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(54) **APPARATUS FOR MOUNTING ELONGATE ARCHITECTURAL PANELS TO A STRUCTURE**

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(75) Inventor: **Percy Greenberg**, Minnetonka, MN (US)

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Correspondence Address:

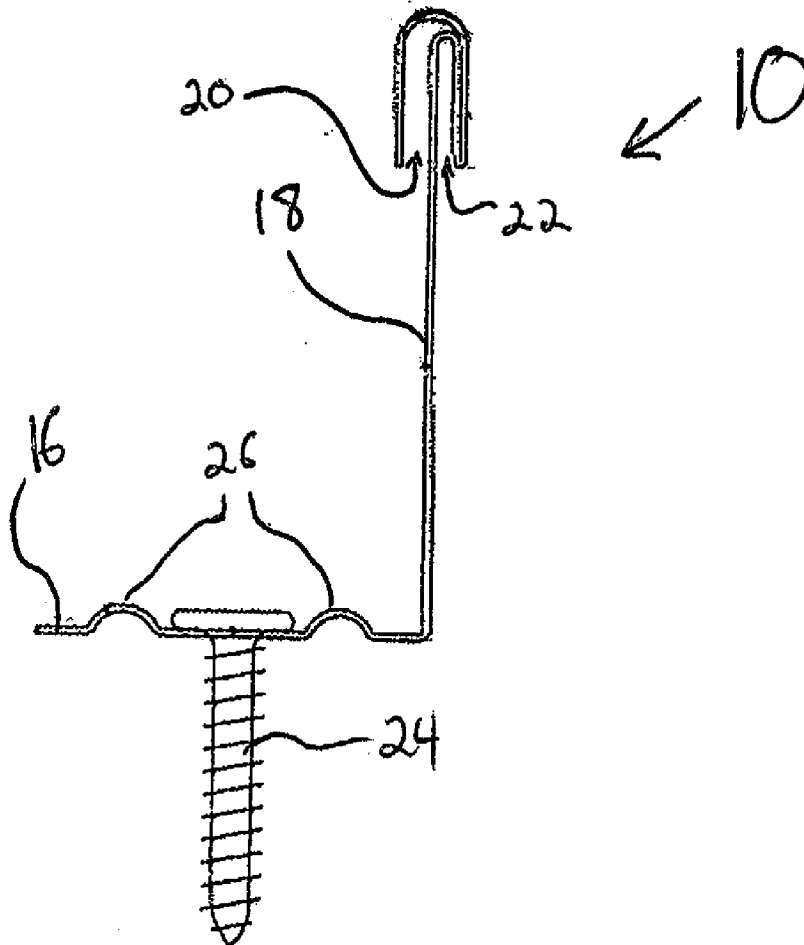
Wayne A. Sivertson
NAWROCKI, ROONEY & SIVERTSON, P.A.
Broadway Place East, Suite 401
3433 Broadway Street Northeast
Minneapolis, MN 55413 (US)

(57) **ABSTRACT**

Apparatus for mounting elongate architectural panels to a structure and a method of forming the apparatus. The panels are of the type having longitudinal flanges extending from the panel, along opposite sides. The apparatus includes a clip which has a generally planar base with a leg extending from the base. Two downwardly opening slots at the leg terminus are each adapted to engage a flange of a different architectural panel.

(73) Assignee: **Crown-PN L.L.C.**

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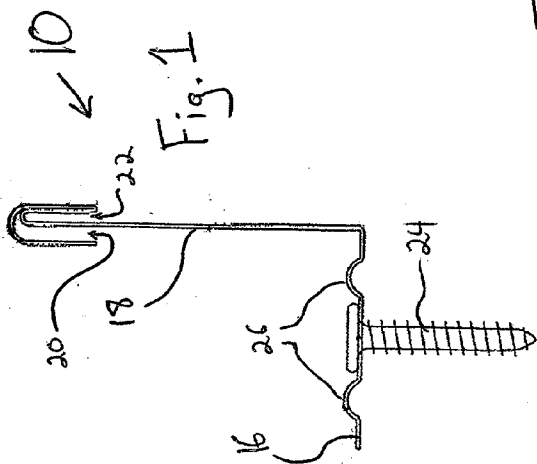
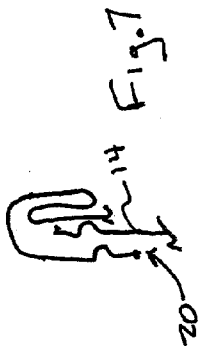
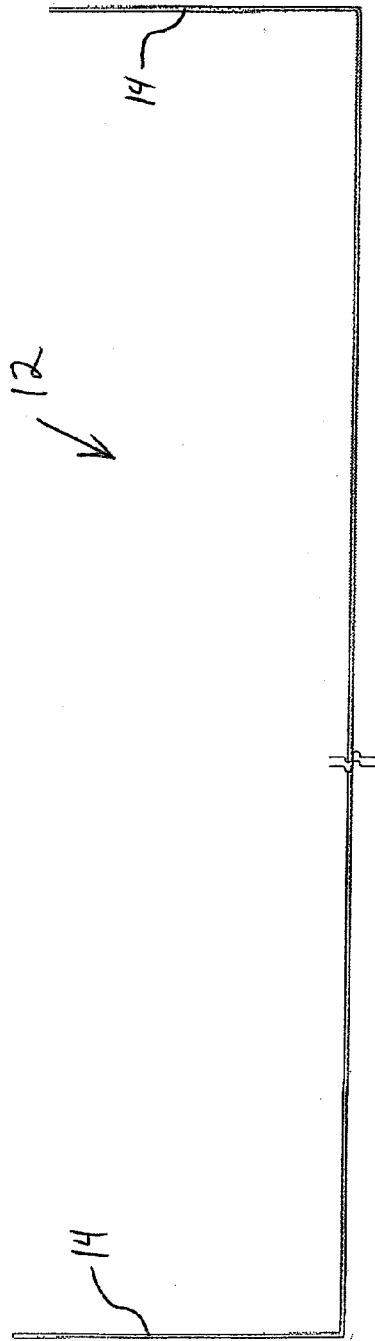


Fig. 2



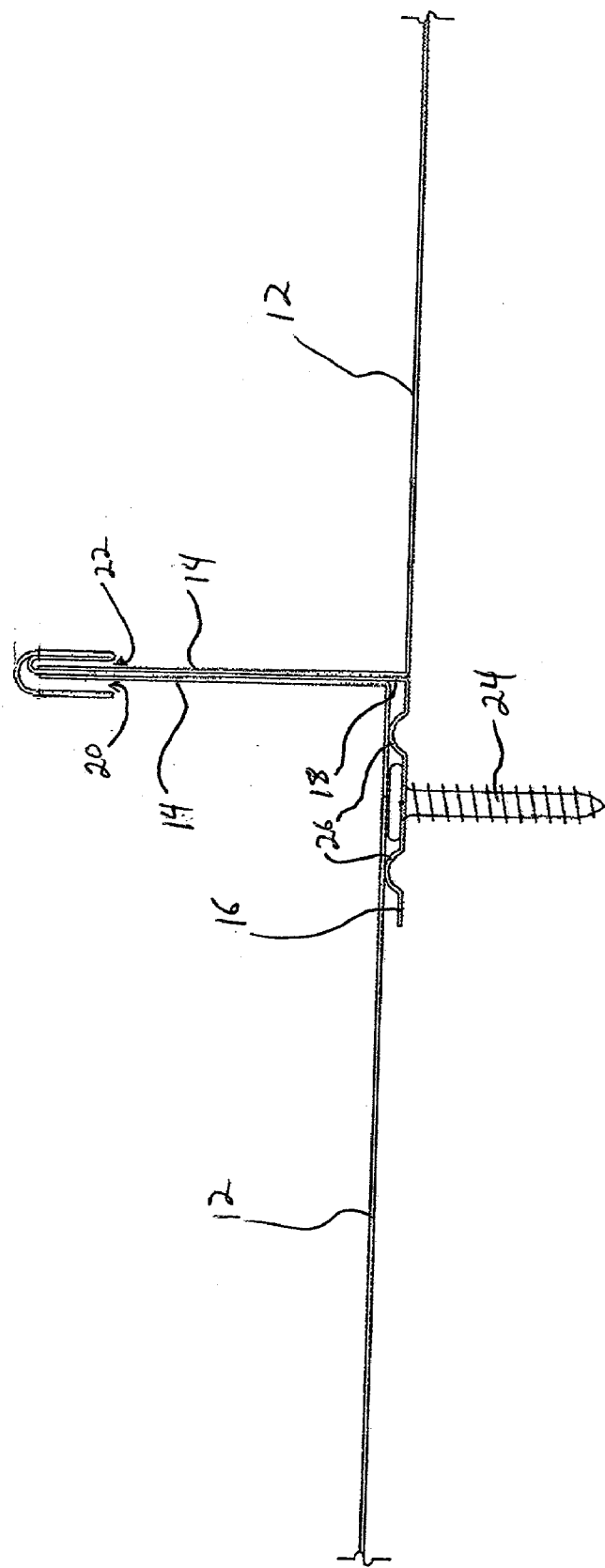
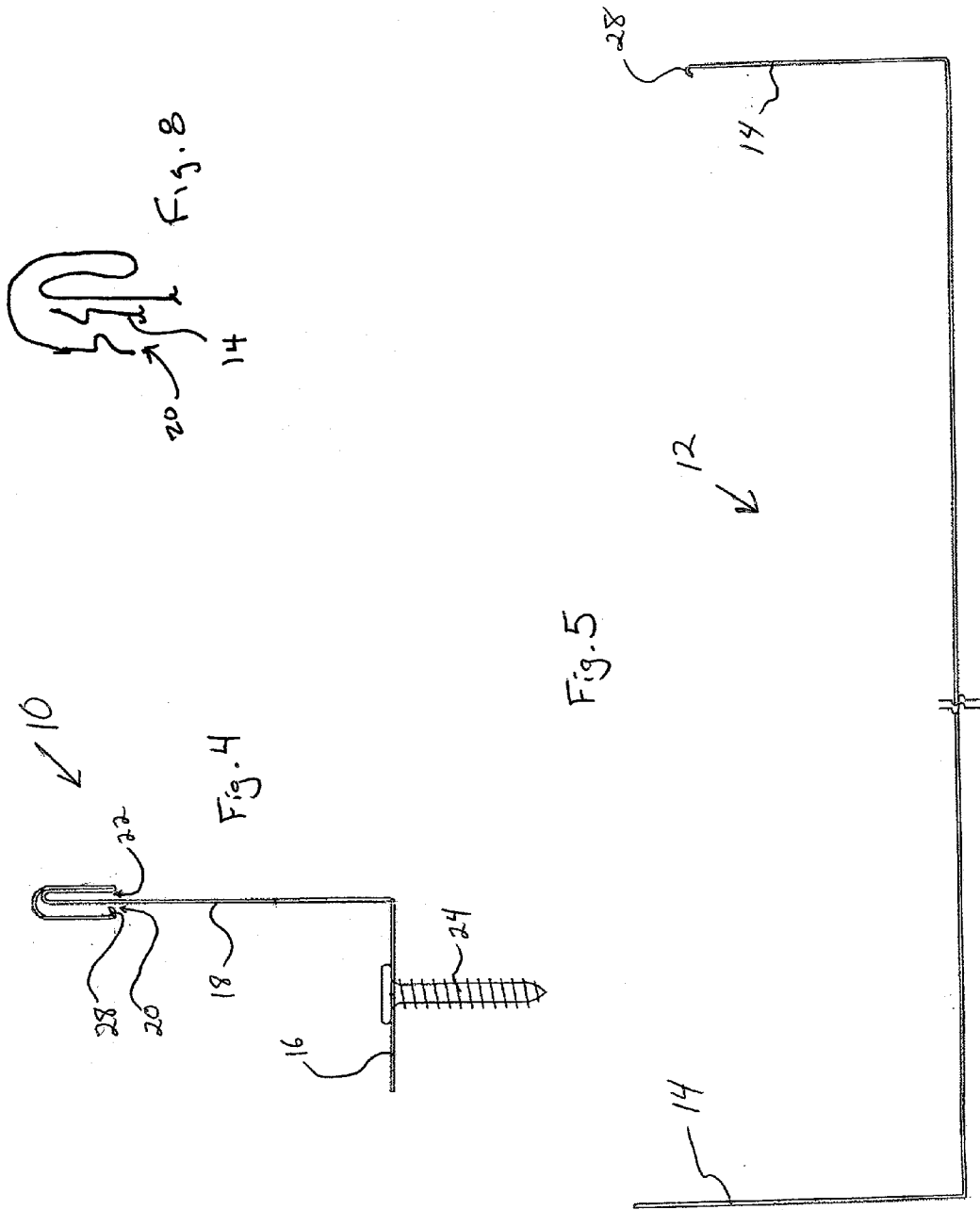


Fig. 3



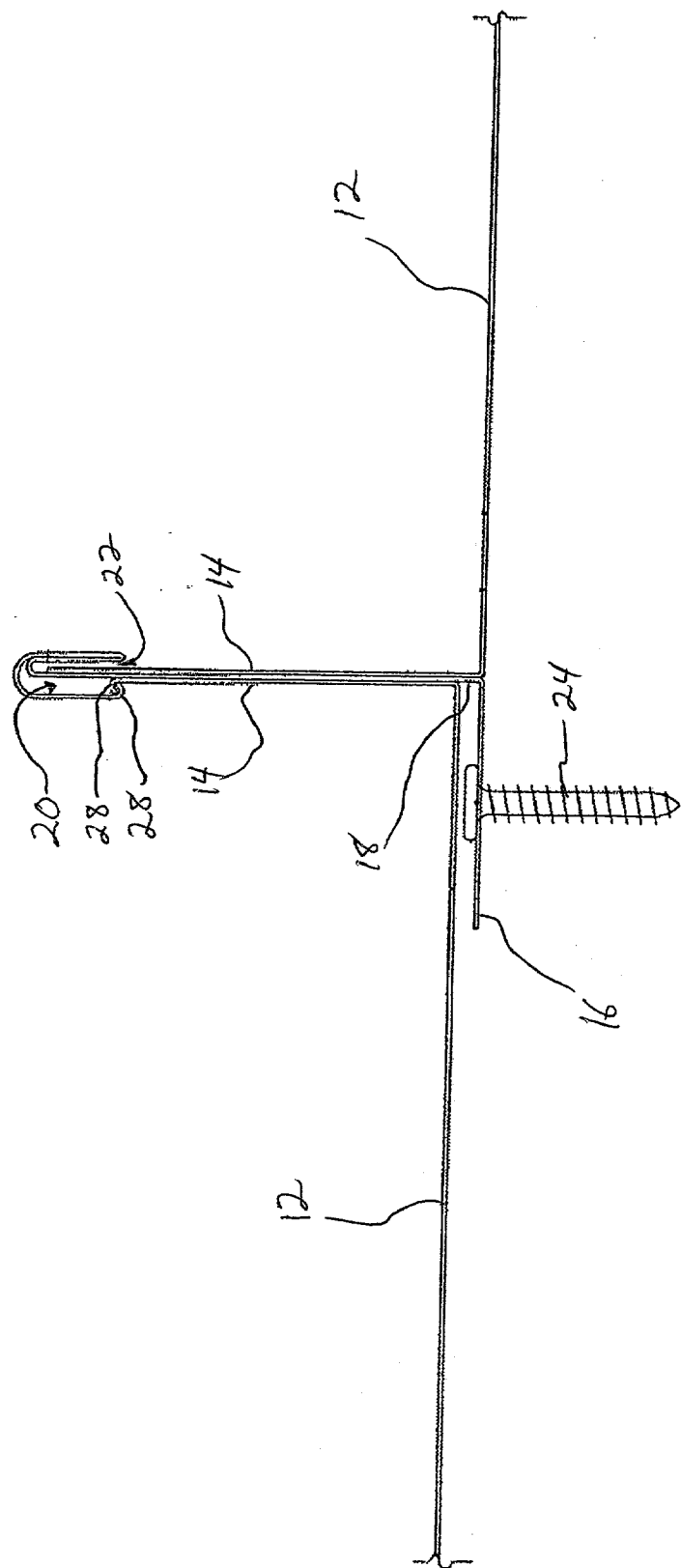


Fig. 6

APPARATUS FOR MOUNTING ELONGATE ARCHITECTURAL PANELS TO A STRUCTURE

BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to architectural panels. In particular, the present invention provides a device for mounting elongate architectural panels. The device includes an elongate clip and flange assembly that may be utilized to attach panels to the surfaces of structures and, more particularly, to interlock standing seam panels into a unitized structure.

[0002] Interlocking building panels are traditionally utilized on walls, roofs, and similar surfaces. Such interlocking panels are easily fabricated and installed to provide a surface covering that is durable, pleasing to the eye, and, when assembled on a structure, form a unitized surface of a plurality of smaller interlocking panels.

[0003] Standing seam panels are a type of interlocking panel that is commonly utilized. A typical standing seam system is an assembly of planar panels that interlock on at least two edges by means of flanges extending from the panel on each edge.

[0004] The basic principle of standing seam systems is that the flanges of two adjacent panels are affixed to form a seam, with the seam being spaced from (above) the surface of the panel. This arrangement allows water and/or in some situations snow or slush to be drained away along the planar surface of the panels without infiltration into the seam.

[0005] Traditionally, the flanges of the adjacent panels are simply crimped together as the panels are fastened to a structure. A clip fastens the panels to the structure with the heads of the fasteners that secure the panels being hidden beneath the surface.

[0006] Several types of clips have been developed. The most common is a structure having a planar base and an extending leg. The planar clip base provides a surface for fasteners to engage. The leg is planar and is simply crimped, typically by rolling or folding, with the flanges of adjacent panels, thereby fixing the clip and the panels together. The clip base is fastened by screws, nails, or other such common fasteners, to the surface of the structure.

[0007] The crimping of the panels to the clips is typically accomplished at the worksite during installation. This task may be accomplished by hand or by known crimping machines. Crimping machines typically have a plurality of rollers which fold or roll the top of the flanges and clip leg together, thereby providing an aesthetically pleasing seam.

[0008] Traditionally, clips have had a small dimension along the length of the panel. When they are rolled with the flanges of the interlocking panels, the exterior appearance of the rolled portion may appear non-uniform due to the inconsistency of the thickness of the crimped material. Additionally, the alignment of the panels must be precise; once the panels are crimped to the clips, they cannot easily be adjusted.

[0009] Other problems exist with prior art clip designs. For example, read-through of the clips, or the heads of the fasteners used to attach the clips to the structure, is a common problem. Failure to adequately accommodate thermal expansion of the panels is another issue. Also, because

of the crimping method, there is a different shadowline from one side of the seam to the other.

SUMMARY OF THE INVENTION

[0010] The present invention provides an apparatus for mounting elongate architectural panels to a structure. The panels are of the type having longitudinal flanges, extending from the panel, along opposite sides of the panel. The apparatus includes an elongate clip which has a generally planar base with a leg extending from the base. The clip also includes two downwardly opening slots or throughs formed on the leg. Each of the slots is adapted to engage a flange of a different architectural panel.

[0011] The longitudinal dimension of the elongate clip may be substantially as long as the length of the architectural panels or as long as the length of the structure surface to which the architectural panels will be mounted. The slots are preferably formed at the terminus of the leg. The leg and/or the flanges of the panels may be provided with a structure for engagement between the flange and slot. The structures may be any known cooperating structures such as hooks, for example.

[0012] In one embodiment, the clips may be formed from elongated planar sheet material by longitudinally bending the sheet to form a base and a leg; bending the leg to form a first downwardly opening slot on one side of the leg; and bending the sheet back over the top of the leg to form a second downwardly opening slot on the other side of the leg. A connecting structure, such as a hook, may be formed in one or both of the slots.

[0013] The aforementioned benefits and other benefits of the invention will become clear from the following description by reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] **FIG. 1** is a side perspective view of an embodiment of the clip apparatus of the present invention;

[0015] **FIG. 2** is a side perspective view of an interlocking panel for use with the embodiment of **FIG. 1**;

[0016] **FIG. 3** is a side perspective view of the clip apparatus of **FIG. 1** attached to two interlocking panels;

[0017] **FIG. 4** is a side perspective view of another embodiment of the clip apparatus of the present invention;

[0018] **FIG. 5** is a side perspective view of an interlocking panel for use with the embodiment of **FIG. 4**;

[0019] **FIG. 6** is a side perspective view of the clip apparatus of **FIG. 4** attached to two interlocking panels; and

[0020] **FIGS. 7 and 8** show alternative embodiments to a portion of the structure of **FIGS. 1-6**.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Referring now to the drawings wherein like reference numerals denote like elements throughout the several views, a clip **10** constructed according to an embodiment of the present invention is shown in **FIG. 1**. As shown in **FIGS. 3 and 6**, the clip **10** is utilized for mounting two different panels **12** to a building surface, not shown.

[0022] Clip 10 is an elongated member having a generally planar base 16 with a leg 18 extending from the base 16. The clip 10 is adapted to engage architectural panels 12 which have longitudinal flanges 14 along opposite sides of the panel. The flanges 14 are engaged within downwardly opening slots 20 and 22 on the leg 18 of clip 10 to secure the panel 12 to the surface of a structure via the clip 10. As shown in FIGS. 3 and 6, each of the slots 20 and 22 is adapted to engage a flange 14 of a different architectural panel 12.

[0023] The engagement between the flanges 14 and slots 20 and 22 can provide several useful benefits. For example, the engagement of the slots and flanges maintains the position of the panels against the structure. Additionally, the flanges 14 and slots 20 and 22 can be adapted to position the panel above the base 16 of the clip 10 (and the heads of any fasteners 24 that may be protruding through the base 16) to prevent or reduce read-through.

[0024] With regard to the design of the clip, the longitudinal dimension (dimension perpendicular to the page of the Figures) of the elongate clip 10 may be substantially as long as the length of the architectural panels 12 or as long as the length of the structure surface on which the architectural panels 12 will be mounted. The slots 20 and 22 are preferably formed at the terminus of leg 18. The leg 18 and/or the flanges 14 of the panels 12 may be provided with a structure for engaging the flanges 14 within the slots 20 or 22. Any structure known in the art may be utilized for this purpose. For example, this structure may be as simple as engagement of the straight end (terminus) of the flange 14 or may be a commonly utilized connection structure such as hooks, male/female connectors, etc. For example, FIGS. 4-6 show a hook/hook relationship. Other alternatives are shown in FIGS. 7 and 8.

[0025] As shown, the clip 10 is typically mounted to a structure by means of fasteners 24. The fasteners utilized may be any known in the art, including nails, screws, staples, etc. The clip 10 is preferably adapted to maintain the position of the panel 12 in a spaced relationship to the fasteners 24. Any structure known in the art may be utilized to provide this spaced apart relationship. Two examples of such structures are ridges shown at 26 in FIGS. 1-6.

[0026] The embodiment in FIGS. 1-3 shows a structure wherein the base 16 of the clip 10 is adapted to space the panel 12 from the fasteners 24. In this embodiment, the base 16 has a predetermined location for a fastener 24. The base 16 also has at least one raised longitudinal portion or ridge 26 thereon. As shown in FIGS. 1 and 3 the base 16 preferably has two raised ridges 26, wherein the predetermined fastener location is oriented between the raised ridges 26. The ridges 26 preferably extend the length of the clip. In this particular embodiment, one edge of the panel is elevated with respect to the other. Accordingly, the panel 12 may have one flange 14 that is shorter than the opposite flange 14.

[0027] In the embodiment shown in FIGS. 4-6 one of the slots and one of the flanges are provided with hook structures 28 that cooperate to maintain the position of the panel in a raised relationship with respect to the base 16 of clip 10 and the fasteners 24. It is foreseeable that other connection structures may be utilized on both flanges and slots. One such structure is an elongated dimple or ridge as shown at 26, the ridge being formed in one or both of the panel flanges

14 a cooperating ridge structure formed in the associated slot of the clip 10. Such structures are shown in FIG. 7. An alternative, "nose" configuration is shown in FIG. 8.

[0028] It is preferred that a clip in accordance with the present invention be formed through a method of bending a single longitudinal planar sheet of material. The method includes the steps of: bending the sheet to form a base 16 with a leg 18 extending from the base 16; bending the leg 18 to form a first downwardly opening slot 20 on one side of the leg; and bending the leg to form a second downwardly opening slot 22 on the other side of the leg. The method may also include the step of bending the sheet to form a connection structure such as hooks (FIGS. 4 and 6), dimple (FIG. 7) or nose (FIG. 8).

[0029] The panel 12, has flanges 14 along opposing two edges. The flanges 14 of the panel 12 should be sized and adapted such that they will not emerge from their position within the slots. Preferably, the panels should at least remain fixed in position when acted upon by the forces of nature, such as wind or gravity acting on heavy snow or ice that has accumulated thereon. Furthermore, the clip 10 and panel 12 may be constructed from any suitable material known in the art. Some examples of suitable materials include: stainless steel, galvanized steel, cold rolled steel, copper, aluminum, plastic, fiberglass, and the like. Additionally, the thickness of the material may be any suitable thickness. The present invention also provides for the installation of panels on a structure without having to permanently affix the panels, by crimping the flanges 14, for example. This enables the panels to be more easily installed and individual panels replaced.

[0030] Since many embodiments of the present invention are possible without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not as limiting.

What is claimed is:

1. Apparatus for mounting elongate architectural panels to a structure, the panels being of the type having longitudinal flanges along opposite sides, the apparatus including an elongate clip which comprises;

a generally planar base with a leg extending from said base; and

two downwardly opening slots formed on said leg, each slot being adapted to engage a flange of a different architectural panel.

2. The apparatus according to claim 1, wherein the longitudinal dimension of said elongate clip is substantially as long as the length of said architectural panels.

3. The apparatus according to claim 1, wherein the longitudinal dimension of said elongate clip is substantially as long as the length of the structure to which it is desired to mount said architectural panels.

4. The apparatus according to claim 1, wherein said slots are formed at the terminus of said leg.

5. The apparatus according to claim 1, wherein said leg further comprises means for maintaining a flange within one of said slots.

6. The apparatus according to claim 1, wherein said panel flanges have means for maintaining said flanges within said slots.

7. The apparatus according to claim 1, wherein said leg and said panel flanges have cooperating means for maintaining said flanges within said slots.

8. The apparatus according to claim 6, wherein said clip is constructed from a single piece of material.

9. The apparatus according to claim 1, wherein said panel has flanges on at least two edges.

10. The apparatus according to claim 9, wherein one upstanding flange is shorter than at least one other flange.

11. The apparatus according to claim 10, wherein said clip is adapted to be mounted to a structure by means of fasteners and said clip further comprises means for maintaining said panel in a position spaced from said fasteners.

12. The apparatus according to claim 1, wherein said base has a predetermined fastener location, said base having at least one raised ridge on said base adjacent said fastener location.

13. The apparatus according to claim 12, wherein said base has two raised ridges with said predetermined fastener location lying between said ridges.

14. A method of forming a clip apparatus from an longitudinal planar sheet of material, the steps comprising;

bending said sheet to form a base and a leg extending from said base;

bending said leg to form a first downwardly opening slot; and

bending said leg to form a second downwardly opening slot.

15. The method of claim 14, wherein said further comprising the step of bending said leg to form a connection structure therein.

16. The method of claim 15, wherein said connection structure is a hook.

17. The method of claim 15 wherein said connection structure has a ridge configuration.

18. The method of claim 15 wherein said connection structure has an elongated nose configuration.

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