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Kough et al.

[11] **3,785,114**

[45] **Jan. 15, 1974**

[54] **BUILDING PANEL ENCLOSURES FOR VALLEY AND HIP STRUCTURES**

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[73] Assignee: **Ditz-Crane,** San Francisco, Calif.

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[21] Appl. No.: **210,038**

Related U.S. Application Data

[62] Division of Ser. No. 856,235, Aug. 7, 1969, Pat. No. 3,696,570.

[52] **U.S. Cl.** **52/748,** 52/13, 52/533

[51] **Int. Cl.** **E04b 7/06**

[58] **Field of Search** 52/13, 14, 90, 554, 52/555, 560, 748, 533

[56] **References Cited**

UNITED STATES PATENTS

678,995	7/1901	Carnes	52/13
3,095,671	7/1963	Fink et al.	52/560
3,440,777	4/1969	Martin	52/560

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Attorney—Flehr, Hohbach, Test, Albritton & Herbert

[57] **ABSTRACT**

Prefabricated enclosure tip panels and a method of manufacturing the tip panels for enclosing valley and/or hip areas. The tip panel at one longitudinal end is beveled at an angle *a* which angle is dependent upon the relative angle between the two sections at the valley and/or hip joint. The other longitudinal end is adapted for interengagement with a standard panel. A method of manufacturing the tips includes segmenting a standard panel at the angle *a* to form a first valley tip panel and a first hip tip panel. A second standard panel is then segmented at an angle 180°—*a*) to form a second valley tip panel complementary to the first valley tip panel and a second hip tip panel complementary to the first hip tip panel. The tip panel segments are adapted to be joined in combination along the valley line and/or hip line to form a complete valley and/or hip construction and to engage standard panels. A valley flashing may be positioned along the valley center line and extend laterally relative to the center line beneath the valley tip panels to provide a hidden runoff path for water on the roof.

2 Claims, 6 Drawing Figures

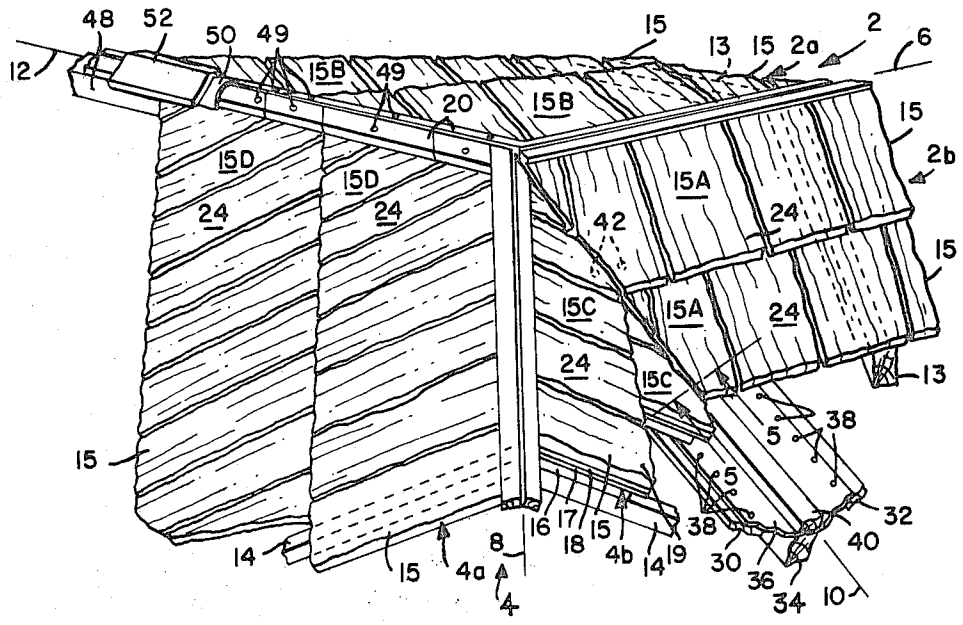

FIG. 1

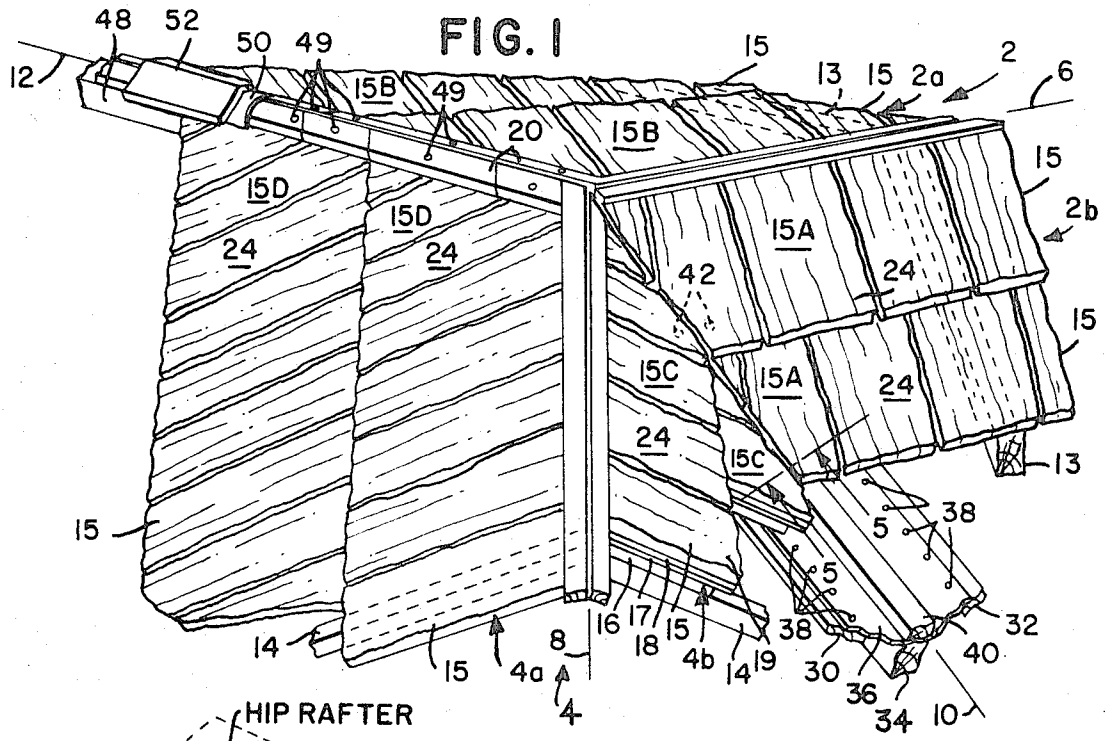

FIG. 1A

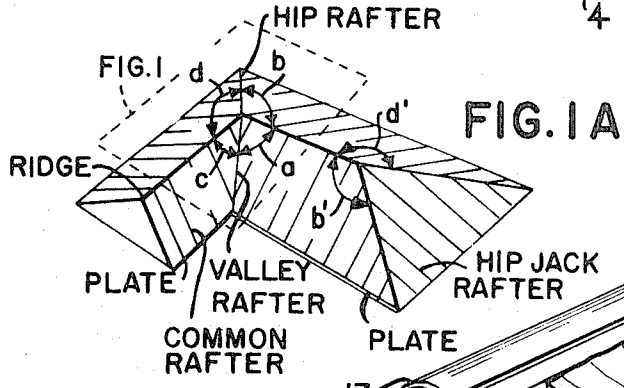

FIG. 2

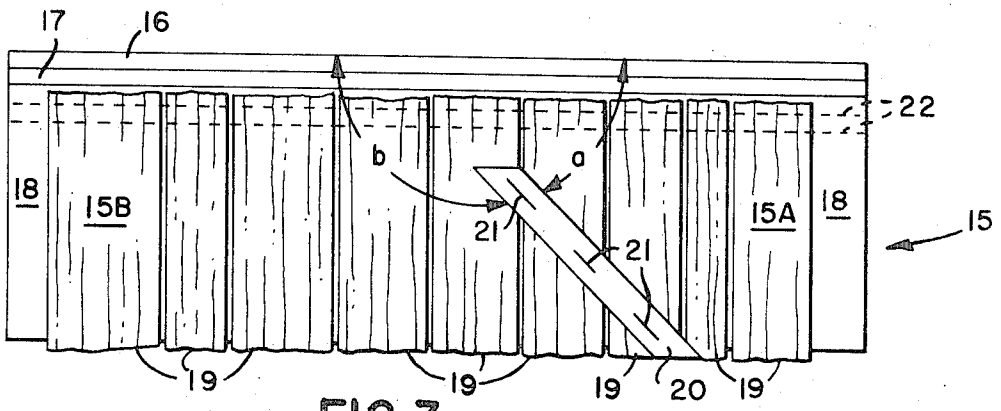

FIG. 3

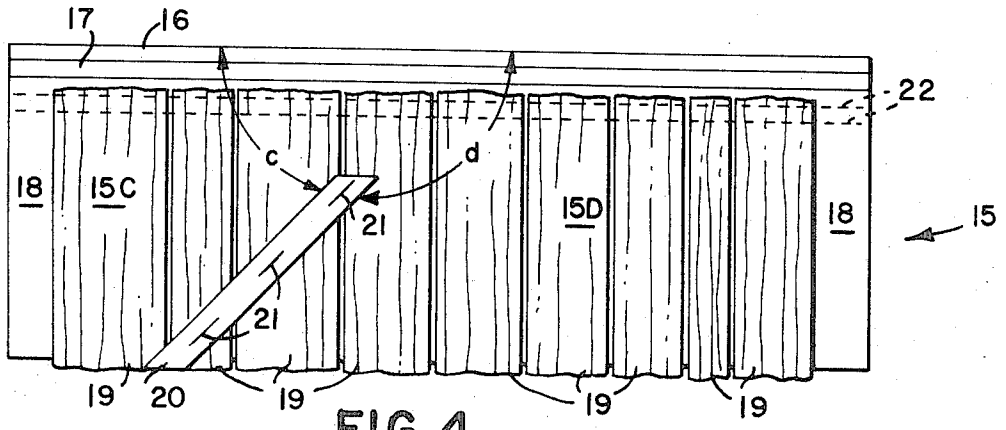

FIG. 4

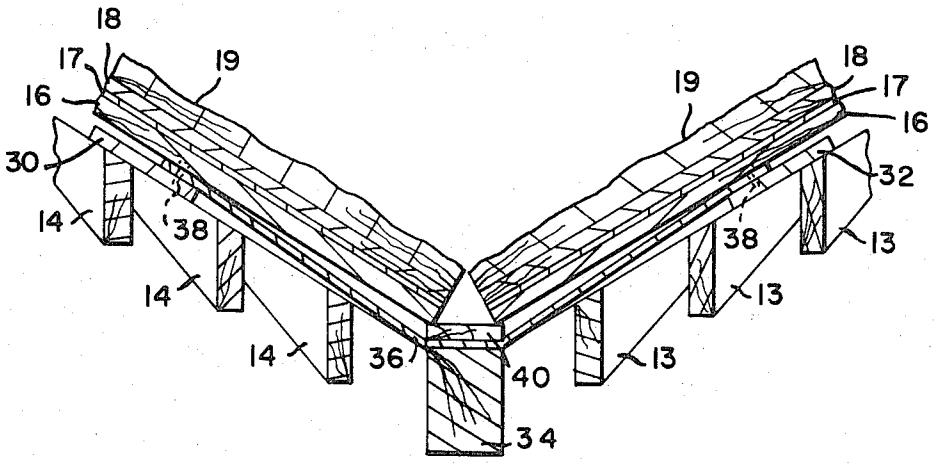

FIG. 5

BUILDING PANEL ENCLOSURES FOR VALLEY AND HIP STRUCTURES

RELATED APPLICATION

This Application is a division of my co-pending application Ser. No. 856,235, filed Aug. 7, 1969, now U.S. Pat. No. 3,696,570 for Building Panel Enclosure For Valley and Hip Structures.

BACKGROUND OF THE INVENTION

This invention relates to prefabricated enclosure panels, incorporating commonly used surfacing materials, for enclosing roof and sides of building structures.

A preferred covering or enclosure material for building exteriors has been shakes applied over a sheathing and waterproofing membrane. Such materials are commonly used for roofing and siding of building structures. A considerable number of prior attempts have been made to provide shake roofing or siding which would avoid some or all of the conventional steps of bundling shakes and shingles, transporting the bundles to the site, applying sheathing, applying waterproof membrane, hoisting the bundles to the roof or scaffold, breaking the bundles and then applying the shakes, one at a time. These numerous steps involve risk of damage to the building materials and considerable installation time and expense. Heretofore, prefabricated panels have been designed overcoming these problems to a substantial degree. Such prefabricated panels have proven highly satisfactory and desirable for applying shake roofing and siding. Such panels are discussed and described in U.S. Pat. No. 3,440,777 granted Apr. 29, 1969 to Otis M. Martin and in U.S. Pat Applications Ser. Nos. 793,865 and 775,731.

Though prefabricated panels are presently in use, it has been found that deficiencies remain in providing panels to enclose hip and valley areas. Such hips and valleys are generated by the intersection of two planes having different relative slope angles. For example, in an L-shape building, when the two roof sections meet there is a valley and/or hip section formed at the point of intersection. In fact, depending on the building layout, there are numerous possible hip and/or valley combinations. A standard panel having a straight terminal edge is not adequate to accommodate the angle at the point of intersection. Accordingly, on-site custom fitting of panels and/or individual shingles is frequently necessary to enclose the valley and hip areas. Also, it is desirable that where valleys are formed that the flashing forming the run-off canal be hidden from view while discouraging undesirable debris from the flashing.

SUMMARY OF THE PRESENT INVENTION

The present invention provides prefabricated enclosure tip panels and a method of manufacturing the tip panels for enclosing valley and/or hip areas about two engaging building structure sections of differing slopes. The teachings enable a shake roof to be built with open valleys or with closed valleys and hidden flashing. The hip and/or valley tip panel segments may be manufactured from standard panels utilized on the same roof section of they can be made as a separate manufactured item. The invention further teaches in manufacturing the tip panels from standard panels, a hip tip panel and a valley tip panel may be generated from a single common standard panel so as to utilize the entire standard panel.

In an exemplary embodiment of the tip panels, a sheathing member, weather membrane and shakes are cut at an angle coinciding with the angle of the hip or valley line. The sheathing member, weather membrane and shakes are secured in combination to form a tip panel with a beveled edge which may be placed in parallel with the hip or valley line. The tip panel is further adapted for standard aligned engagement with a standard horizontally positioned panel on the roof section and for aligned engagement with a vertically positioned panel on the roof section.

In an exemplary method of manufacturing the panel tips, a guide-securing strip of weather resistant wood is placed on top of a standard shake roofing panel. The strip is placed over the shakes at an angle *a* dependent upon the angle of the valley line. The panel is then cut along the edge of the strip. The two resultant sections form a first valley tip panel and a first hip tip panel. A second guide-securing strip is then placed on top of a second shake roofing panel over the shakes at an angle *b* where *b* is in the order of 180° - *a*. The second panel is cut along the edge of the strip to form a second valley tip panel segment and a second hip tip panel segment, respectively, complementary to the first valley tip panel and the first hip tip panel. Accordingly, the area about the hip may be enclosed by joining and securing a plurality of the hip tip panels along the hip line and the valley may be enclosed by joining and securing a plurality of the valley tip panels along the valley line. Each tip panel carries a standard longitudinal terminal end to allow aligned engagement with horizontally positioned standard panels. The guide-securing strips are retained in place to secure the otherwise loose shake segments in place.

In forming a closed valley with hidden flashing, a pair of strip members are secured in place over jack rafters. The strips extend the full length of the valley in parallel with the valley line and laterally from the valley rafter. A valley metal flashing is secured to both strips along the valley over the valley rafter. A center strip is laid on top of the flashing along the valley line. The roof structure may then be built up by placing the beveled ends of the valley tip panels on the center strip and securing the valley tip panels in place. Consequently, as valley tip panels are secured in place along and on both sides of the valley line the flashing is hidden. At the same time, there is provided a spacing intermediate the flashing and the bottom side of the valley tip panels to allow for water run-off.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective, partially sectioned view of a partial enclosed roof of an L-shape building structure forming a valley and a hip and utilizing tip panels in accordance with the teachings of the present invention.

FIG. 1A diagrammatically illustrates roof framing structure including the angle relationship betwen roof ridges, valley lines and hip lines.

FIG. 2 is a perspective view of a tip panel and a standard roofing panel.

FIG. 3 illustrates a top view of a standard panel of FIG. 2 prior to being segmented at a desired angle to form a hip tip panel and a valley tip panel for enclosing the hip and valley areas of FIG. 1.

FIG. 4 is a top view of a standard panel of FIG. 2 prior to being segmented at a desired angle to form a hip tip panel and a valley tip panel segment complementary to the tip panels of FIG. 3.

FIG. 5 illustrates an enlarged cross-sectional view along the line 5—5 of FIG. 1 illustrating the flashing and enclosed valley structure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, FIG. 1A diagrammatically illustrates roof framing with terminology as used in the art. FIG. 1 illustrates in perspective a section of an L-shape building having two gable roof sections, referred to by the general reference characters 2 and 4. The section of FIG. 1 may be viewed as within the broken line block of FIG. 1A. The sections 2 and 4 intersect to form a hip and a valley. The roof section 2 has two subsections 2A and 2B joined at an angle to form a ridge 6. The roof section 4 has two subsections 4A and 4B joined at an angle to form a ridge 8. The roof subsections 2A and 4A come into integral relationship to form a valley having a vertex referred to as a valley line 10. The roof subsections 2A and 4A come into integral relationship to form a hip having a vertex referred to as a hip line 12. FIG. 1A further illustrates the angular relationship between the ridges 6, 8 and line 10, 12. A plurality of rafters 13 extends from the ridge 6 to support the subsections 2A, 2B and a plurality of rafters 14 extends from the ridge 8 to support the subsections 4A, 4B.

Enclosing the roofing structure of the roof sections 2 and 4 may be realized by use of prefabricated roofing enclosure panels 15 of uniform dimensions and select surfacing materials joined in combination. The individual panels 15 illustrated in detail in FIG. 2 are prefabricated to assume a uniform patters such that when in aligned engagement a uniform unitary appearange is provided. The panel 15 includes a base in the form of sheathing member 15, e.g., plywood having superimposed thereon a membrane 17 of felt, asbestos or other waterproof, fireproof or other desired nature. Over the membrane 17 is secured a veneer strip 18 and a plurality of spaced apart shakes 19. The top terminal ends of the veneer strip 18 and the shakes 19 abut a furring strip 20 with the membrane 17 folded back over the strip 20. The furring strip provides for aligned abutting relationship with an upper panel 15. Near the longitudinal ends of the panels 15, the veneer strip 18 is exposed within a void space adapted to receive a shutter shingle after the panels are positioned in alighment on the roofing structure. Panels similar to the panel 15 are described in the aformentioned patent application Ser. No. 793,865. Other panels are described in the aforementioned patent, the other aforementioned patent application and in the patent application of the present inventors entitled, "Panel for Surfacing Buildings," filed concurrently herewith.

As illustrated, the full panels 15 are of rectangular shape with square ends at the longitudinal terminal ends. These panels 15 are not adapted to accommodate the areas about the valley line 10 and the hip line 12 since the vertex lines 10 and 12 are not normal to the associated ridge lines. To accommodate enclosing the roofing structure about the hip and valley lines, enclosure tip panels, having one longitudinal terminal end beveled to coincide with the angle of the valley or hip vertex line is provided. The other longitudinal terminal end is adapted for aligned engagement with a standard panel 15 and the longitudinal running edges are adapted for aligned engagement with other tip enclosure panels or standard panels 15. In FIG. 2, adjacent to the standard panel 15 is depicted a tip enclosure panel 15A adapted to be used to enclose the roofing subsection 2B about the valley line 10. The materials of the tip panel 15A coincide with those of the panel 15 and the dimensions are selected to accommodate aligned engagement with the panels 15. The tip panel 15A includes a sheathing member 16A of the same width and thickness as the sheathing member 16. One longitudinal terminal end of the sheathing member 16 is cut at an angle *a* coinciding with the angle of the ridge 6 to the valley line 10. A membrane 17A is superimposed on the sheathing member 16A which membrane 17A is of the same material as the membrane 17. Over the membrane 17A is secured a veneer strip 18A and a surfacing material in the form of a plurality of spaced apart shakes 19A. The terminal ends of the veneer strip 18A and the shakes 19A abut a furring strip 20A with the membrane 17A folded back over the strip 20A. The membrane 17A, veneer strip 18A and shakes 19A are all cut at the angle *a* to form a valley panel tip which tip will accommodate the valley line and provide aligned engagement with a standard panel as illustrated in FIGS. 1 and 2. The bottom edge of the shakes 19A are all in substantial alignment and the longitudinal edges of the shakes 19A are substantially parallel to one another. As illustrated in FIG. 1, a plurality of the tip panels 15A may be secured along the valley line 10. Similarly, a plurality of valley tip enclosure panels 15C may be formed to complement the tip panels 15A to enclose the subsection 4B about the valley line 10. In this instance, the sheathing membrane, veneer strip and shakes are cut at an angle *c* coinciding with the angle of the ridge 8 and the valley line 10. Similarly, hip tip enclosure panels 15B and 15D may be formed to enclose the subsections 2A and 2B, respectively, about the hip line 12. The hip panel tip 15B may have one longitudinal terminal end assuming an angle *b* coinciding with the angle between the ridge 6 and the hip line 12. The hip panel tip 15D may have one longitudinal terminal end assuming an angle *d* coinciding with the angle between the ridge 8 and the hip line 12. Viewing FIGS. 1 and 2, it may be noted that the tip panels 15A, 15B, 15C and 15D all provide for aligned engagement with standard panels 15 and with adjacent tip panels. The bottom edges of the shakes of the tip panels are all in substantial alignment with the shakes of the panels 15 on the associated roofing subsection to provide a uniform pattern, and the longitudinal running edges of the individual shakes on the tip panels and full panels on the individual subsections 2A, 2B, 4A and 4B are substantially parallel to provide a uniform appearance.

FIGS. 3 and 4 illustrate a method of manufacturing tip panels. FIG. 3 illustrates the standard panel 15 with a guide-secure strip 20 of weather resistant material, e.g., redwood, cedar, etc. stapled across the top of the shakes 19 by a plurality of staples 20 or other acceptable fastening means. A staple 21 is positioned to join each shake 19 intersected by the strip 20. The strip may be in the nature of a lath strip of 3/8 inch × 1½ inches. Relative to the top longitudinal running edge, the strip 20 forms an angle *a* and an angle *b*. The angle *a* is se-

lected to coincide within a common plane the angle formed by the ridge 6 and the valley line 10. Also, in this embodiment, the angle *b* coincides within a common plane the angle formed by the ridge 6 and the hip line 12. The length of the guide-secure strip 20 is selected to extend from the bottom edge of the shakes 19 to a point coinciding with the end of the overlap of a panel placed in vertical alignment when secured to the roofing structure. The panel 15 is then cut along the right edge of the strip 20 to form a panel segment 15A and a panel segment 15B. As illustrated by the two nail lines 22, the shakes 19 of the panel 15 are commonly secured near the top edge such that the overhang of a vertically adjacent panel extends over the nail lines. Consequently, the lower areas of the shakes 19 are not secured. The strip 20 remains with the tip panel 15B and secures the otherwise unsecured shake segments in place while simultaneously functioning as a guide. The segment 15A serves as a first valley tip panel while the segment 15B serves as a first hip tip panel as previously discussed. To form the complementary of the tip panels 15A and 15B a second panel 15 is utilized. As illustrated in FIG. 4, another strip 20 is placed across the second panel 15 to form a pair of angles *c* and *d* relative to the top longitudinal running edge. The strip is secured by staples 21. The angle *c* coincides with the angle within a common plane between the ridge 8 and the valley line 10. Also, in this instance since there is a common hip panel generated with the valley panel, the angle *d* coincides with the angle formed by the ridge 8 and the hip line 12 within a common plane. The second panel 15 is then cut along the strip 20 to form the panels 15C and 15D. The panel 15C serves as a second valley tip panel complementary to the tip panel 15A and the panel 15D serves as a second hip tip panel complementary to the tip panel 15B. Viewing FIG. 1, the various tip panels may be used in combination to enclose the roof structure about the valley line 10 and hip line 12. The tip panels fall in alignment for full panels 15 and may be interengaged with a common shutter shingle 24.

Viewing FIG. 1, while water will run away from the hip line 12 of the enclosed roof, water will run to the valley. Accordingly, it is necessary to provide a trough at the valley to accommodate run-off water. Though open valleys adequately provide for run-off, aesthetically hidden valley structures are more desirable since the flashing is not visible from the exterior. FIGS. 1 and 5 illustrate the structure of the hidden flashing within the closed valley of the present embodiment. The structure includes a pair of lateral support strips 30 and 32, e.g., 1 inch by 6 inches positioned on opposite sides of and parallel to the valley line 10. The strip 30 rests over and is connected to a plurality of rafters 14 of the roofing subsection 4B and the strip 32 rests over and is connected to a plurality of rafters 13 of the roofing subsection 2B. The strips 30 and 32 extend from the bottom edge of the roof subsections 4B and 2B to the ridges 8 and 6 to coincide with the length of the valley. A valley rafter 34 runs along the valley line 10 interconnecting the subsections 2B and 4B. Extending between the strips 30 and 32 and over the top edge surface of the rafter 34 is a metal flashing member 36. The metal flashing member is preferably cut from sheet metal such as copper, galvanized steel or the like and extends the full length of the valley line 10 and the strips 30 and 32. The flahsing 36 is secured to the strips 30 and 32 by standard securing means such as nails 38. The lateral positioning of the strips 30 and 32 may be selected to allow the flashing to extend laterally from the valley line a select distance in accordance with local building codes, e.g., 11 inches. Directly over the flashing 36 and the valley rafter 34 is a center valley strip member 40, e.g., a 2 inches by 4 inches board to form a sandwich type structure with the flashing 36 intermediate the rafter 34 and the strip member 40. The center strip 40 is not nailed in place so as to avoid violating the waterproof integrity of the flashing.

To close the subsection 2B about the valley line 10 a plurality of valley tip panels 15A may be secured to adjacent rafters 13 in vertical alignment from the bottom of the subsection 2B to the ridge 6 with the bevel edge surfaces supported on the center strip 40. The segments 15A may also be secured to the strip 32 within the area adapted to receive a shutter shake and/or along the nailing line 22. To close the subsection 4B about the valley vertex 10 a plurality of valley tip panels 15C may be secured to adjacent jack rafters 14 in vertical alignment from the bottom of the section 4B to the ridge 8 with the bevel edge surfaces supported on the center strip 40. The segment 15C may also be secured to the strip 30 within the area adapted to receive a shutter shingle and/or along the nailing line 22. The panel segments 15A and 15C may be secured to the center strip 40 by nails 42 or other securing means wth the nails 42 positioned within the nailing lines 22. The overhang from the vertically adjacent tip panel extends over the nails 42. Again, the nails 42 preferably do not protrude through the strip member 40. As illustrated, the center strip member 40 supports the panel segments 15A and 15C above the flashing 36 to provide a triangular shaped spacing beneath the tip panels. Accordingly, run-off water is able to seep to the flashing 36 between adjacent tip panels 15A and 15C and run to the bottom of the valley. At the same time, the panels 15A and 15C are in proper position and alignment to engage full panels 15 to complete enclosing of the roofing subsections 2B and 4B.

To close the subsection 2A about the hip line 12 a plurality of hip tip panels 15B are secured to adjacent jack rafters 13 in vertical alignment from the bottom of the subsection 2A to the ridge 6 with the bevel edge surfaces on the hip line 12. To close the subsection 4A about the hip line 12 a plurality of hip tip panels 15D are secured to adjacent jack rafters 14 in vertical alignment from the bottom of the section 4 to the ridge 8 with the bevel edge surfaces on the hip line. The hip panel tips may be secured to a hip rafter 48 by fastening means such as nails 49 extending through the guide-secure strips 20. The guide-secure strips 20 being selected so as to extend from the bottom edge of the shake segments to the edge of the overhang area allows for abutting alignment of the guide-secure strips 20 as vertically adjacent hip tip panels are secured in place. After the subsections 2A and 4A are enclosed, a segment of felt 50 or other membrane material similar to that of the membrane 17 and a plurality of ridge shakes 52 may be secured along the hip line 12 to cover the strips 20. The end result, as depicted in FIG. 1, is a unitary enclosure with the surfacing material (shakes) assuming a uniform pattern.

Accordingly, there is taught herein prefabricated tip panels and method of manufacturing such tip panels to allow for enclosing hip and valley roof sections requir-

ing no or minimal on-site custom fitting. The tip panels are adapted for interengagement with standard panels to provide for rapid and easy installation. At the same time, there is taught a method of providing a closed valley structure in which the flashing is not visible from the exterior. Though the discussion has centered about a method of generating a hip closure panel segment and a valley closure panel segment from a common panel it will also be apparent to those skilled in the art that two valley or hip closure panel segments may be generated from a common panel. For example, viewing the panel of FIG. **3**, the desired segment **15A** or **15B** is retained. Then over the other segment a strip **20** is secured at the desired angle. For example, if the valley tip panels **15A** and **15C** are desired from a common standard panel, the panel **15** of FIG. **3** is severed along the strip **20.** Then over the panel segment **15B** is secured a strip **20** at the angle *c* and then sawn.

I claim:

1. A method of enclosing a roof valley section comprising the steps of: selecting a first tip valley enclosure panel having a beveled edge at an angle coinciding with the angle between the vertex of two intersecting roof sections to be enclosed and the ridge of one of the sections; selecting a second tip valley enclosure panel having a beveled edge at an angle coinciding with the angle formed within a common plane between the vertex and the ridge of the other section; securing the first tip valley panel to the first section with the beveled edge surface parallel to the vertex and securing the second tip valley panel to the second section with the beveled edge surface parallel to the vertex and closely spaced with respect to the beveled edge surface of the first panel; securing beneath the first tip valley panels and to the structure of the first roof section of first side strip extending lateral to and parallel with a valley line formed by the structure of the first and second roof sections; securing beneath the second tip valley panels and to the structure of the second roof section a second side strip extending lateral to and parallel with the valley line; placing intermediate the first and second side strips and beneath the first and second tip valley panels a flashing member and further including the step of positioning a center valley strip member intermediate the flashing and the first and the second tip valley panels along the valley line to space the closely spaced beveled edges of the tip valley panels above the flashing, thereby forming a channel for run-off water which is hidden from view.

2. The method of claim **1** further including the step of securing the first and second tip valley panels to the center valley strip.

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