US 20090301021A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2009/0301021 A1**

(43) **Pub. Date: Dec. 10, 2009**

Jenny

(54) **INTERLOCKING PANEL SYSTEM**

(76) Inventor: **Carl J. Jenny**, Toms River, NJ (US)

Correspondence Address:
MICHAEL R. PHILIPS
P.O. BOX 1818
TOMS RIVER, NJ 08754-1818 (US)

(21) Appl. No.: **12/157,277**

(22) Filed: **Jun. 9, 2008**

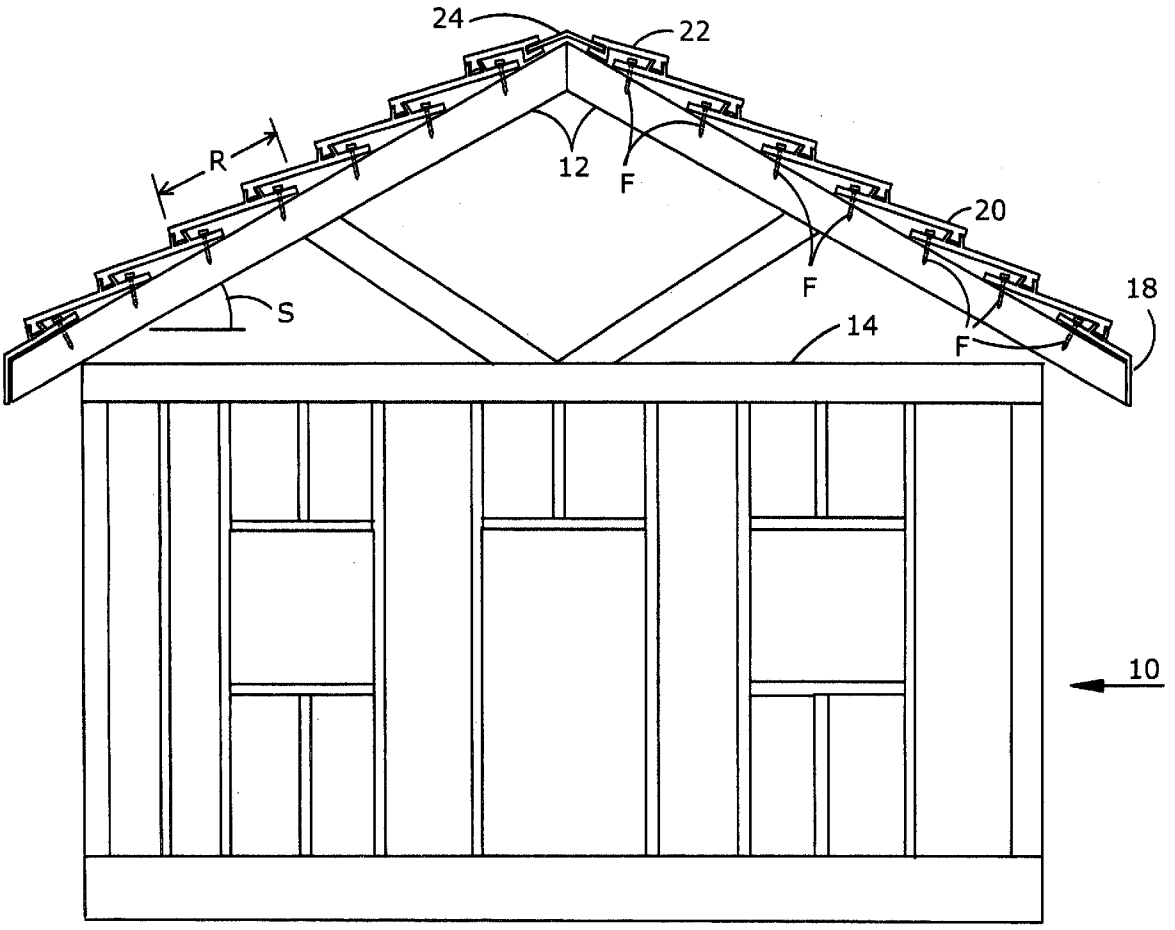
Publication Classification

(51) **Int. Cl.**
E04B 1/38 (2006.01)

(52) **U.S. Cl.** **52/582.2**

(57) **ABSTRACT**

A system is provided having a number of interlocking panels for constructing a building. Each of the panels has a linear concave member protruding from a first surface and a linear convex member protruding from a second surface. The convex member is configured to slide linearly into the concave member and become locked therein against separation in a direction perpendicular to the line of sliding. The convex member is positioned adjacent to a first edge of each panel and the concave member is positioned adjacent to a second edge of each panel in a manner that when assembled, a first assembled panel is offset from a second assembled panel, creating a lapped series. The panels additionally have holes for being fastened to a building frame.



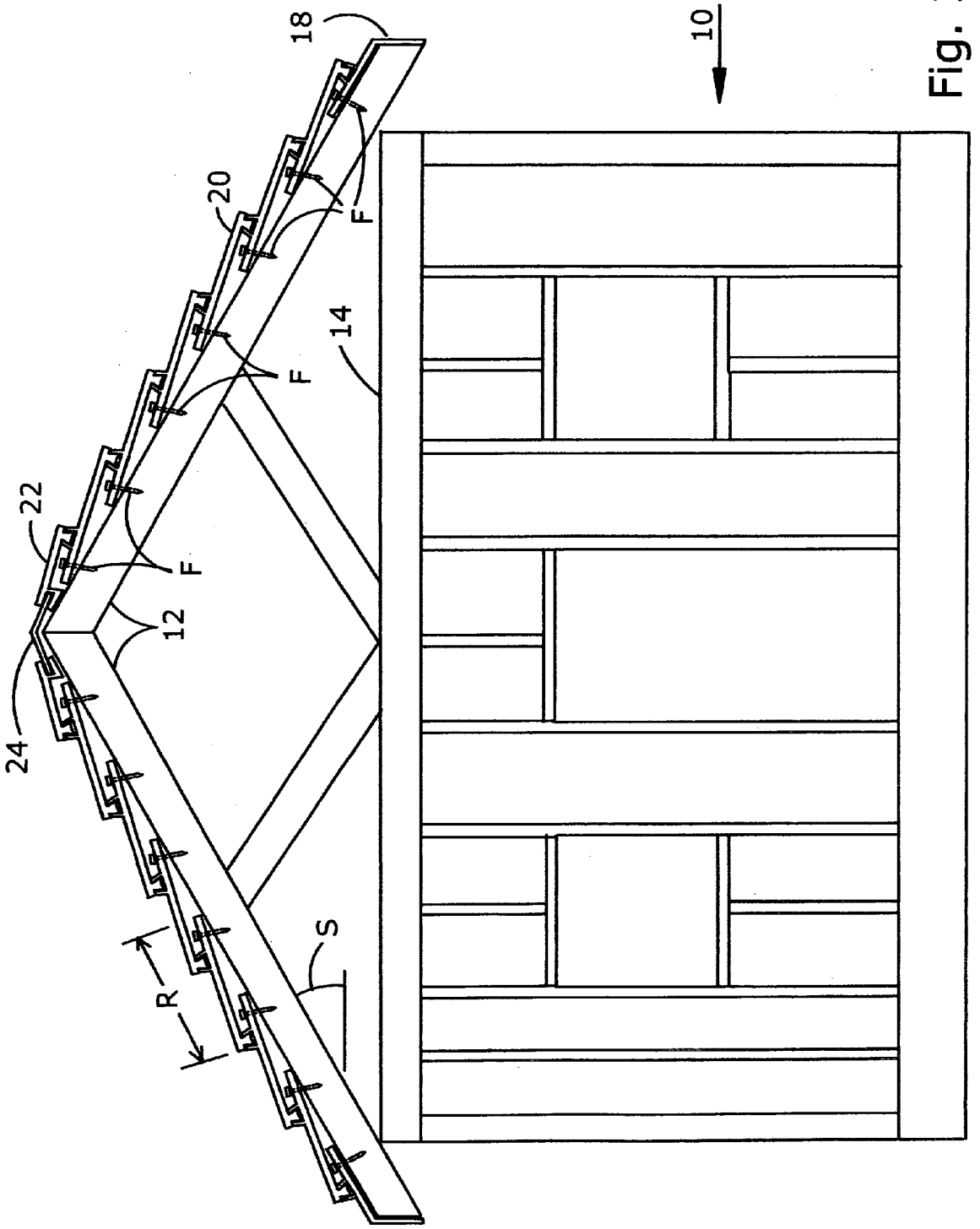


Fig. 1

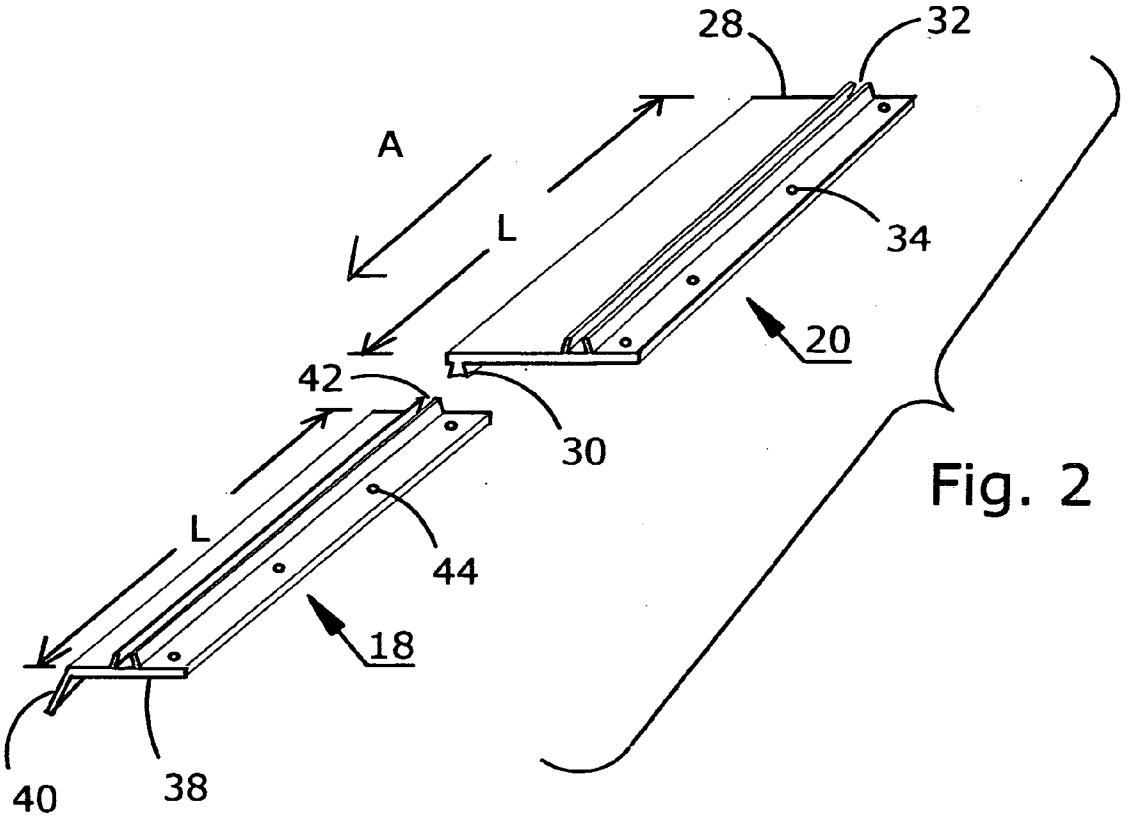


Fig. 2

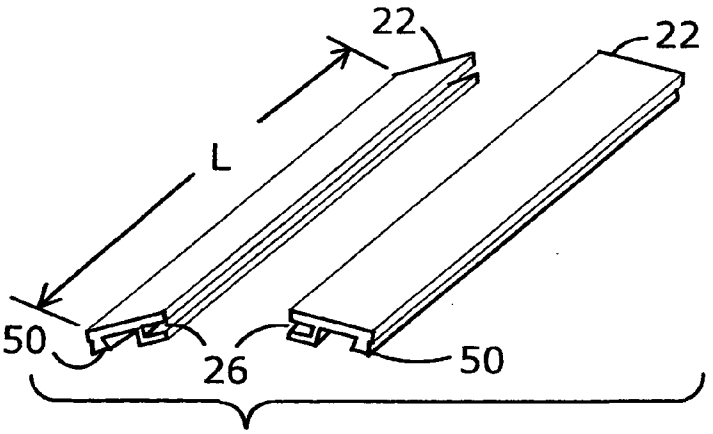


Fig. 3

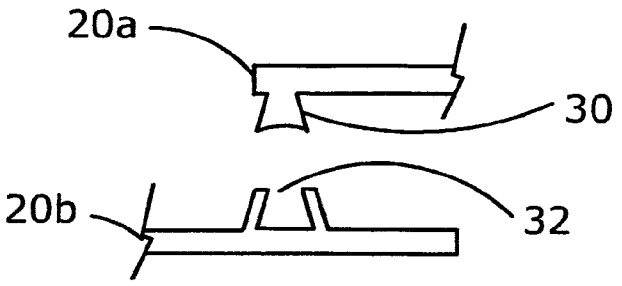


Fig. 4

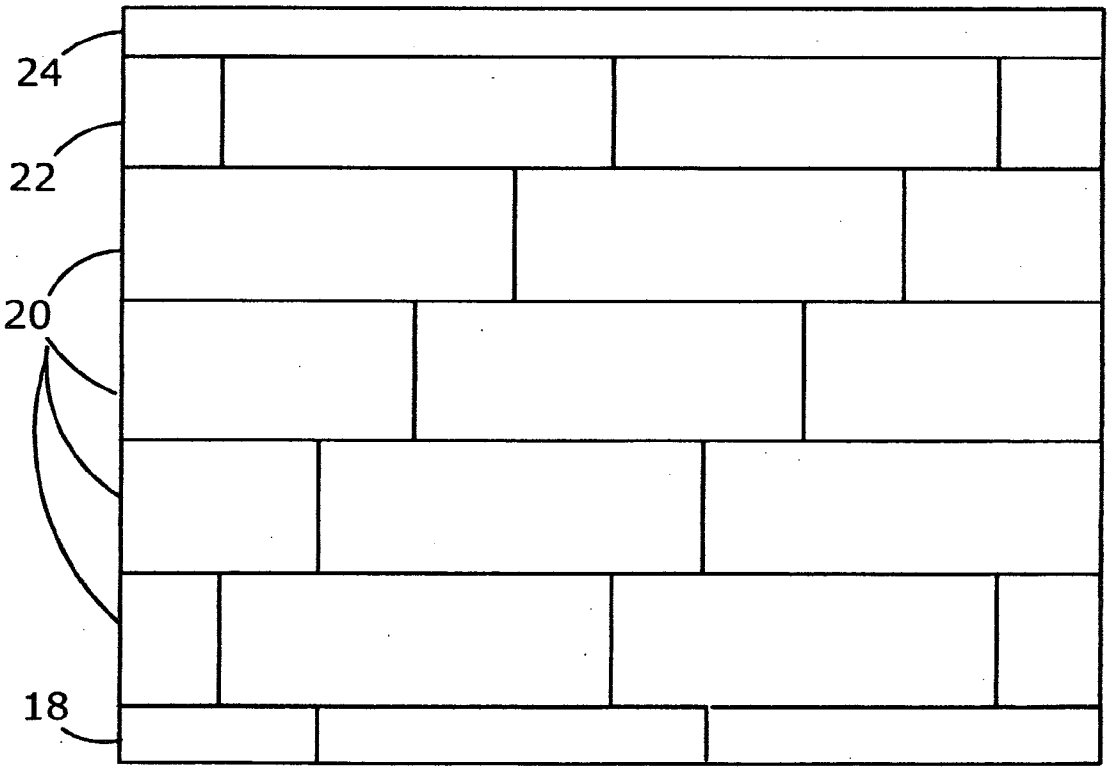


Fig. 5

INTERLOCKING PANEL SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to the field of building materials, and more particularly to a system of exterior building panels for roofing and siding.

BACKGROUND OF THE INVENTION

[0002] Traditionally, exterior roofing and siding building materials have mainly been designed and applied in a manner intended to shed rainwater and keep the building interior dry. The building frame is typically first clad with a sheathing material, e.g. plywood. A barrier layer, e.g. tarpaper or Tyvek® plastic sheeting, is then applied to seal the building against wind and water. Last, a layer of shingles for the roof and lapped siding, e.g. wood planks or vinyl strips, is applied. The outer layer of roofing or siding is applied by starting from the bottom, attaching a first row, and then mounting a second row in a manner for the lower portion of the second row to overlap the upper portion of the first row. With this configuration of lapped exterior panels covering the building frame, rain that falls on the panels runs down to the ground and does not enter the building interior.

[0003] While this traditional building panel system is effective in protecting the building interior from rain and other precipitation, weather systems often involve significant wind. Wind usually blows horizontally and occasionally at various angles, including vertically. In many areas of the world, and especially in recent years, "nor'easters," hurricanes, cyclones, and tornadoes occur. These storms include high velocity wind driven in odd directions. With the changes that have been occurring to the global climate, these storms are more violent and more frequent than in the past. When high velocity wind and water hit a building in a horizontal direction, the lower edge of roof shingles may be lifted and rain is driven into the building. If the wind velocity is high enough, the roof shingles are torn off the building. In extreme cases, wind can remove siding planks from the building frame. The end result is often serious damage to the building and its contents that is upsetting to the inhabitants and costly to repair.

SUMMARY OF THE INVENTION

[0004] The present invention provides an interlocking panel system for buildings that overcomes the drawbacks of the known roofing and siding materials. The invention system includes a series of panels having a tongue along first edge on a first surface and a mating groove along a second edge on a second surface, the second edge being parallel to the first edge. The tongue and groove are configured to engage and disengage by sliding in a direction parallel to the first and second surfaces only, preventing disengagement by lifting in a direction perpendicular to the surface. A series of mounting holes are formed along a line near the second edge to affix the panel to the building frame members, preferably without the need for plywood sheathing. The various configuration of panels of the present invention include an edge panel, a plate panel and a ridge panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present invention is best understood in conjunction with the accompanying drawing figures in which like elements are identified by similar reference numerals and wherein:

[0006] FIG. **1** is a side elevation schematic view of a building frame with a roof formed of panels according to the present invention.

[0007] FIG. **2** is a perspective view of a plate panel of the invention positioned for being engaged with an edge panel of the invention.

[0008] FIG. **3** is a perspective view of a pair of ridge panels of the invention.

[0009] FIG. **4** is a partial end view of an upper panel and a lower panel showing the interlocking tongue and groove of the invention in juxtaposed positions.

[0010] FIG. **5** is a plan view of a building portion with interlocking panels of the invention mounted thereto in staggered configuration.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] Referring now to FIG. **1**, a building frame **10** is illustrated in side elevation view without sheathing sheets, and with the roof enclosed according to the invention. Rafters **12** are mounted at an exemplary angle S. The process of applying the interlocking panel system of the present invention begins by placing an edge panel **18** in contact with the lower end of each rafter set **12** with the downwardly directed flap of each edge panel **18** resting against the angular exposed end of rafters **12**. A series of fasteners F are inserted through holes formed along a line adjacent to the upper edge of each edge panel **18**. A tier of plate panels **20** are interlocked with edge panels **18** as will be described below. A series of fasteners F are inserted through holes formed along a line adjacent to the upper edge of plate panel **20**. Fasteners F are preferably screw fasteners to securely hold edge panel **18** to rafters **12**. Fasteners F may alternatively be adhesive coated nails. As illustrated, plate panels **20** are substantially planar; if the slope S of rafters **12** is relatively steep in comparison to the run R of each plate panel **20**, the upper edge of plate panel **20** may be formed at an upward angle to better accommodate fasteners F. Run R is typically in the range of 6 to 10 inches. Whereas there is no sheathing applied to rafters **12**, workers assembling the panel system of the invention to a building frame are able to install sequential tiers of plate panels **20** while standing on horizontal joists **14**, avoiding the danger of standing on sheathing assembled to sloping rafters **12**. As additional tiers of plate panels **20** are mounted to rafters **12** approaching the peak of the roof, the final tiers must be mounted by roofers positioned on the roof. Finally, ridge panels **22** and ridge flashing **24** are mounted to close the roof surface. As seen, the completed panel system creates a lapped surface covering.

[0012] Referring now to FIG. **2**, an edge panel **18** and a plate panel **20** are depicted in position for being assembled to one another. Edge panel **18** is formed by extrusion with a rectangular planar portion **38** and a rectangular lip portion **40** in angular relation to one another, a concave linear interlocking member such as groove **42** and a series of mounting holes **44**. As noted above, edge panel **18** is mounted to the building rafters **12** (see FIG. **1**) with lip portion **40** in intimate contact with the exposed angular end of each rafter **12** and a series of fasteners inserted through holes **44**. Additional edge panels **18** are mounted to rafters **12** to cover the entire edge of building frame **10** (FIG. **1**). Referring further to FIG. **2**, plate panel **20** is formed with a rectangular planar portion **28**, a convex linear interlocking member such as tongue **30**, a concave linear interlocking member such as groove **32**, and a

series of mounting holes **34**. Holes **34** of plate panel **20** and holes **44** of edge panel **18** are preferably separated from one another by a distance to match conventional building methods, e.g. a spacing between adjacent holes of 8 inches will match commonly used building frame component spacing of 16 or 24 inches. Tongue **30** is positioned adjacent to one edge of plate panel **20** on a lower surface, and groove **32** is positioned adjacent to an opposed edge of plate, panel **20** on an upper surface. As shown, the edge portion of plate panel **20** that is adjacent to tongue **30** extends a minimal distance beyond tongue **30** to reduce the potential lifting effect of a high velocity wind. Tongue **30** of each plate panel **20** is configured to engage and lock into a groove **32** of an adjacent edge panel **18** or sequential plate panel **20**. Therefore, to cover higher sections of rafters **12** (FIG. **1**), a first plate panel **20** is moved laterally in the direction indicated by arrow A to slide tongue **30** of plate panel **20** into engagement with groove **42** of previously mounted mating edge panel **18**, and fasteners are inserted through mounting holes **34**. Whereas tongue **30** is formed on the lower surface and groove **32** is formed on the upper surface of plate panel **20**, plate panel **20** cannot be incorrectly mounted, and mounting holes **34** are always positioned toward the top of the building. Holes **34** are preferably positioned along a line parallel to groove **32**, between groove **32** and the adjacent edge of plate panel **20**. According to known building practice, it is preferred to stagger the edges of successive rows of panels to minimize the chance of water infiltration as will be seen in FIG. **5**. The length L of edge panel **18** is substantially equal to length L of plate panel **20**. Length L is typically in the range of 3 to 6 feet. Depending on the intent of the manufacturer, the panels comprising the present invention may be formed with a uniform thickness throughout or with thinner portions and intermediate longitudinal ribs for rigidity.

[0013] Referring now to FIG. **3**, a pair of ridge panels **22** are illustrated as positioned juxtaposed to one another in substantially the orientation shown in FIG. **1** as they are mounted to a typical roof structure. Ridge panels **22** are made to length L of 3 to 6 feet. Ridge panels **22** are formed with a tongue **50** on lower surfaces and adjacent to an edge thereof. Ridge panels **22** have a channel **26** formed along an opposite edge. Channel **26** is configured for the insertion of a bent or rounded ridge flashing component **24** (see FIG. **1**) or, alternatively a ridge vent, by sliding the component laterally into channels **26**. After a ridge flashing or a ridge vent is put in place, the roof covering is basically complete. To further secure the panels and reduce the chance of water infiltration, the lines of juncture between each adjacent panel may be sealed with caulking compound or similar weather-resistant material.

[0014] Referring now to FIG. **4**, an enlarged partial side elevation of an upper plate panel **20***a* having tongue **30** depending downwardly therefrom and a lower plate panel **20***b* having groove **32** extending upwardly therefrom are illustrated opposed to one another. As depicted, the opening within groove **32** is sized and shaped to snugly and slidingly receive tongue **30**. Tongue **30** and groove **32** are each preferably formed as an equilateral trapezoid in cross sectional view. Alternate shapes for tongue **30** and groove **32**, e.g. circular or "T" shaped, are considered within the scope of the present invention. According to the preferred embodiment of the invention, all panel components described are formed by the process of extrusion. The preferred material for forming the panels described herein is aluminum, although other materials susceptible to extrusion, including other metals and plastic resins, are deemed to be included in the principles of the present invention. With tongue **30** inserted in groove **32** by sliding along their respective lengths, and fastened to the building frame, the assembly is substantially permanent. Removal of any intermediate panel of the present invention involves dismantling the panels from the top of the building surface to the level of the problem panel.

[0015] Referring now to FIG. **5**, a plan view of a portion of a building is shown as covered with the interlocking panel system of the invention. As seen, a first row of edge panels **18** is followed by a number of rows of plate panels **20**. At the upper end, a row of ridge panels **22** is assembled and the covering is completed with a ridge flashing or ridge vent **24**. The common practice of staggering each succeeding row of panels has been employed to avoid continuous aligned joints from the top to the bottom and thus minimize the chance of water infiltration. Whereas the illustrated and described example relates to a roof covering system, the major features of the invention are readily adaptable to exterior vertical wall coverage.

[0016] As described above, the interlocking panel system of the invention provides a series of building exterior panels that are easy to install and is more secure and protective than currently known shingles, planking or extruded vinyl siding.

[0017] While the description above discloses preferred embodiments of the present invention, it is contemplated that numerous variations and modifications of the invention are possible and are considered to be within the scope of the claims that follow.

What is claimed is:

1. An interlocking panel system, comprising:

a. a series of substantially rectangular panels, each having an upper surface, a lower surface, a first edge and a second edge, the second edge residing substantially parallel to the first edge;

b. a first member formed on the upper surface of each panel adjacent to the first edge;

c. a second member formed on the lower surface of each panel adjacent to the second edge; and

d. the second member of each panel configured for lockingly engaging the first member of a mating second panel.

2. The interlocking panel system described in claim **1**, wherein the first member protrudes outwardly from the upper surface and the second member protrudes outwardly from the lower surface.

3. The interlocking panel system described in claim **2**, wherein the first member is concave and the second member is convex in cross section and formed of a size to snugly slide in the first member in a direction substantially parallel to the first and second edges.

4. The interlocking panel system described in claim **3**, wherein the first member is in the shape of an open trapezoid in cross section and the second member is in the shape of a solid trapezoid in cross section.

5. The interlocking panel system described in claim **1**, wherein the planar panel is formed with a series of holes passing transversely therethrough.

6. The interlocking panel system described in claim **5**, wherein the holes are formed along a line that is substantially parallel to the first and second edges.

7. The interlocking panel system described in claim **6**, wherein the line along which the holes are formed is closer to the first linear edge than the first member.

8. The interlocking panel system described in claim **1**, further comprising an edge panel having a first substantially planar portion with an upper surface and a second planar portion oriented at an angle to the first planar portion and a first member formed on the upper surface, wherein the first member is formed to lockingly receive the second member formed on the lower surface of the plate panel.

9. The interlocking panel system described in claim **8**, wherein the first member is in the shape of an open trapezoid in cross section.

10. The interlocking panel system described in claim **8**, wherein the planar portion is formed with a series of holes passing transversely therethrough.

11. The interlocking panel system described in claim **10**, wherein the holes are formed along a line that is substantially parallel to a line of intersection between the first and second planar portions.

12. The interlocking panel system described in claim **11**, wherein the line along which the holes are formed is closer to the first linear edge than the first member.

13. The interlocking panel system described in claim **1**, further comprising a substantially planar ridge panel with a first edge and a second edge, the ridge panel formed with a second member formed parallel and adjacent to the first edge and a channel formed parallel and adjacent to the second edge.

14. The interlocking panel system described in claim **13**, wherein the second member of the ridge panel is configured to lockingly engage the first member of the plate panel.

15. The interlocking panel system described in claim **13**, wherein the channel is configured and positioned to receive a ridge flashing or a ridge vent.

* * * * *