US 20130180198A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0180198 A1

(43) Pub. Date: Jul. 18, 2013

Olson et al.

(54) SHIPLAP JOINT

(75) Inventors: **Barry D. Olson**, Williamsville, NY (US); **Barton Panagian**, North Tonawanda, NY (US)

(73) Assignee: **E I DU PONT DE NEMOURS AND COMPANY**, Wilmington, DE (US)

(21) Appl. No.: **13/548,272**

(22) Filed: **Jul. 13, 2012**

Related U.S. Application Data

(60) Provisional application No. 61/515,029, filed on Aug. 4, 2011.

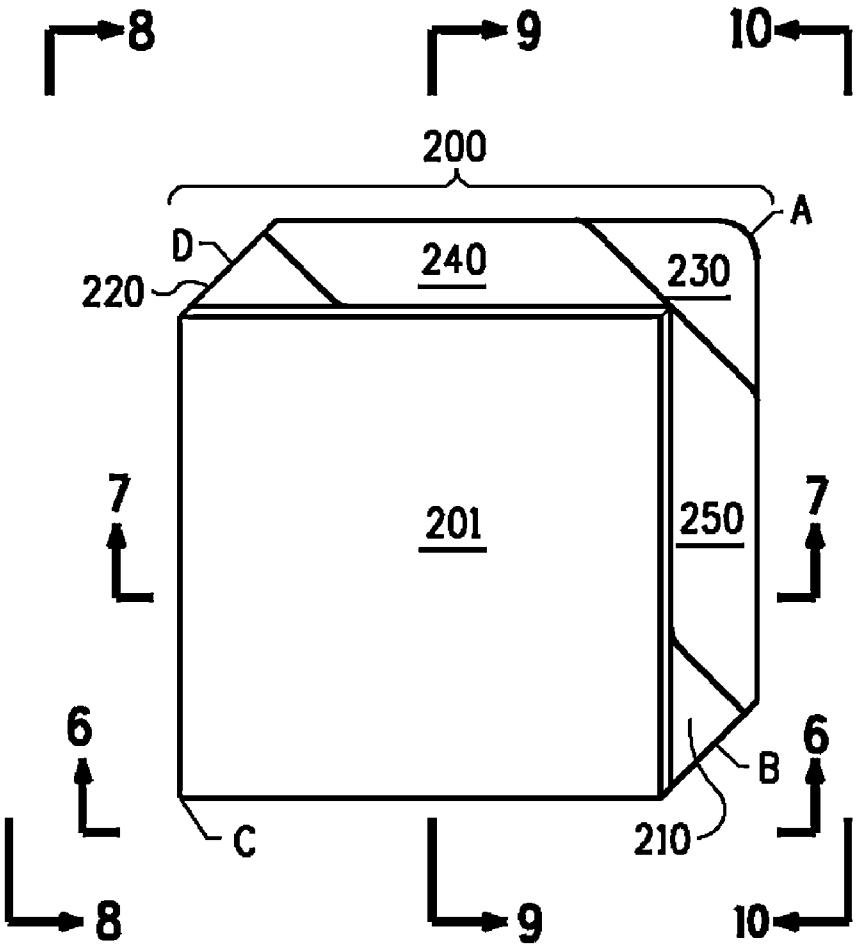
Publication Classification

(51) **Int. Cl.**
E04F 13/08 (2006.01)

(52) **U.S. Cl.**
CPC *E04F 13/0889* (2013.01)
USPC **52/591.4**

(57) **ABSTRACT**

A building panel having improved shiplap joints to provide complete coverage with while providing for panel expansion and contraction. The building panel includes an overlap adapted to overlie a back portion of the backface of one or more panels laid up in the next higher course. Alternate corners of the building panels have centerlaps portions formed at a plane central to the thickness of the building panel that fit between the space defined by the front overlap and the back-underlap. The centerlaps mate to fill gaps that would otherwise open when the building panels expand and contract.



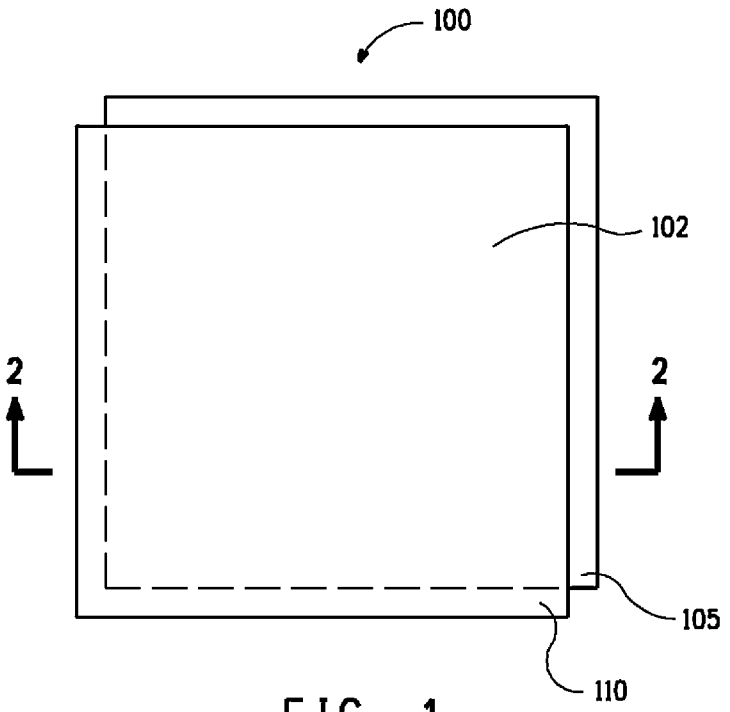


FIG. 1
(Prior Art)

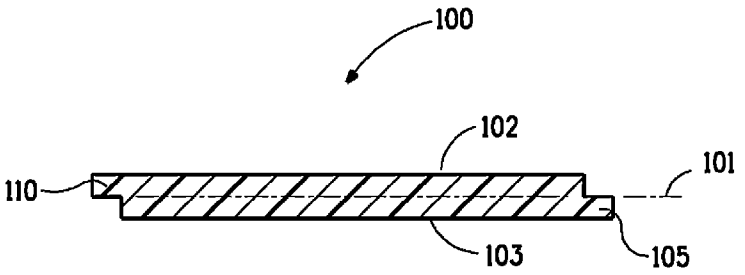


FIG. 2
(Prior Art)

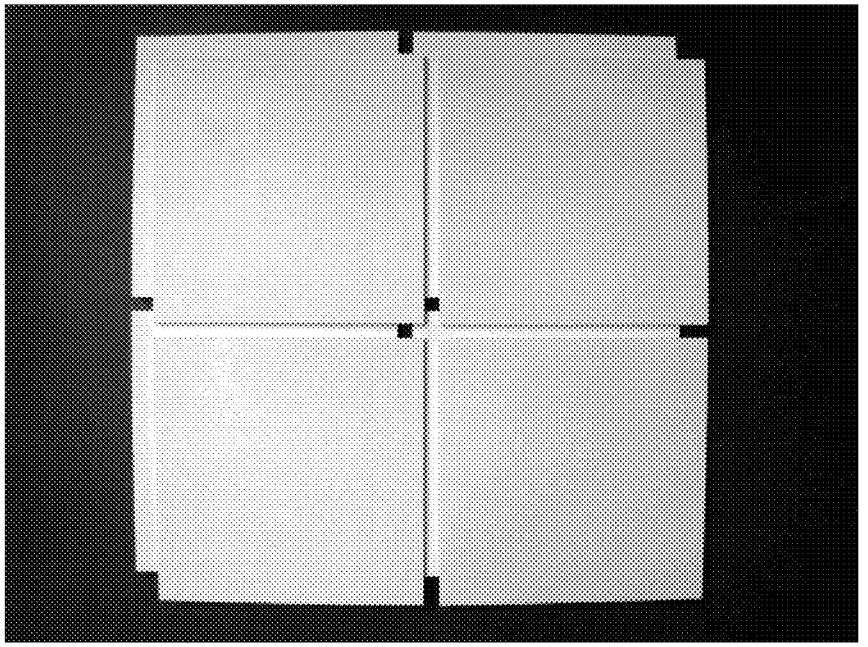


FIG. 3

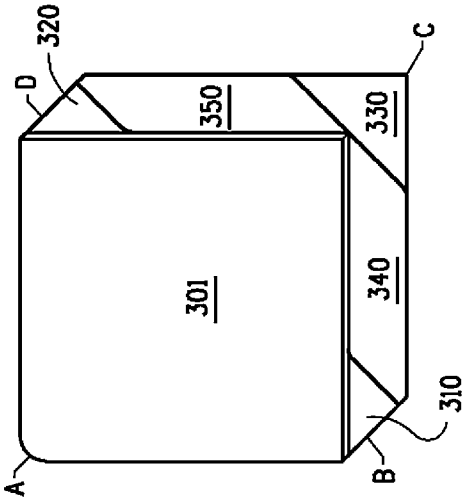

320
D
C
350
330
301
340
310
A
B

FIG. 5

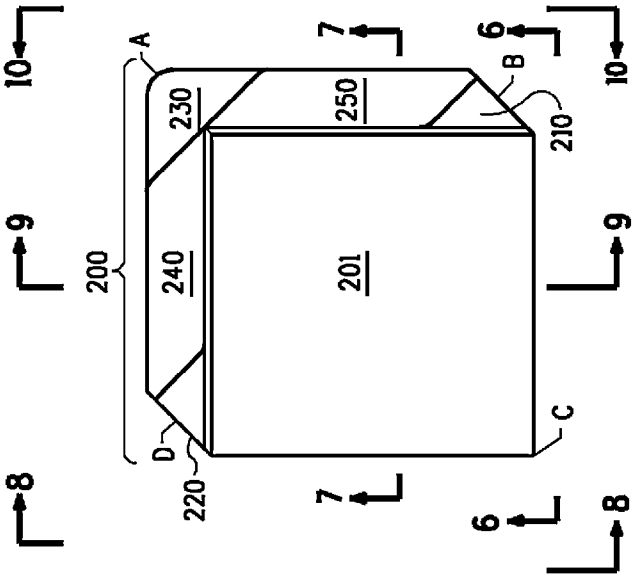

10
A
7
6
B
10
230
250
210
9
200
240
201
9
D
C
220
8
7
6
8

FIG. 4

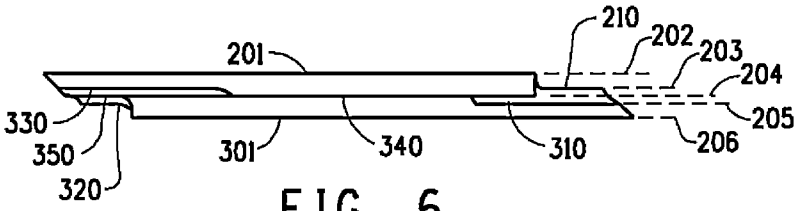


FIG. 6

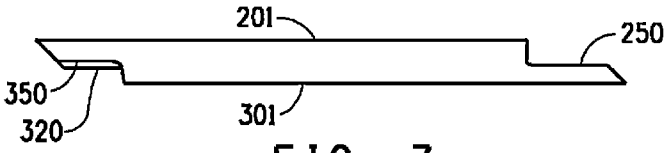


FIG. 7

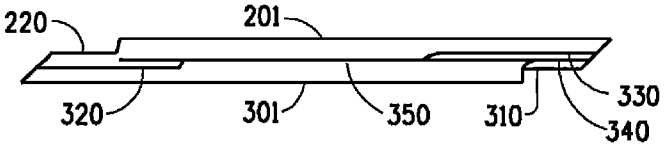


FIG. 8

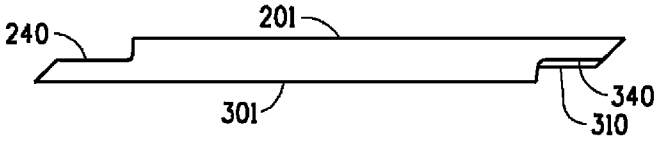


FIG. 9

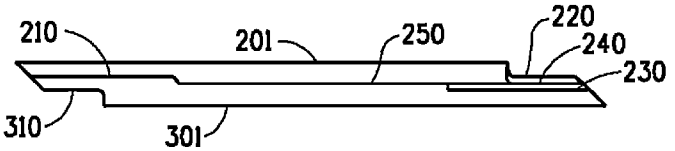


FIG. 10

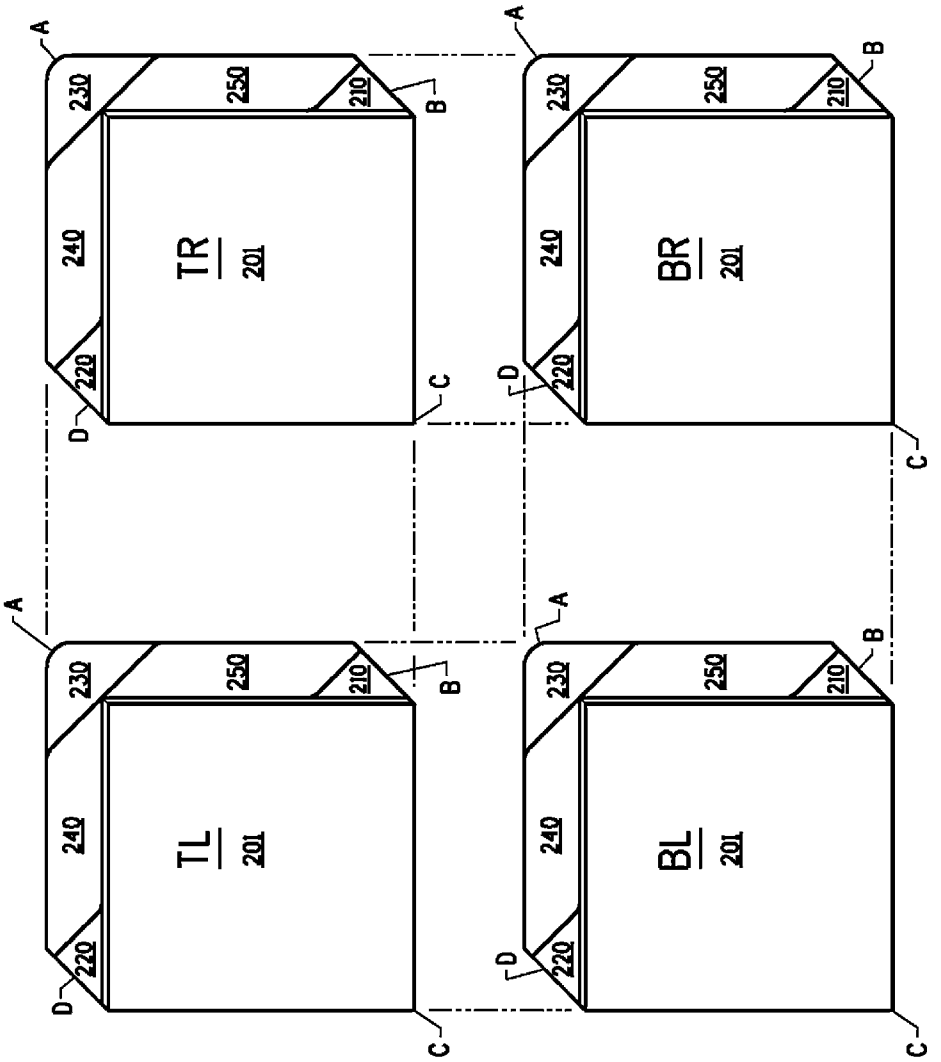


FIG. 11

FIG. 12A

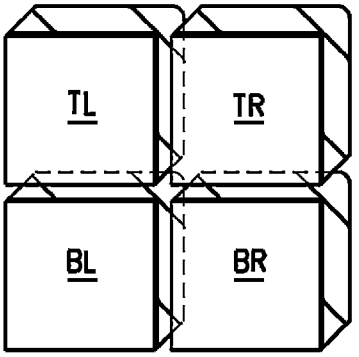


FIG. 12B

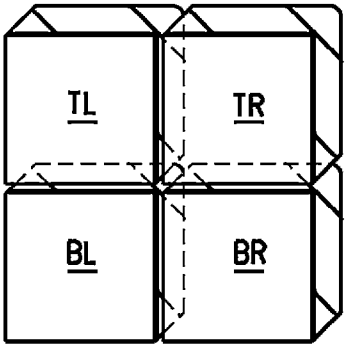
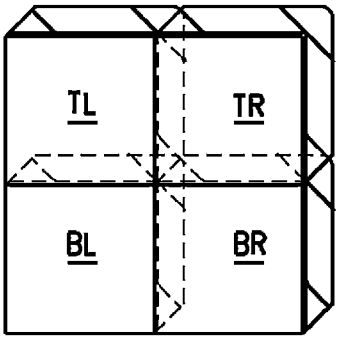


FIG. 12C



SHIPLAP JOINT

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention

[0002] The present invention relates to building panels particularly suitable for use as exterior siding on building wall surfaces.

[0003] 2. Description of the Related Art

[0004] In constructing exterior walls of a building, it is known to fasten building panels to a building frame using fasteners or adhesives. Daily and yearly climatic changes require that the building panels have means for expansion and contraction. It is known to use various filler materials such as grout, silicone and recessed filler strips, e.g., metal strips of matching color to resiliently fill the gap between adjacent building panels. Filler materials have the disadvantage of requiring additional labor during application and eventual replacement as the material weathers due to exposure to the elements.

[0005] It is also known to use shiplap boards which use shiplap joints to clad the side of a building. Shiplap joints are typically formed by cutting matching rabbets into opposite faces of adjoining boards. A rabbet is cut along an edge of one board on a frontface surface and the adjacent board is cut with a rabbet on the backface. The depth of the rabbet cuts are made so the adjacent panels can be positioned next to each other and the overlap and underlap edges of the adjacent boards mate together. This produces a shiplap joint that prevents gaps from forming between the boards as they expand and contract. As illustrated in FIG. **1** and FIG. **2**, panels can also use shiplap joints by extending the rabbet cuts on all four panel edges to mate with adjacent panels to create near complete coverage. However, gaps will develop in the coverage when the panels experience contraction, as illustrated in FIG. **3**., which shows the four corner intersection of four identical panels. The two black squares near the four-corner intersection of the assembly of four panels depict gaps in the coverage. Due to these gaps, additional recessed material, e.g., metal strips of matching color, or another means is still needed to provide gapless coverage. There is a need for a shiplap panels that do not expose gaps in the coverage when the panels undergo expansion and contraction.

SUMMARY OF THE INVENTION

[0006] An improved shiplap building panel having four corners and four edges, a first corner with a backunderlap (**230**), a first edge (DA) with a backlap (**240**), a second corner (B) with a backcenterlap (**210**) and a frontcenterlap (**310**), a second edge (AB) with a backlap (**250**), a third corner (C) with a frontunderlap (**330**), a third edge (BC) with a frontlap (**340**), a fourth corner (D) with a backcenterlap (**220**) and a frontcenterlap (**320**), a fourth edge (CD) with a frontlap (**350**), a front face (**201**), and a back face (**301**) such that when the improved shiplap building panels are assembled with the same orientation the panels overlap and there no visible gaps between panels and panels are free to expand and contract with temperature changes without forming any gaps among panels.

DEFINITIONS

[0007] The following terms provide descriptions of planes and surfaces with dimensions that if exceeded would result in two adjacent panels attempting to occupy the same space. The dimensions could be smaller to allow for manufacturing tolerances.

[0008] The term "frontface" (**102**, **201**) is used to distinguish a first face of a building panel from the second face of a building panel. The frontface is that face of the building panel which is exposed to view. It is opposite to the backface of a building panel.

[0009] The term "backface" (**103**, **301**) is used to distinguish a second face of a building panel from a first side of the building panel. The backface is the face of the building panel which is fastened to a wall of a building. It is opposite to the frontface of a building panel.

[0010] The term "plane of the frontface" (**202**) herein refers to the flat surface of the frontface (**201**) and on which a straight line joining any two points on it would wholly lie.

[0011] The term "plane of the backcenterlap" (**203**) herein refers to a flat surface that is located between the plane of the frontface and the plane of the backface and on which a straight line joining any two points on it would wholly lie. It is located closer to the frontface (**201**) than the backface (**301**).

[0012] The term "plane of the centerline" (**204**) herein refers to a flat surface that is located centrally between the plane of the frontface (**202**) and the plane of the backface (**206**) and on which a straight line joining any two points on it would wholly lie. It is also located centrally to the plane of the front centerlap (**203**) and the plane of the back centerlap (**205**).

[0013] The term "plane of the frontcenterlap" (**205**) herein refers to a flat surface that is located between the plane of the frontface and the plane of the backface and on which a straight line joining any two points on it would wholly lie. It is located closer to the backface (**301**) than the frontface (**201**).

[0014] The term "plane of the backface" (**206**) herein refers to the flat surface of the backface (**301**) and on which a straight line joining any two points on it would wholly lie.

[0015] The term "overlap" herein refers to a projection from the frontface of a shiplap building panel that remains after a rabbet is cut from the backface. The overlap of the present invention is illustrated in FIG. **5** and comprises all of the centerlap (**310**, **320**), frontlap (**340**, **350**) and frontoverlap (**330**) elements. For purposes of this invention, the overlap of the present invention, as depicted in the figures, will be referred to as (**310-350**). The overlap of the prior art is illustrated in FIG. **1** and FIG. **2** as (**110**).

[0016] The term "underlap" herein refers to a projection from the backface of a shiplap building panel that remains after a rabbet is cut from the frontface. The underlap of the present invention is illustrated in FIG. **4** and comprises all of the centerlap (**210**, **220**), backlap (**240**, **250**) and backunderlap (**230**) elements. For purposes of this invention, the underlap of the present invention, as depicted in the figures, will be referred to as (**210-250**). The underlap of the prior art is illustrated in FIG. **1** and FIG. **2** as (**105**).

[0017] The term "backcenterlap" (**210**, **220**) herein refers to a projection from an edge of the building panel that is shared by the overlap (**310-350**) and underlap (**210-250**) but does not extend from either the frontface (**201**) or the backface (**301**). It has a first surface at the plane of the front centerlap (**203**), half of the backcenterlap merges with the backlap (**250**, **240**) and the other half has a second surface at the plane of the backcenterlap (**205**) and forms a portion of the

surface of the "frontcenterlap" (**310**, **320**). A first backcenterlap (**310**) is located in the figures at corner B and a second backcenterlap (**320**) is located in the figures at corner D.

[0018] The term "backlap" (**240**, **250**) herein refers to portion of the underlap (**210-250**) that extends from the plane of the backface (**206**) to the plane of the centerline (**204**).

[0019] The term "backunderlap" (**230**) herein refers to portion of the underlap (**210-250**) that extends from the plane of the backface (**206**) to the plane of the back centerlap (**205**). The backunderlap is located in the figures at corner A.

[0020] The term "frontlap" (**340**, **350**) herein refers to portion of the overlap (**310-350**) that extends from the plane of the frontface (**202**) to the plane of the centerline (**204**).

[0021] The term "frontoverlap" (**330**) herein refers to portion of the underlap (**310-350**) that extends from the plane of the backface (**206**) to the plane of the front centerlap (**203**). The frontoverlap is located in the figures at corner C.

[0022] The term "frontcenterlap" (**310**, **320**) herein refers to a projection from an edge of the building panel that is shared by the underlap (**210-250**) and overlap (**310-350**) but does not extend from either the backface (**301**) or the frontface (**201**). It has a first surface at the plane of the back centerlap (**205**), half of the frontcenterlap merges with the frontlap (**350**, **340**), and the other half has a second surface at the plane of the frontcenterlap (**203**) and forms a portion of the surface of the "backcenterlap" (**210**, **220**). A first frontcenterlap (**210**) is located in the figures at corner B, and a second frontcenterlap (**220**) is located in the figures at corner D.

[0023] The term "improved shiplap joint" herein refers to matching shiplap joints as described by the present invention.

[0024] The term "improved shiplap building panel" herein refers to building panels with the improved shiplap joints as described by the present invention.

[0025] For purposes of this invention, edges of the improved shiplap panel may be designated by the corners at the end of the edge. As shown in FIG. **5**, for example, the edge that extends from corner A to corner B is designated as edge AB.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] FIG. **1** illustrates a prior art shiplap panel from a plan perspective.

[0027] FIG. **2** illustrates a prior art shiplap panel from an edge perspective.

[0028] FIG. **3** illustrates an assembly of prior art shiplap panels.

[0029] FIG. **4** illustrates a plan view of a frontface of an improved shiplap panel.

[0030] FIG. **5** illustrates a plan view of a backface of an improved shiplap panel.

[0031] FIG. **6** illustrates an overlap edge of an improved shiplap panel.

[0032] FIG. **7** illustrates a cross sectional view of an improved shiplap panel.

[0033] FIG. **8** illustrates a second overlap edge of an improved shiplap panel.

[0034] FIG. **9** illustrates a cross sectional view of an improved shiplap panel.

[0035] FIG. **10** illustrates an underlap edge of an improved shiplap panel.

[0036] FIG. **11** illustrates an exploded view of an assembly of improved shiplap panels.

[0037] FIGS. **12**A-C illustrate 3 views of an assembly of improved shiplap panels in various stages of expansion and contraction.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0038] The subject invention is a building panel with an improved shiplap joint that eliminates the coverage gaps at the corner intersection of building panels. The building panel includes a first face known as a frontface (**201**) which is exposed to view after installation on the building, which includes an overlap (**210-350**) portion adapted to overlay the underlap (**210-250**) of a second face known as backface (**301**) of one or more improved shiplap building panels laid up in the next higher course of a building wall surface. Prior art shiplap joints use an overlay (**110**) and underlay (**105**) that typically mate along the plane of a centerline (**101**) of the panel. The improved shiplap joint uses backcenterlaps (**210**, **220**) and frontcenterlaps (**310**, **320**) formed along a third plane, or thickness, of material at a center plane of building panels which straddle the plane of the centerline (**204**). Each pair of backcenterlaps (**210**, **220**) and frontcenterlaps (**310**, **320**) are located at diagonally opposite corners of the improved shiplap building panel, while each front/back pair (**210**, **310**) and (**220**, **320**) are located in the same corner, but rotated 90 degrees relative to each other. FIG. **4** illustrates the backcenterlap (**210**, **220**) features on opposite panel corners, and FIG. **5** illustrates the frontcenterlap (**310**, **320**) features. Due to the rotation of each front/back centerlap pair (**210**, **310** and (**220**, **320**) half of each pair can be defined as having a first surface of the centerlaps along the plane of the backcenterlap (**203**), and a second surface along plane of the frontcenterlap (**205**). The second half of each centerlap merges with the underlying frontlaps (**310** into **340**, **320** into **350**) and back laps (**210** into **250**, **220** into **240**). The centerlaps are located on opposite corners of the panel at the ends which are shared by the overlap (**310-350**) and the underlap (**210-250**).

[0039] The overlap (**310-350**) and underlap (**210-250**) must be thinner at the corners to accommodate for mating with the center plane thickness of the backcenterlaps (**210**, **220**) and frontcenterlaps (**310**, **320**). The backunderlap (**230**) is a thinner section of the underlap with a thickness defined by the plane of the backface (**206**) and the plane of the frontcenterlap (**205**). The backunderlap is located at the corner shared by the backlaps (**240**, **250**).

[0040] FIG. **11** depicts an assembly of four identical improved shiplap panels. It should be noted that in the descriptions of the overlaps and intersection that follow, reference should be made to both FIG. **4** and FIG. **5** as depicting, respectively, front face and back face of the panels. Additional panels of the same design would align in the same manner as described. The four panels are aligned such that Corner A of the Bottom Left Panel (BL) meets with Corner B of the Top Left Panel (TL), Corner C of the Top Right Panel (TR), and Corner D of the Bottom Right Panel (BR).

[0041] Description of Overlaps of Panels BL and BR

[0042] When installed, the side connecting Corners A and B, or Side AB, of Panel BL meets Side CD of Panel BR in such a manner that frontlap (**350**) of Panel BR mates with backlap (**250**) of panel BL at the plane of the centerline (**204**). At the meeting of Corner B of panel BL and Corner C of panel BR the upper left half of frontoverlap (**330**) of panel BR mates with backcenterlap (**210**) of panel BL at the plane of the backcenterlap (**203**). At the meeting of Corner A of panel BL

and Corner D of panel BR the frontcenterlap (**320**) of panel BR mates with the lower right half of backunderlap (**230**) of panel BL at the plane of the frontcenterlap (**205**).

[0043] Description of Overlaps of Panels BL and TL

[0044] When installed, the side connecting Corners D and A, or Side DA, of Panel BL meets Side BC of Panel TL in such a manner that frontlap (**340**) of Panel TL mates with backlap (**240**) of panel BL at the plane of the centerline (**204**). At the meeting of Corner D of panel BL and Corner C of panel TL the lower right half of frontoverlap (**330**) of panel TL mates with backcenterlap (**220**) of panel BL at the plane of the backcenterlap (**203**). At the meeting of Corner A of panel BL and Corner B of panel TL the frontcenterlap (**310**) of panel TL mates with the upper left half of backunderlap (**230**) of panel BL at the plane of the frontcenterlap (**205**).

[0045] Description of Overlaps of Panels TL and TR

[0046] When installed, the side connecting Corners A and B, or Side AB, of Panel TL meets Side CD of Panel TR in such a manner that frontlap (**350**) of Panel BR mates with backlap (**250**) of panel TL at the plane of the centerline (**204**). At the meeting of Corner B of panel TL and Corner C of panel TR the upper left half of frontoverlap (**330**) of panel TR mates with backcenterlap (**210**) of panel TL at the plane of the backcenterlap (**203**). At the meeting of Corner A of panel TL and Corner D of panel TR the frontcenterlap (**320**) of panel TR mates with the lower right half of backunderlap (**230**) of panel TL at the plane of the frontcenterlap (**205**).

[0047] Description of Overlaps of Panels TR and BR

[0048] When installed, the side connecting Corners D and A, or Side DA, of Panel BR meets Side BC of Panel TR in such a manner that frontlap (**340**) of Panel TR mates with backlap (**240**) of panel BR at the plane of the centerline (**204**). At the meeting of Corner D of panel BR and Corner C of panel TR the lower right half of frontoverlap (**330**) of panel TR mates with backcenterlap (**220**) of panel BR at the plane of the backcenterlap (**203**). At the meeting of Corner A of panel BR and Corner B of panel TR the frontcenterlap (**310**) of panel TR mates with the upper left half of backunderlap (**230**) of panel BR at the plane of the frontcenterlap (**205**).

[0049] Description of Intersection of the Four Panels where they Meet

[0050] The bottommost layer is backunderlap (**230**) of panel BL. The lower right half of backunderlap (**230**) of panel BL is mated with frontcenterlap (**320**) of panel BR at the plane of the frontcenterlap (**205**). The upper left half of backunderlap (**230**) of panel BL is mated with frontcenterlap (**310**) of panel TL at the plane of the frontcenterlap (**205**). The backcenterlap (**210**) of panel TL and backcenterlap (**220**) of panel BR then mate with the topmost layer frontoverlap (**330**) of panel TR, mating with the top left and bottom right halves respectively at the plane of the backcenterlap (**202**). It is this overlapping system of three layers (bottom (**230**), middle (**310** and **320**), and top (**330**) that meet at two planes (lower (**205**) and upper (**203**)) that allow panels to expand and contract without creating visible gaps in the assembly.

[0051] FIG. **11** in contrast to the prior art depicted in FIG. **3** shows the elimination of the coverage gaps at the four-corner intersection.

[0052] The improved shiplap building panel of the present invention is not limited by the material of construction. It is found that by utilizing a material that is easy to cut with high speed router bits and a material with consistent color throughout its thickness, the geometry outlined above can be quickly and easily integrated into exterior cladding façade panels for complete homogenous material coverage. Solid surface materials are found preferable. Corian® solid surface materials from E.I. du Pont de Nemours and Company, Wilmington, Del. are examples.

[0053] Optionally, all edges may be beveled to facilitate drainage of rainwater, dew, or the like.

[0054] Optionally, the improved shiplap building panel may be designed such that all cuts may be made with a single tool, such as a router bit or a shaper bit. It is found most preferable to use a cutter with a 15 degree angle with a radius on the end. The process for using the cutter uses two steps, one to cut a first face, then the panel is flipped and a second face is cut.

[0055] The improved shiplap building panel is installed according to typical shingle siding technique wherein a first course of improved shiplap building panels are fastened along the bottom of the building with the underlap (**210**-**250**) at the top. Successive courses of shingles are fastened above the previous course.

What is claimed is:

1. An improved shiplap building panel, said building panel having two opposing faces, four edges and four corners comprising,

(a) a first corner (A) with a backunderlap (**230**),
(b) a first edge (DA) with a backlap (**240**),
(c) a second corner (B) with a backcenterlap (**210**) and a frontcenterlap (**310**),
(d) a second edge (AB) with a backlap (**250**),
(e) a third corner (C) with a frontunderlap (**330**),
(f) a third edge (BC) with a frontlap (**340**),
(g) a fourth corner (D) with a backcenterlap (**220**) and a frontcenterlap (**320**),
(h) a fourth edge (CD) with a frontlap (**350**),
(i) a front face (**201**), and
(j) a back face (**301**)

such that when the improved shiplap building panels are assembled with the same orientation the panels overlap and there no visible gaps between panels and panels are free to expand and contract.

2. The improved shiplap building panel of claim **1**, wherein all edges are beveled to facilitate drainage.

3. The improved shiplap building panel of claim **1**, designed such that all cuts may be made with a single tool.

4. The improved shiplap building panel of claim **1**, wherein all inside corners have a fillet with a radius that provides additional strength and crack resistance.

* * * * *