Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2484792 C 2009/12/08

(11)(21) **2 484 792**

(12) **BREVET CANADIEN**
CANADIAN PATENT

(13) **C**

(22) Date de dépôt/Filing Date: 2004/10/14

(41) Mise à la disp. pub./Open to Public Insp.: 2005/04/15

(45) Date de délivrance/Issue Date: 2009/12/08

(30) Priorité/Priority: 2003/10/15 (US60/511,527)

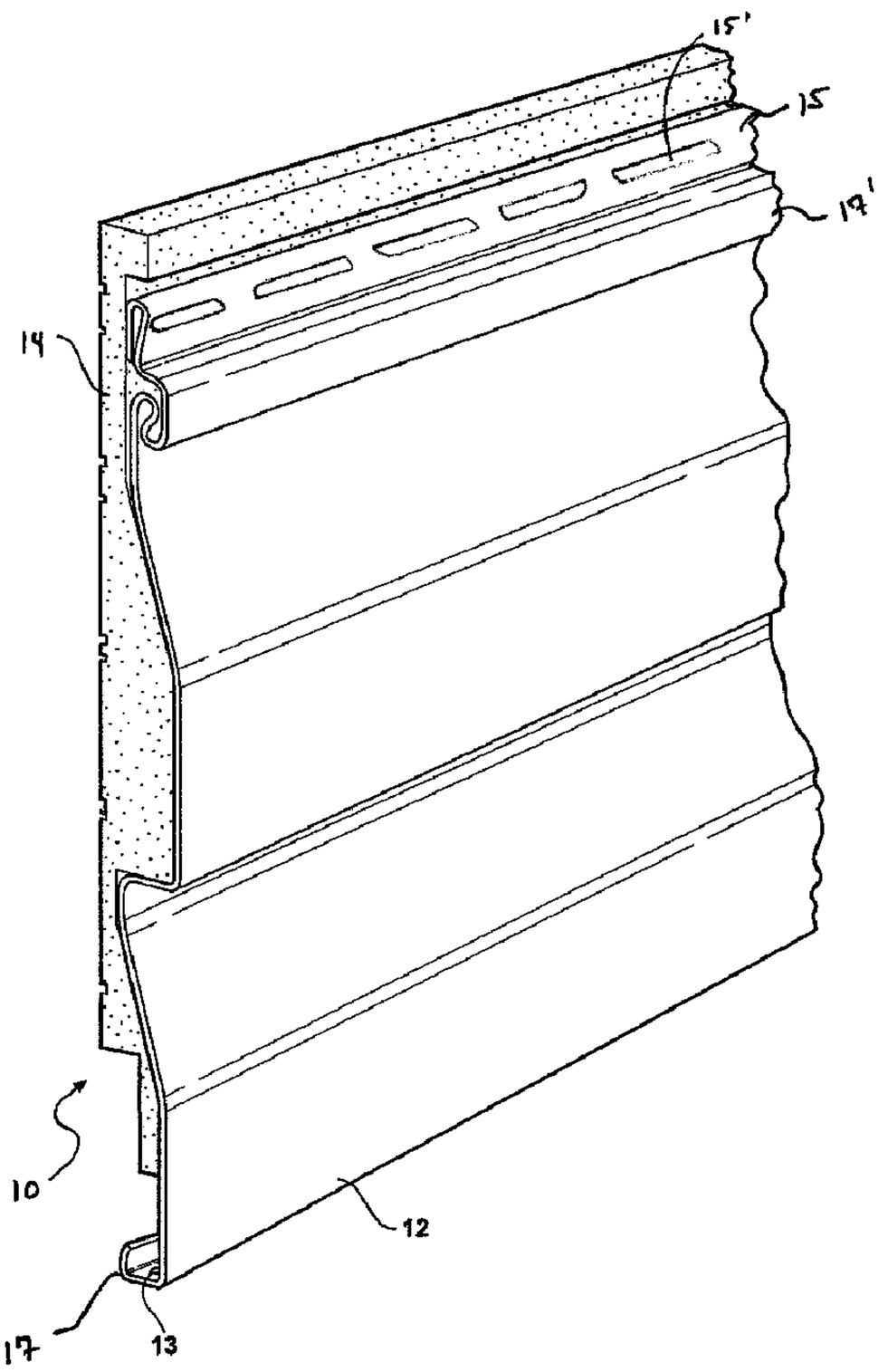
(51) Cl.Int./Int.Cl. *E04F 13/00* (2006.01),
E04B 1/62 (2006.01)

(72) Inventeurs/Inventors:
WILSON, RICHARD C., US;
CULPEPPER, PATRICK M., US

(73) Propriétaire/Owner:
PROGRESSIVE FOAM TECHNOLOGIES, INC., US

(74) Agent: SIM & MCBURNEY

(54) Titre : PLAN D'ECOULEMENT DES EAUX POUR PRODUIT DE CONSTRUCTION DE MUR EXTERIEUR
(54) Title: DRAINAGE PLANE FOR EXTERIOR WALL PRODUCT



(57) Abrégé/Abstract:
An apparatus and method for a drainage system of an exterior wall of a building comprising insulation having a rear face for contact with the exterior wall of the building and a drainage plane positioned on the rear face for removal of water from the exterior wall.

ABSTRACT OF THE DISCLOSURE

[0024] An apparatus and method for a drainage system of an exterior wall of a building comprising insulation having a rear face for contact with the exterior wall of the building and a drainage plane positioned on the rear face for removal of water from the exterior wall.

DRAINAGE PLANE FOR EXTERIOR WALL PRODUCT

FIELD OF THE INVENTION

[0002] The present invention relates to a siding panel for an exterior wall of a building. In particular, the invention provides for a drainage plane positioned on the rear face of a contoured foam backer used with siding products. The drainage plane allows water to more efficiently dissipate from the exterior wall.

BACKGROUND OF THE INVENTION

[0003] The construction industry, both new construction and remodeling, is increasingly confronted with problems associated with the buildup of moisture on surfaces within exterior walls. This moisture buildup may cause various types of mold, including black mold. Such mold is frequently blamed for causing serious respiratory illnesses and numerous other health conditions in both humans and animals. Individuals often go to great expense to remove mold from their homes, and in extreme cases walls and even entire structures are torn down.

[0004] Building codes have long required that exterior walls be permeable so that moisture can escape if such moisture finds its way into the wall. However, on occasion due to poor insulation, inadequate flashing, leaking pipes or bad building practices, water can nonetheless find its way into exterior walls. In some cases water can be found in such large quantities that it overwhelms the exterior wall system. In other words, the exterior wall material simply cannot dissipate the moisture fast enough before conditions become sufficient to promote the growth of mold.

[0005] A need has arisen to improve dissipation of water in the exterior walls of buildings.

SUMMARY OF THE INVENTION

[0006] The present invention is intended to augment exterior wall systems to assist in the removal of water or water vapor from such exterior walls. Exterior walls often include insulation products, for example, contoured foam backing or composite siding. Exterior insulation includes

a rear face that contacts the building. The present invention provides a drainage plane on that rear face to facilitate the removal of water from the exterior wall. The drainage plane can be made up of a grid of grooves that provide a path for water to flow. These grooves encourage water from leaks and water from heavy condensation to run theredown off the exterior wall and away from the building. In the preferred embodiment, and when used with composite siding, the water flows out through weep holes located in the bottom of the siding. It is understood that the grooves may be positioned in any number of ways, including vertically or diagonally.

[0006a] Accordingly, in one aspect of the present invention there is provided a siding panel for mounting on an exterior wall of a building comprising:

a siding component; and

a foam panel backing including a main body portion having a rear face, a front face opposite the rear face, a pocketed end, and an overlap end opposite the pocketed end;

wherein the rear face is mountable on the exterior wall and includes a plurality of drainage grooves over the entire rear face adjacent the exterior wall operable to remove water from a surface of the exterior wall;

wherein the front face is configured to be mountable on the siding component;

wherein the pocketed end is formed proximate to a bottom edge of the rear face, the pocketed end having a rearwardly oriented face and an opposed outwardly oriented face, an upper region contiguous with the main body portion and an opposed lower edge, both the bottom edge of the rear face and the rearwardly oriented face of the pocketed end including a plurality of exit grooves positioned along the pocketed end, the exit grooves each having an origin and a terminus, the origin of each exit groove contiguous to and in fluid communication with at least one drainage groove defined in the rear face of the main body portion, the terminus of each exit groove located proximate to the opposed lower edge of the pocketed end to facilitate the removal of water away from a surface of the exterior wall; and

wherein the overlap end is formed to project vertically beyond and horizontally beyond a top edge of the siding component, and wherein the siding component includes a lower lip opposite the top edge, the lower lip positioned a spaced distance away from the opposed lower edge of the pocketed end, the lower lip having a plurality of apertures defined therein and positioned to correspond to at least one terminus of an associated exit groove such that, when the siding panel is in a use position, liquid conveyed from the terminus of an exit groove traverses a spaced distance and is collected and conveyed through at least one aperture.

[0006b] According to another aspect of the present invention there is provided in a foam insulation backing for use with siding products, the insulation backing having a main body portion with a rear face, the improvement comprising:

a plurality of drainage grooves located across the entire rear face, the drainage grooves configured to convey water from the rear face;

a pocketed end of the insulation backing formed proximate to a bottom edge of the rear face, the pocketed end having a rearwardly oriented face and a pocketed end bottom edge distal to the bottom edge of the rear face of the foam panel, the pocketed end having at least one exit groove defined in the rearwardly oriented face of the pocketed end, the at least one exit groove having an origin and an terminus, the origin in fluid communication with at least one drainage groove located across the rear face and the terminus located proximate to the pocketed end bottom edge, the exit groove configured for facilitating the removal of water from a surface of an exterior wall to an associated composite siding panel having corresponding apertures positioned a distance from the terminus of each exit groove;

an overlap end opposite the pocket end having a protrusion extending horizontally outward beyond and vertically beyond a top edge of the composite siding panel; and

a front face opposite the rear face contoured to form fit the composite siding panel.

[0006c] According to yet another aspect of the present invention there is provided a method for making a siding panel for mounting on an exterior wall of a building comprising the steps of:

forming a panel backing having a flat rear face mountable on the exterior wall, the rear face including a plurality of grooves operable to remove water from a surface of the exterior wall; and

mounting a siding component on the panel backing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and wherein:

[0008] Figure 1 is a front perspective view of a composite siding panel including the drainage plane of the present invention;

[0009] Figure 2 is a rear exploded perspective view of a panel backing and siding product including the drainage plane of the present invention;

[0010] Figure 3A is a rear plan view of the backing of Figure 2;

[0011] Figure 3B is a rear plan view of the backing showing the drainage plane arranged in a diagonal pattern;

[0012] Figure 3C is a rear plan view of the backing showing the drainage plane arranged in a vertical pattern;

[0013] Figure 3D is a rear plan view of the backing showing the drainage plane arranged in a square pattern; and

[0014] Figure 4 is a cross sectional view illustrating a preferred groove profile.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] The present invention relates to a drainage arrangement positioned on a rear face of an exterior insulation product. The construction market utilizes a large number of exterior insulation products. The preferred embodiment of the instant application is described in the context of composite siding by example only. It is understood that the instant invention could be applied to any exterior insulation product having a planar surface.

[0016] The drainage arrangement, as it is positioned on the otherwise flat rear face of a

foam backer, is generally referred to as a drainage plane. The drainage plane is configured to encourage water from leaks and water from heavy condensation to run down grooves positioned therein. The grooves can be of any of a wide variety of configurations and can be laid out in any of a wide variety of patterns. The grooves can be positioned in a grid and can be positioned anywhere from vertically to some angle off the vertical. The drainage plane of the present invention is particularly beneficial in those cases where a foam board is positioned flat against another component such as an OSB panel that would naturally resist the water from freely running down the back of the OSB panel.

[0017] With reference to the drawings wherein like items are numbered alike, and with particular reference to Figs. 1, 2, and 3A, a composite siding product 10 is illustrated. The composite siding product 10 can include a panel backing 14 that can be operably attachable or mountable to a siding component 12. By way of example and not limitation, the siding component 12 can be a contoured siding product 12 and/or the panel backing 14 can be a contoured foam backer. It is understood that the backing 14 can be attached to the siding component 12 in a wide variety of fashions, where attaching and mounting are general terms that can include, by way of example and not limitation, an adhesive, chemical bonding, interlocking complementary surfaces, fasteners, and/or "dropping in" the backing 14 at the job site. As seen in Fig. 4, the rear face of the backing 14 can be positioned parallel to and proximate to an exterior wall 18 of a building. Returning to Figs. 1, 2, and 3A, the siding component 12 can include a nail strip 15 that can include at least one nail aperture 15', a locking flange 17, and/or a locking lip 17'. The locking flange 17 can be located at a top edge of the siding 12 and the locking lip 17' can be located at a bottom edge of the siding component 12. The locking flange 17 can be configured to operably engage the locking lip 17' of an adjacent contour siding 12. In this way, the composite siding panels 10 can be vertically interlocked in courses up the exterior wall 18 of the building. Installers can drive nails through nail apertures 15' to secure each piece onto the exterior wall 18.

[0018] By way of example and not limitation, the backing 14 can be formed of an expanded polystyrene (EPS) foam material, and the siding component 12 can be formed of a vinyl material. By way of example and not limitation, the foam can have a permeability rating of 1.0 or higher. By way of example and not limitation, a suitable adhesively-formed composite siding

panel on which the present invention may be advantageously used is manufactured by Progressive Foam Technologies of Beach City, Ohio.

[0019] With reference to Figure 2, the composite siding product 10 is further illustrated. As illustrated in Figure 2, the rear face of the backing 14 can include a drainage plane made up of a grid network that can include a plurality of drainage grooves 19. As shown in the example of Figure 2, the drainage grooves 19 can be positioned in a diamond pattern and can be set apart with a spacing of one inch. As water flows through the grid made up of the drainage grooves 19, the water can flow into a plurality of exit grooves 20. The exit grooves 20 can be positioned on a pocketed area 21 of the backing 14. The exit grooves 20 can intersect the drainage grooves 19. The exit grooves 20 can facilitate the water to travel into at least one weep hole 13. After exiting the at least one weep hole 13, the water can be harmlessly directed to the exterior surface of the siding component 12 and ultimately to the ground.

[0020] As illustrated in Figure 3A, each set of drainage grooves 19 can be arranged in a diamond pattern at roughly a 30° angle from a vertical orientation. It is understood, that, as will be described below, the grooves can be positioned in a wide variety of angles and in a wide variety of patterns.

[0021] With reference to Figures 3B-3D, there is illustrated a plurality of examples of grid arrangements. These arrangements can include a diagonal pattern as illustrated in Figure 3B, a vertical pattern as illustrated in Figure 3C, and/or and a square pattern with the drainage grooves 19 positioned at an angle of 45° from the vertical orientation as illustrated in Figure 3D.

[0022] With reference to Figure 4, the preferred profile of each drainage groove 19 and each exit groove 20 is illustrated. By way of example and not limitation, each drainage groove 19 and each exit groove 20 can have a depth of approximately 1/16 to 1/8 of an inch, inclusive. In the preferred embodiment, each drainage groove 19 and exit groove 20 can have a tapered or rounded bottom 23 to cause the water to flow with reduced surface tension. Each drainage groove 19 and each exit groove 20 can include a tapered edge 21 to encourage water to flow freely into each groove. As water is drawn into the grid, a syphoning effect will cause water flow to increase.

[0023] The drainage plane of the present invention may be formed in a wide variety of

ways. By way of example and not limitation, the drainage plane can be formed by molding the drainage grooves 19 and the exit grooves 20 into the rear face of the backing 14, and/or the drainage grooves 19, and the exit grooves 20 can be cut into the rear face of the backing 14 using hot wires or the like.

What is claimed is:

1. A siding panel for mounting on an exterior wall of a building comprising:

a siding component; and

a foam panel backing including a main body portion having a rear face, a front face opposite the rear face, a pocketed end, and an overlap end opposite the pocketed end;

wherein the rear face is mountable on the exterior wall and includes a plurality of drainage grooves over the entire rear face adjacent the exterior wall operable to remove water from a surface of the exterior wall;

wherein the front face is configured to be mountable on the siding component;

wherein the pocketed end is formed proximate to a bottom edge of the rear face, the pocketed end having a rearwardly oriented face and an opposed outwardly oriented face, an upper region contiguous with the main body portion and an opposed lower edge, both the bottom edge of the rear face and the rearwardly oriented face of the pocketed end including a plurality of exit grooves positioned along the pocketed end, the exit grooves each having an origin and a terminus, the origin of each exit groove contiguous to and in fluid communication with at least one drainage groove defined in the rear face of the main body portion, the terminus of each exit groove located proximate to the opposed lower edge of the pocketed end to facilitate the removal of water away from a surface of the exterior wall; and

wherein the overlap end is formed to project vertically beyond and horizontally beyond a top edge of the siding component, and wherein the siding component includes a lower lip opposite the top edge, the lower lip positioned a spaced distance away from the opposed lower edge of the pocketed end, the lower lip having a plurality of apertures defined therein and positioned to correspond to at least one terminus of an associated exit groove such that, when the siding panel is in a use position, liquid conveyed from the terminus of an exit groove traverses a spaced distance and is collected and conveyed through at least one aperture.

2. The siding panel of claim 1, wherein the plurality of grooves are integrally formed into the rear face of the foam panel backing.

3. The siding panel of claim 1, wherein the plurality of grooves are cut into the rear face of the foam panel backing.

4. The siding panel of claim 3, wherein the plurality of grooves are cut into the rear face of the foam panel backing using hot wires.

5. The siding panel of claim 1, wherein the front face is contoured complementary to a rear face of the siding component.

6. The siding panel of claim 1, wherein the plurality of drainage grooves further comprise a network of grooves positioned in a diamond shaped grid pattern.

7. The siding panel of claim 1, wherein the plurality of drainage grooves further comprise a network of parallel grooves oriented in a diagonal pattern.

8. The siding panel of claim 1, wherein the plurality of drainage grooves further comprise a network of parallel grooves oriented in a vertical pattern.

9. The siding panel of claim 1, wherein the plurality of drainage grooves comprises a network of grooves positioned in a square grid pattern oriented at an angle of forty-five degrees (45°) from vertical.

10. The siding panel of claim 1, wherein the plurality of grooves each has a tapered bottom for increased water flow due to reduced surface tension.

11. The siding panel of claim 1, wherein the plurality of grooves each has a rounded bottom for increased water flow due to reduced surface tension.

12. The siding panel of claim 1, wherein the plurality of grooves each has a tapered edge to encourage water to flow freely into the groove.

13. The siding panel of claim 1, wherein the plurality of apertures comprise a plurality of weep holes.

14. The siding panel of claim 1, wherein the siding component further comprises a nail strip including a plurality of nail apertures for securing the siding to the exterior wall of the building.

15. The siding panel of claim 1, wherein the siding component further comprises:

a locking lip located proximate to the top edge of the siding component;

a locking flange located proximate to a bottom edge of the siding component and configured to operably engage the locking lip of an adjacent siding panel while maintaining water removal through the exit grooves to an external area through the apertures.

16. In a foam insulation backing for use with siding products, the insulation backing having a main body portion with a rear face, the improvement comprising:

a plurality of drainage grooves located across the entire rear face, the drainage grooves configured to convey water from the rear face;

a pocketed end of the insulation backing formed proximate to a bottom edge of the rear face, the pocketed end having a rearwardly oriented face and a pocketed end bottom edge distal to the bottom edge of the rear face of the foam panel, the pocketed end having at least one exit groove defined in the rearwardly oriented face of the pocketed end, the at least one exit groove having an origin and an terminus, the origin in fluid communication with at least one drainage groove located across the rear face and the terminus located proximate to the pocketed end bottom edge, the exit groove configured for facilitating the removal of water from a surface of an exterior wall to an associated composite siding panel having corresponding apertures positioned a distance from the terminus of each exit groove;

an overlap end opposite the pocket end having a protrusion extending horizontally outward beyond and vertically beyond a top edge of the composite siding panel; and

a front face opposite the rear face contoured to form fit the composite siding panel.

17. A method for making a siding panel for mounting on an exterior wall of a building comprising the steps of:

forming a panel backing having a flat rear face mountable on the exterior wall, the rear face including a plurality of grooves operable to remove water from a surface of the exterior wall; and

mounting a siding component on the panel backing.

18. The method of claim 17, wherein the step of forming the plurality of grooves further comprises molding the plurality of grooves into the rear face.

19. The method of claim 17, wherein the step of forming the plurality of grooves further comprises cutting the plurality of grooves into the rear face.

20. The method of claim 19, wherein the step of cutting the plurality of grooves into the rear face further comprises cutting the plurality of grooves into the rear face using a plurality of hot wires.

21. The method of claim 17, wherein the step of mounting the siding component further comprises forming a siding component.

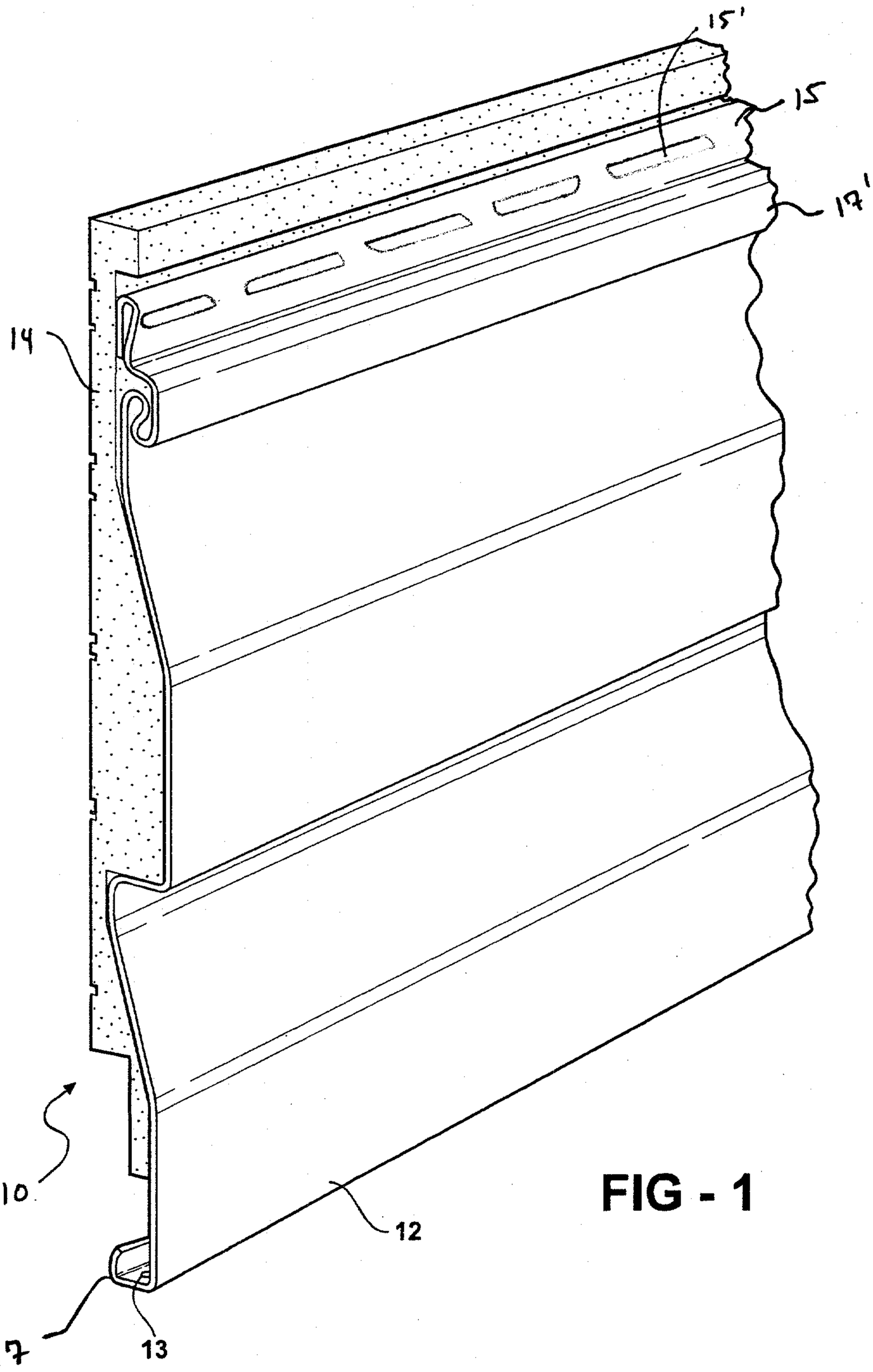


FIG - 1

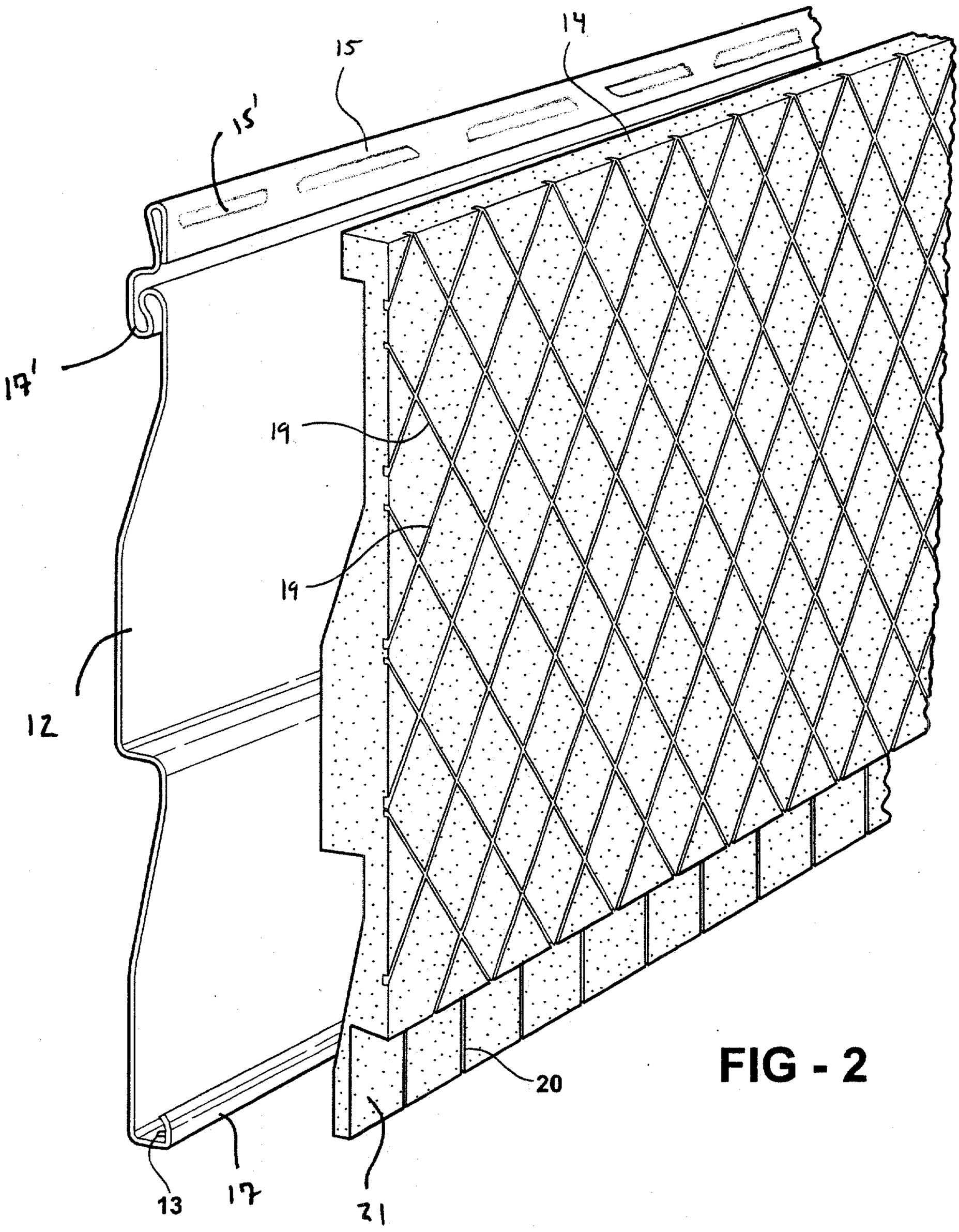


FIG - 2

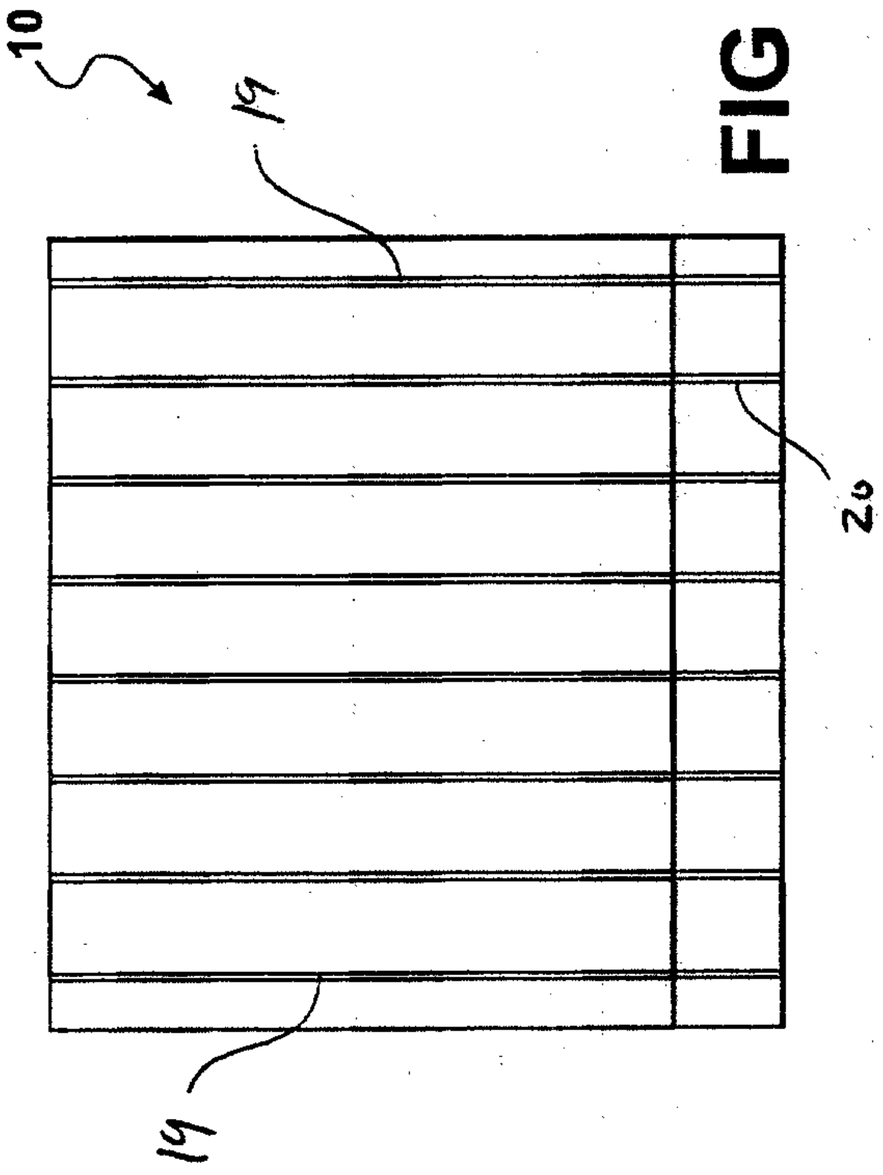


FIG - 3C

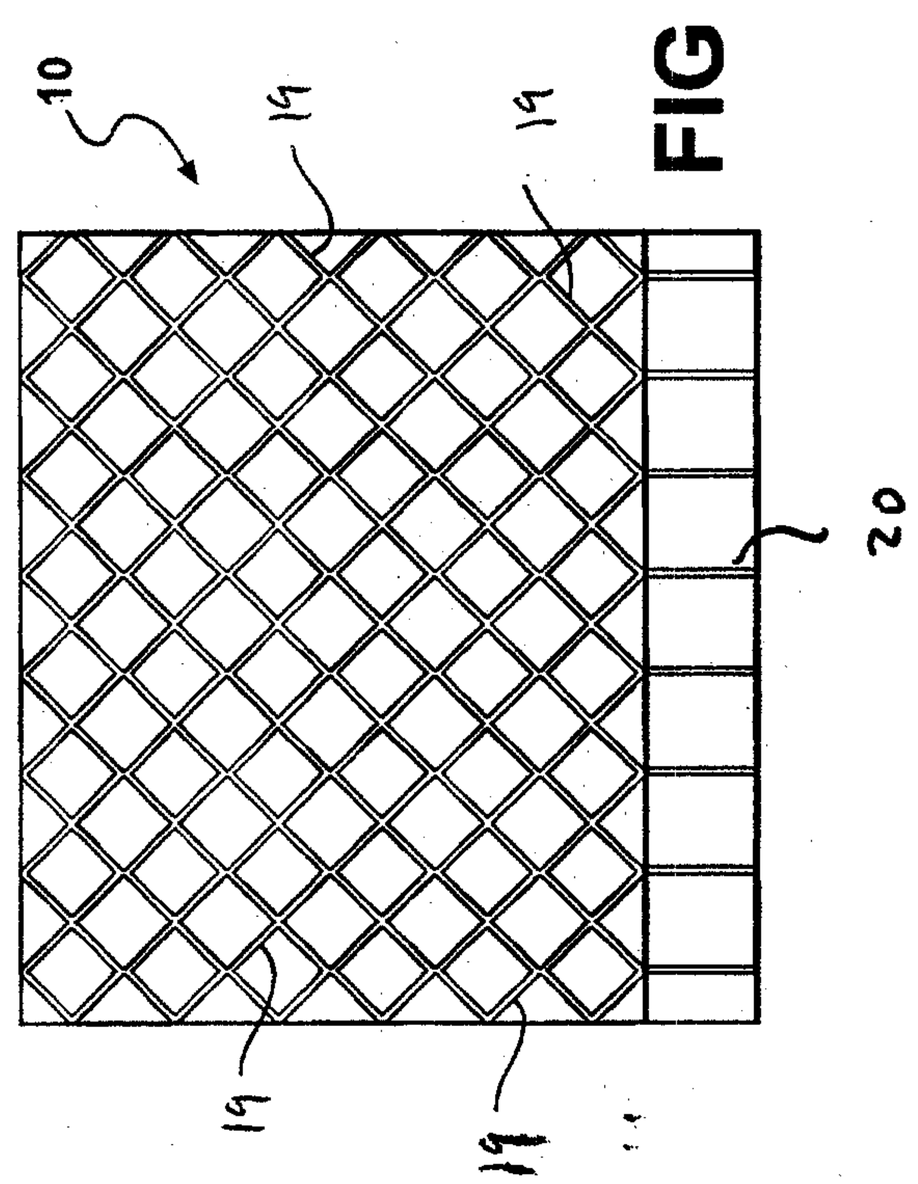


FIG - 3D

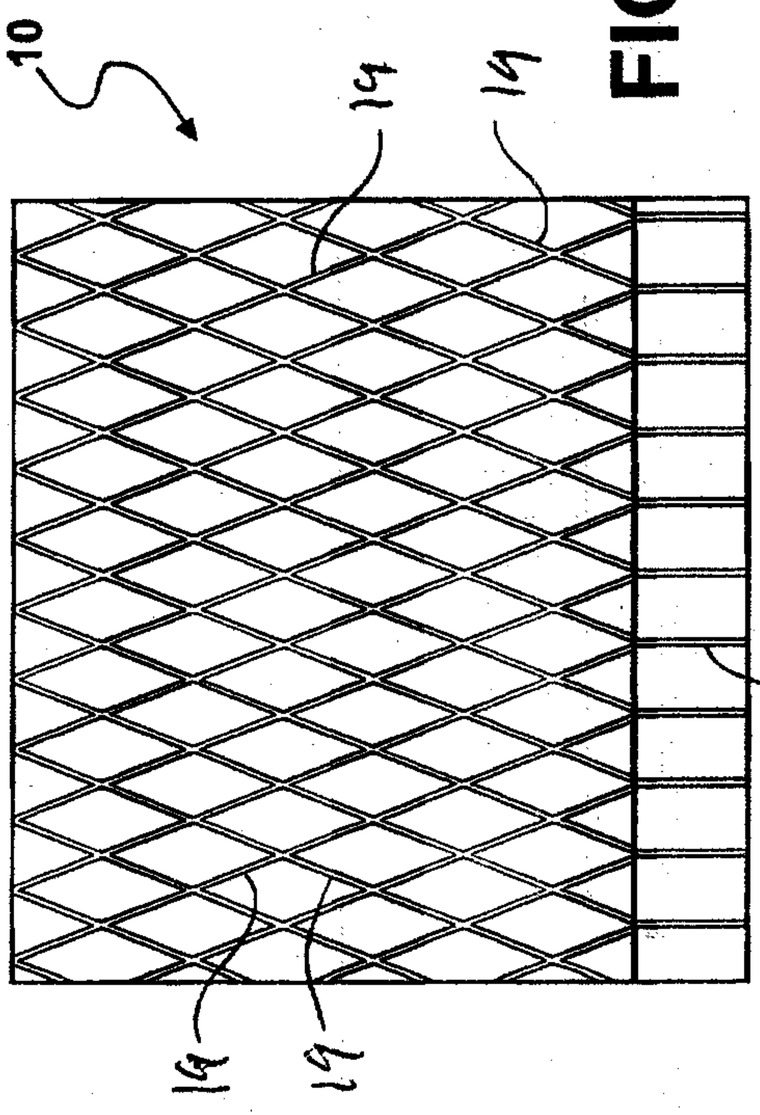


FIG - 3A

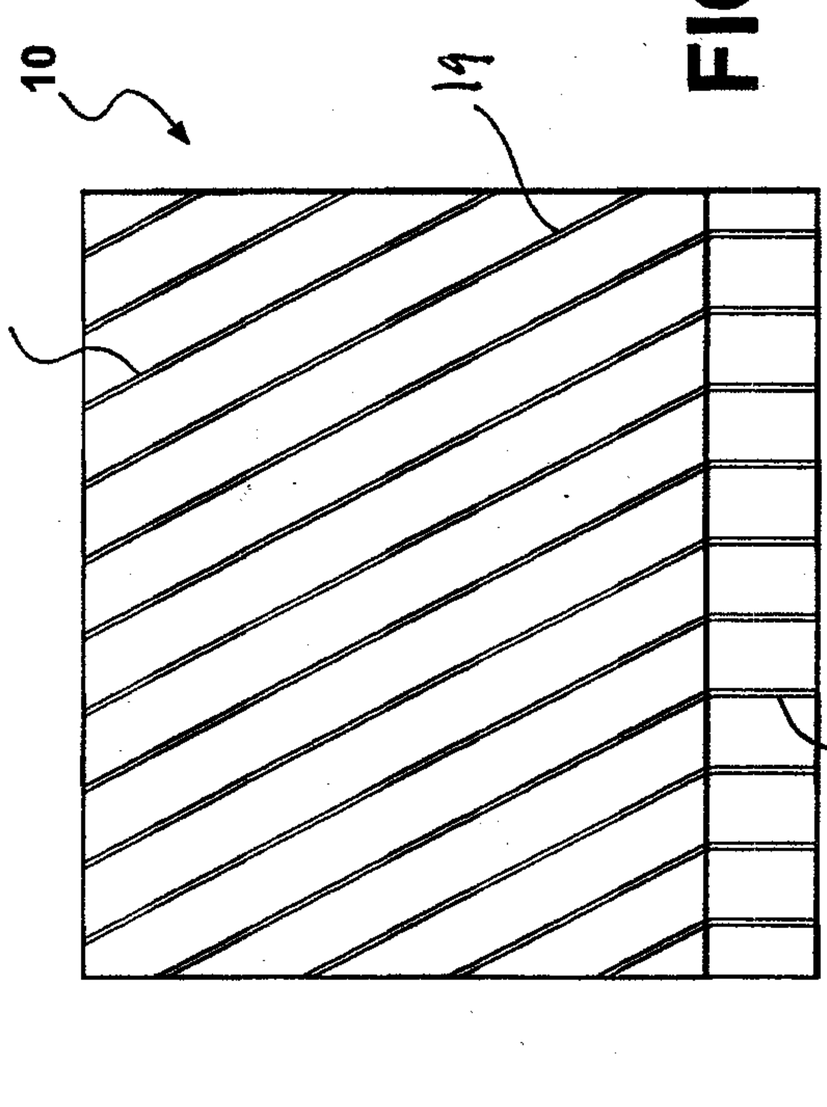


FIG - 3B

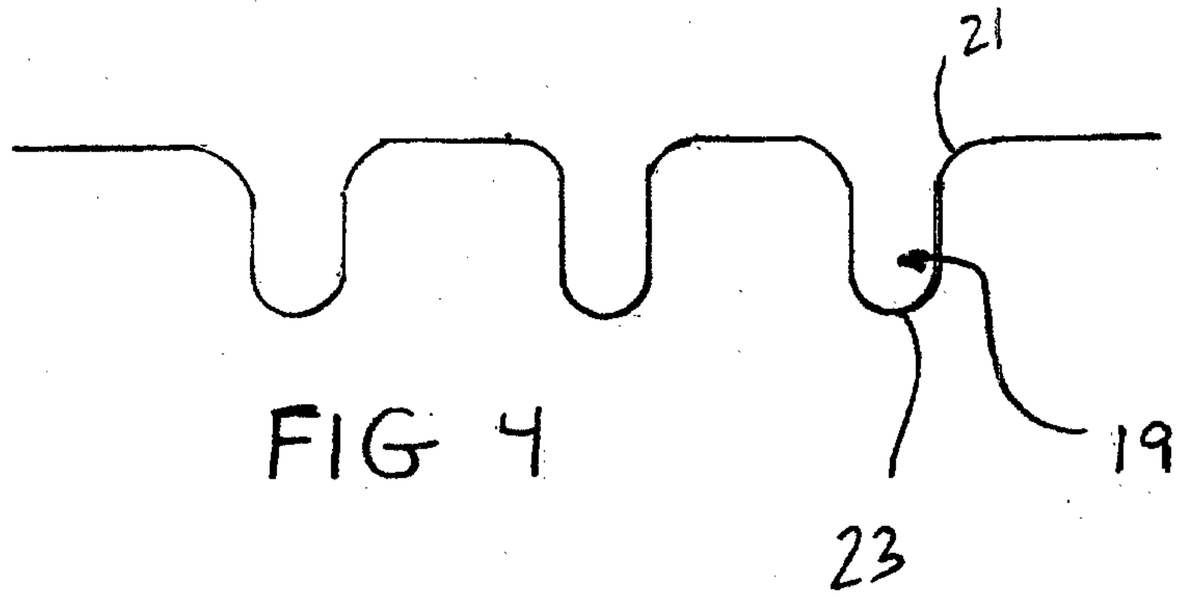
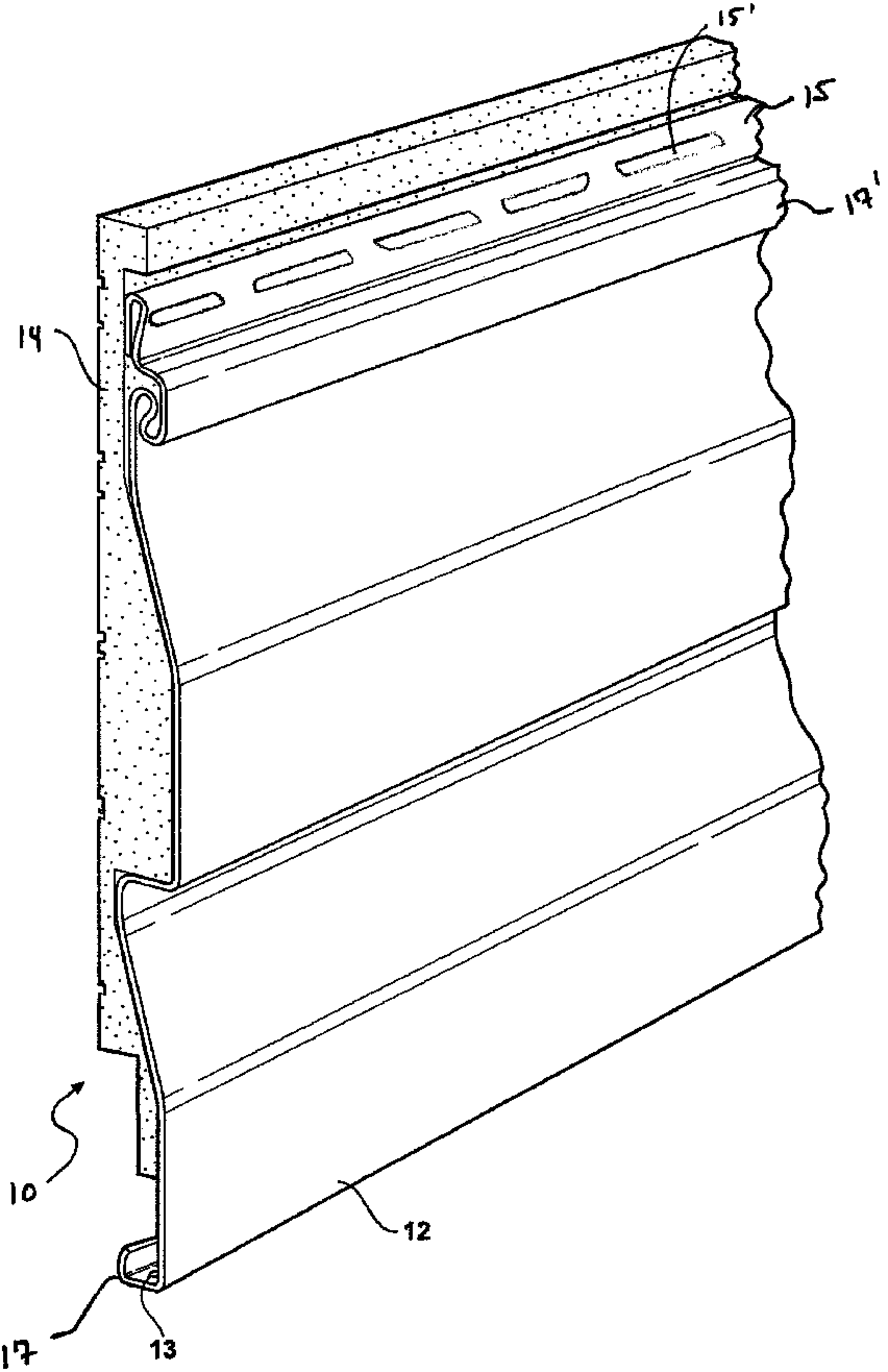


FIG 4


15'
15
19'
14
10
12
17
13