion 14 configured for gripping an upper end 16 of the framing stud 12. Preferably, the clamping portion 14 is generally diamond-shaped when viewed from a front side of the spring bracket 10 (FIG. 2). Other shapes for the clamping portion 14 are also considered, including for example, a generally double diamond-shape 14a when viewed from a front side of the spring bracket 10, wherein one diamond is stacked on top of another diamond (FIGS. 7C, 7D, and 7E).

Attached to the clamping portion 14 is at least one and preferably two legs 18 configured for engaging a ceiling 20 (FIG. 6) and which are moveable between a preinstalled position and a deformed position. Preferably, the legs 18 are generally "L"-shaped, with a short end 19 being connected to the clamping portion 14. However, it is noted that the legs could have different shapes, including for example, a generally "S"-shape or radiused-shape (FIG. 7D). Further, legs 18 including at least one angle-forming bend (FIGS. 7A, 7B, 7D, and 7E) are considered. Included on the legs 18 are at least one friction enhancing formation 22 on a free end 23 for engaging the ceiling 20. Preferably, the formation 22 is generally tooth-shaped, although other shapes are also considered,

including fork-like 22a (FIG. 7A), tabbed 22b (FIG. 7B) and splayed teeth 22c (FIGS. 7C, 7D, 7E).

The clamping portion 14 and the legs 18 are preferably formed out of a continuous, planar strip of spring steel (e.g., AISI 1074 or AISI 1090) or other
5 suitable material to permit movement of the legs between the preinstalled position and the deformed position.

Referring now to FIGS. 4-6, similar to the fastener-based system described in the Background section above, the spring clip 10 is used to install the framing stud 12, securing it between the ceiling 20 and a floor 24. To install the
10 framing stud 12, the spring bracket 10 is mounted on the framing stud such that the clamping portion 14 grippingly engages the upper end 16 of the framing stud. More specifically, clamping action is focused at at least one clamping point 26 where opposing portions 15a, 15b of the clamping portion 14 are closest to each other. The remaining portions of the clamping portion 14 are configured for
15 generating a biasing force at the clamping point 26. Once the bracket 10 is positioned on the stud 12, the framing stud is positioned vertically between the floor 24 and ceiling 20 (FIG. 5), with the legs 18 exerting a downward biasing force on the stud through the clamping portion 14.

A friction causing surface 30 is optionally positioned between a
20 lower end 32 of the framing stud 12 and the floor 24 to reduce movement of the framing stud 12 during and after installation. At the upper end 16 of the framing

stud 12, the friction-enhancing formations 22 engage the ceiling 20 and similarly reduce movement of the framing stud.

Once the spring bracket 10 and the framing stud 12 have been installed between the floor 24 and the ceiling 20, it is likely that the ceiling will eventually sag. When this occurs, the ceiling 20 exerts a downward force on the spring bracket 10, causing the legs 18 to move from the preinstalled position (FIG. 5) to the deformed position (FIG. 6). It is noted that FIG. 6 represents one of many potential deformed leg positions that result from the sagging of ceiling 20. However, it is contemplated that the degree and angle of deflection of the legs 18 may vary depending on the application and upon the configuration of the legs, as seen in FIGS. 6-7E.

Movement of the legs 18 between the preinstalled position and the deformed position also aids the installation of the framing stud 12. Depending on the length of the framing stud 12 and the distance between the floor 24 and the ceiling 20, it is often difficult to fit the framing stud (with a spring bracket 10), between the floor 24 and the ceiling 20. However, installation can be achieved by placing the upper end 16 of the framing stud 12 (with the spring bracket 10 attached) on the ceiling 20 at an angle, followed by straightening out the framing stud by moving the lower end 32 toward the floor 24 to engage the friction-causing surface 30. It is noted that placement of the spring bracket 10 is not limited to the upper end 16 of the framing stud, but is also mountable on the lower end 32, wherein the legs 18 engage the floor 24 rather than the ceiling 20. Further,

while use of a single spring bracket 10 is sufficient to secure the framing stud 12, it is contemplated that spring brackets are mountable on both the upper end 16 and the lower end 32 of the framing stud to further secure the framing stud in place.

In the event that it is difficult to fit the framing stud 12 (with the
5 spring bracket 10 mounted on it) between the floor 24 and the ceiling 20, the legs 18 can be moved towards their deformed position, thereby reducing the total height of the framing stud 12 and spring bracket 10 combination. Once the framing stud 12 and spring bracket 10 are properly positioned, the legs 18 engage and exert a biasing force upon the ceiling 20 as they plant a retaining force
10 towards their preinstalled position.

Unlike the conventional approach of securing the framing stud 14 to the ceiling 20 and the floor 24 using fasteners frame tracks, no fasteners or other parts are required with the present spring bracket 10. As such, the spring bracket 10 is the sole device for securing the framing stud 12 in place relative to the floor
15 24 when the framing stud is installed between the ceiling 20 and the floor 24. The spring bracket therefore avoids the pitfalls encountered by the conventional fastener-based approach.

In particular, the present spring bracket 10 reduces the labor involved in installing framing studs 12. Once the framing studs 12 have been
20 secured, there is no need to remove any fasteners or perform additional steps to prepare for a possible sag in the ceiling 20. Indeed, when the ceiling 20 sags, the resulting force on the bracket 10 causes the legs 18 of the spring bracket 10 to

move from the preinstalled position to the deformed position, while still retaining the framing stud 16 in a secure position. It is noted that the spring bracket 10 can be used for various sizes and dimensions of walls and framing studs 12. By adjusting the biasing force (i.e., the amount of spring precompression) and the
5 length of the legs 18, the spring bracket 10 can be tailored to accommodate walls and framing studs 12 with particular sized and dimensions.

Further, when wallboard compound is eventually applied to the walls, the likelihood of crystal deformations or resulting stress seen with the conventional fastener-based approach are reduced or eliminated.

10 While a particular embodiment of the present spring bracket for framing stud installation has been described herein, it will be appreciated by those skilled in the art that changes and modifications may be made thereto without departing from the invention in its broader aspects and as set forth in the following claims.

CLAIMS:

1. A spring bracket for installing a framing stud between a ceiling and a floor, the spring bracket comprising:

at least one clamping portion configured for gripping an end of the frame stud; and

at least one leg attached to said clamping portion and configured for engaging the ceiling or floor, wherein said spring bracket is the sole device for securing the framing stud in place relative to the floor upon installation.

2. The spring bracket of claim 1 wherein each of said at least one leg is moveable between a preinstalled position and a deformed position, wherein each said leg moves from said preinstalled position to said deformed position upon said ceiling sagging and exerting a downward force on said spring bracket.

3. The spring bracket of claim 2 wherein an end of each said leg has at least one friction enhancing formation for engaging said ceiling.

4. The spring bracket of claim 1 wherein said at least one clamping portion and said leg are formed out of a continuous planar strip of material.

5. The spring bracket of claim 4 wherein said material is spring steel.

6. The spring bracket of claim 4 wherein said at least one clamping portion is generally diamond-shaped when viewed from a front side of said spring bracket.

7. The spring bracket of claim 1 wherein said at least one clamping portion is generally diamond-shaped when viewed from a front side of said spring bracket.

8. The spring bracket of claim 1 wherein said at least one clamping portion is generally double diamond-shaped when viewed from a front side of said spring bracket.

9. The spring bracket of claim 1 wherein each said leg is generally "L"-shaped.

10. The spring bracket of claim 1 wherein each said leg is generally "S"-shaped.

11. The spring bracket of claim 1 wherein each said leg includes at least one angle-forming bend.

12. The spring bracket of claim 8 and wherein each said leg is generally "L"-shaped.

13. The spring bracket of claim 12 wherein an end of each said leg has at least one generally tooth-shaped friction enhancing formation for engaging said ceiling.

14. The spring bracket of claim 13 wherein said material is spring steel.

15. a framing stud system for use between a ceiling and a floor, comprising:

A framing stud disposed between the ceiling and the floor;

a spring bracket having at least one clamping portion gripping a first end of the frame stud, and having at least one leg attached to said clamping portion for engaging the ceiling or the floor; and

a friction causing surface disposed between a second end of said framing stud and the ceiling or the floor.

1/4

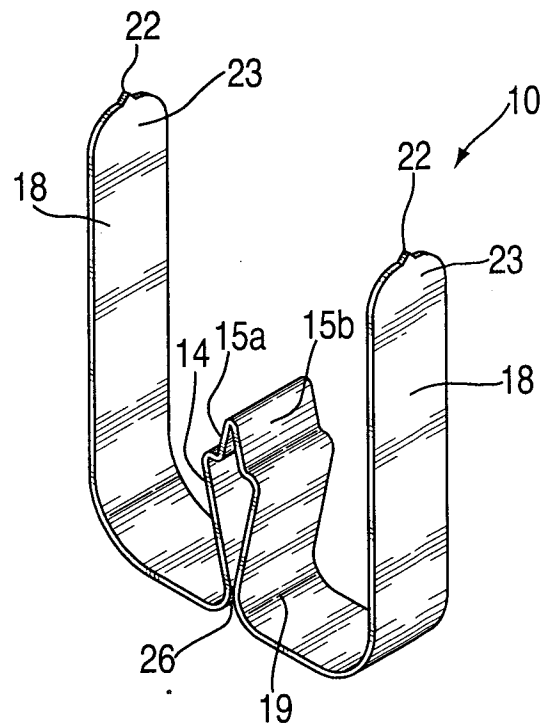


FIG. 1

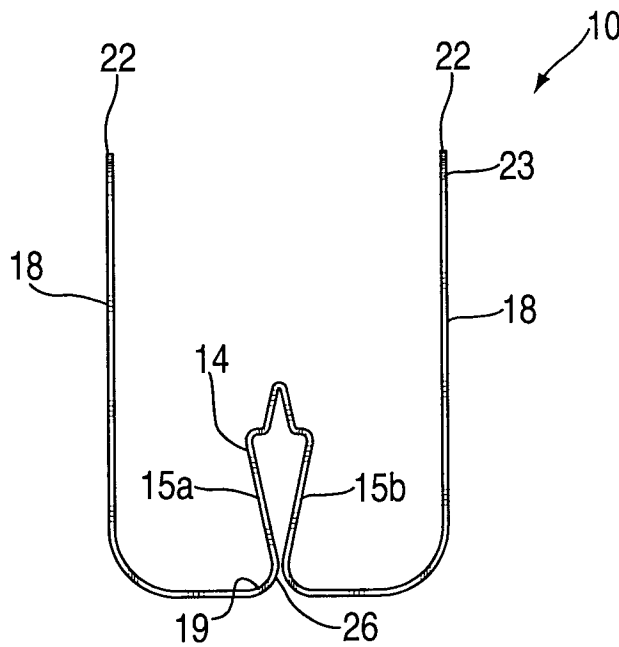


FIG. 2

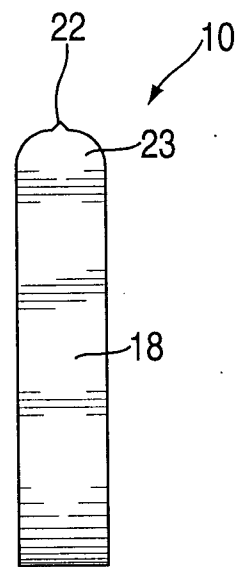


FIG. 3

2/4

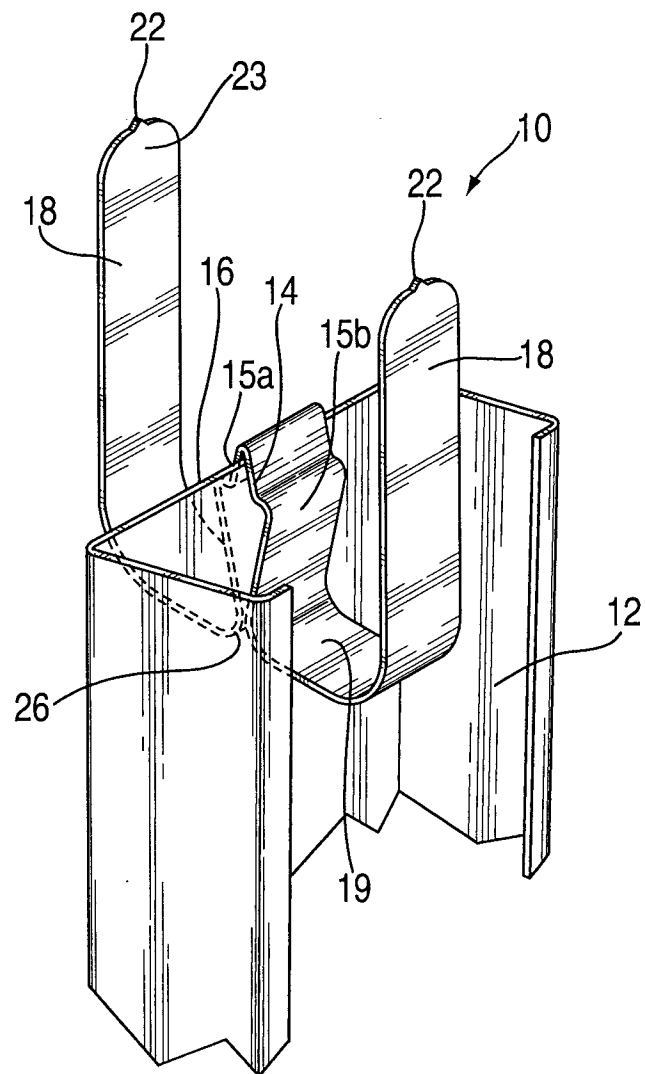


FIG. 4

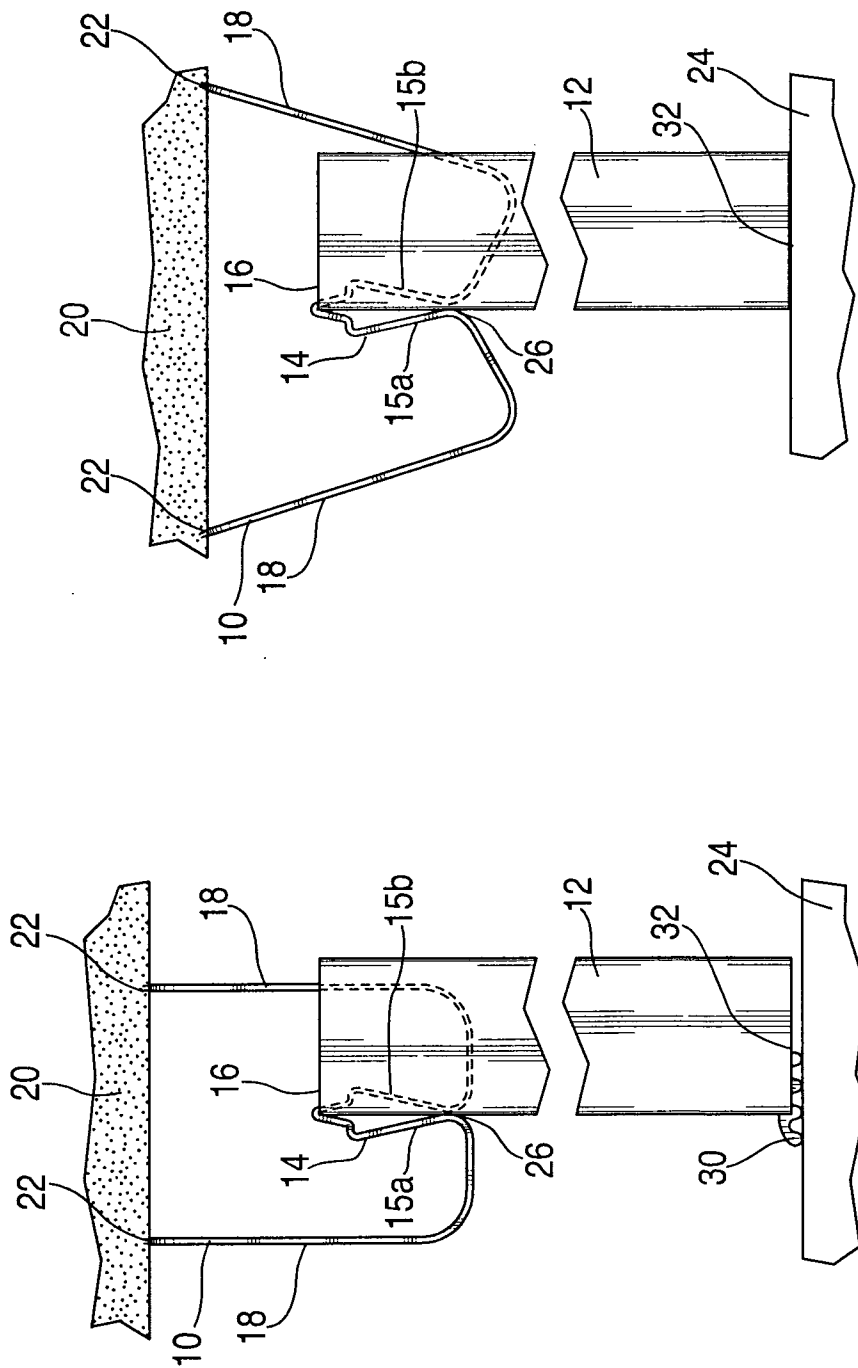


FIG. 6

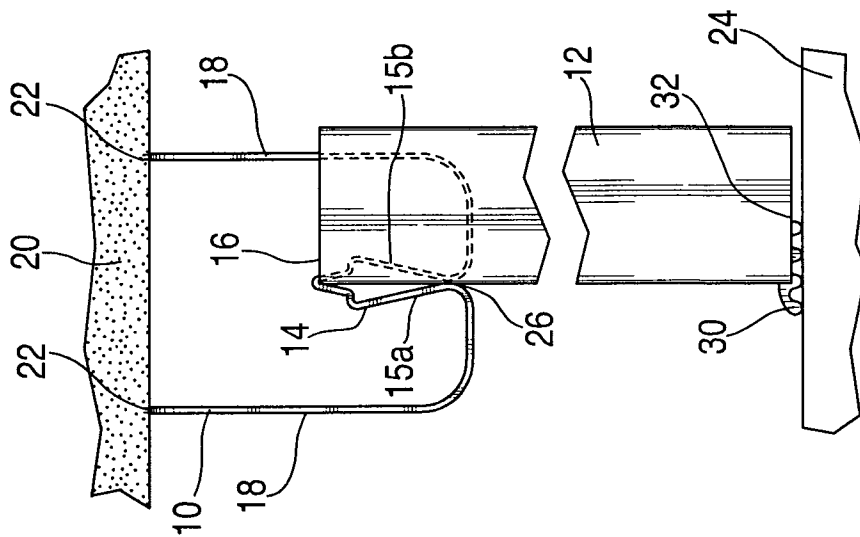


FIG. 5

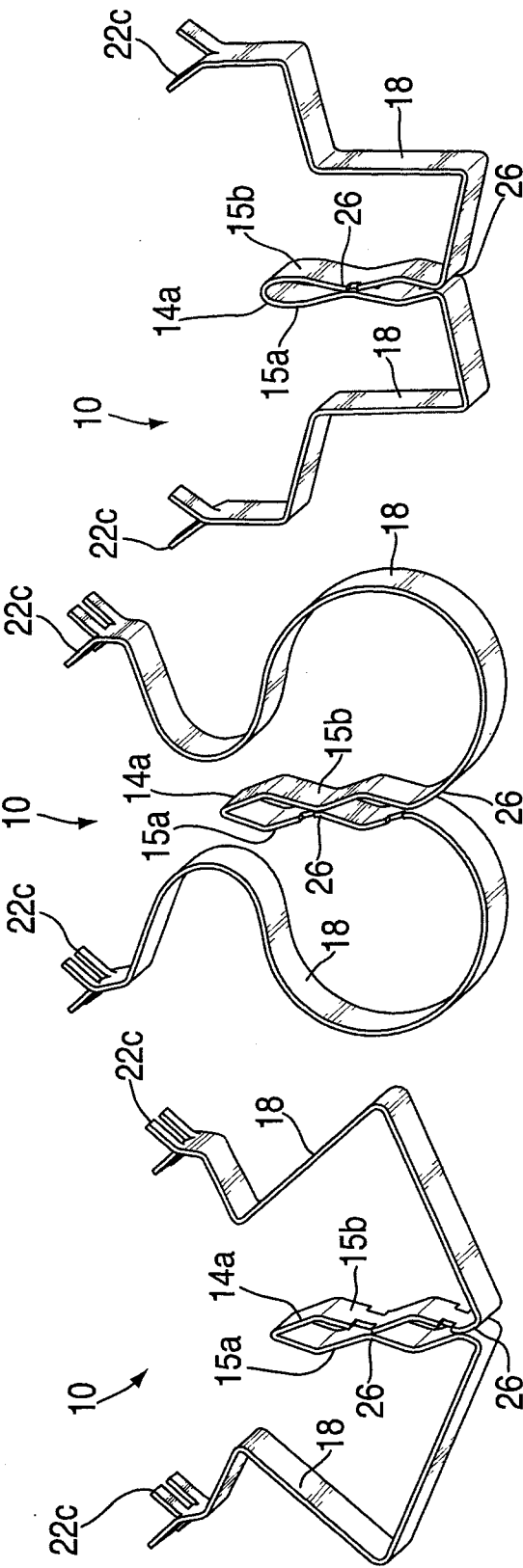
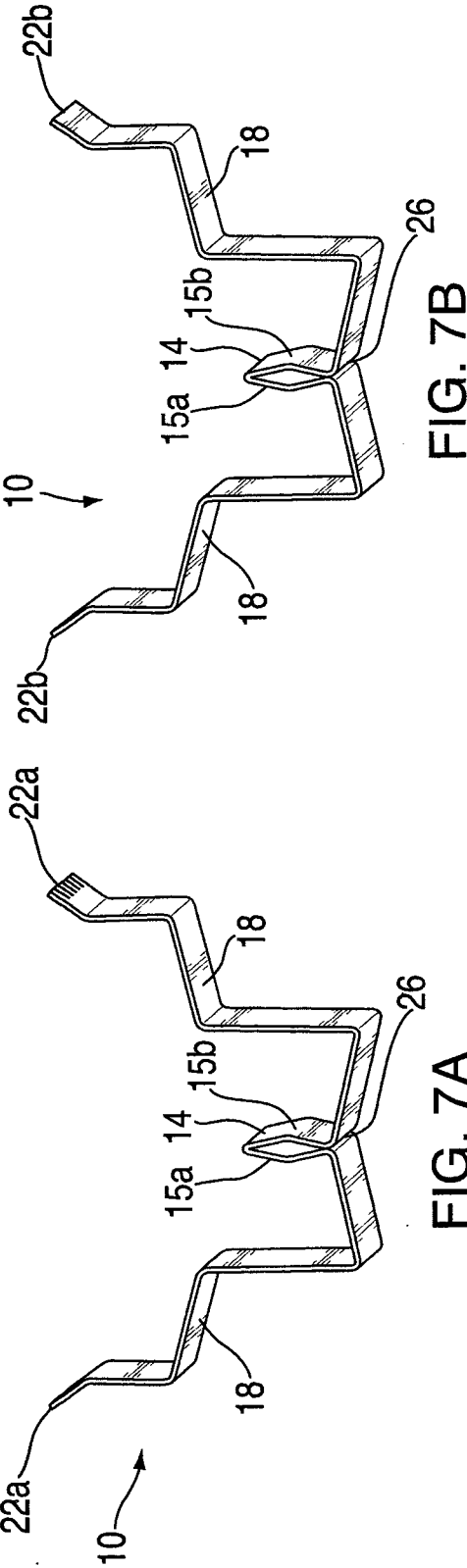


FIG. 7E

FIG. 7D

FIG. 7C

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/060844

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - E06B 1/56 (2009.01)

USPC - 52/769

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - E04B 1/41; E06B 1/56 (2009.01)

USPC - 52/489.1, 489.2, 769, 770, 771; 248/623, 624

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2,526,532 A (BEDFORD JR) 17 October 1950 (17.10.1950) entire document	15
Y		1-14
Y	US 3,094,201 A (WILLIAMS) 18 June 1963 (18.06.1963) entire document	1-14
Y	US 4,995,605 A (CONVILLE) 26 February 1991 (26.02.1991) entire document	2-3
Y	US 4,408,428 A (BROOKE et al) 11 October 1983 (11.10.1983) entire document	9, 12-14

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

01 December 2009

Date of mailing of the international search report

11 DEC 2009

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774