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(54) Self-adhesive extensible and foldable corner flashing for buildings

Selbsthaftende, dehn- und faltbare Eckabdeckung für Gebäude

Relevé d'étanchéité pour angles auto-adhésif, extensible et pliable

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention relates to a flashing member for waterproofing corners of recessed windows and other rough openings in buildings such as doorway openings, ductwork passages, and other types of openings that can be found in houses and other building structures.

Description of the Prior Art

[0002] In building construction, it is important to provide a water-tight seal around any rough openings in exterior walls, including windows and doors. One specific challenge in many buildings is sealing recessed windows. Recessed windows include an outer wall opening that is flush with the exterior of the building, and an inner, recessed framed opening, that lies in a plane behind that of the exterior. Generally, the inner framed opening has a height and width less than that of the outer framed opening. When the window is finally installed, it lies within the inner framed opening.

[0003] The corners of recessed windows are particularly difficult to flash and seal adequately. US Patent Publication Number 2005/0055890A discloses a corner flashing system for sealing the corners of recessed window frames against moisture penetration. The system comprises double-flap members, a half-cube member, and caulking. The double-flap members and the half-cube member are preferably made of asphalt or petroleum based material. U.S. Patent No. 6,401,402 also discloses a flashing system and method for controlling water and air intrusion around windows such as recessed windows, utilizing flashing material creased and folded to form a corner flashing component. However, both of these flashing systems includes seams and gaps through which water can infiltrate, and both systems rely on piercing fasteners to install the flashing, such as staples, providing further opportunity for water to infiltrate.

[0004] Further relevant prior art is disclosed in WO2007/098016 A1 and US 2006 /008 3898A1.

[0005] Therefore, there is a need for a corner flashing system that is well adapted to installation in recessed window frames.

SUMMARY OF THE INVENTION

[0006] In one aspect this invention is directed to a method for flashing recessed corners in a building comprising:

providing a strip of flashing material comprising an elastic, conformable, flexible water resistant topsheet having an extension of at least about 150% at an applied stress no greater than 10 N/cm, a pressure-sensitive adhesive layer covering one surface of said topsheet having an equivalent extension as the top sheet at an equivalent applied stress; and a release sheet removably attached to said adhesive layer having a cross direction perforation dividing the release sheet into two major portions and a machine direction perforation dividing the release sheet into an edge portion and a bulk portion; removing a triangular portion of said release sheet wherein the triangular portion is in the shape of an isosceles triangle bisected by the cross direction perforation of said release sheet, wherein the triangle has a 90° angle at the intersection of the machine direction perforation and the cross direction perforation and to 45° angles along the edge of said edge portion of said release sheet, thereby exposing a triangular portion of said adhesive layer; folding said flashing material along said cross direction perforation, thereby attaching the exposed adhesive layers on opposite sides of the fold line such that the exposed adhesive layers make continuous contact; folding said flashing material along said cross direction perforation to form a right angle between the top sheet surfaces and folding said flashing material along said machine direction perforation to form a right angle between the top sheet surfaces, thereby forming the corner-shaped flashing member; removing the remaining release sheet from said corner-shaped flashing member to expose the remaining adhesive layer; and

attaching said exposed remaining adhesive layer to the recessed corner surfaces, thereby affixing the corner-shaped flashing member in an installation position.

[0007] In another aspect, the invention is also directed to a flashing member according to claim 4, corner in a building opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 is a perspective illustration of the corner flashing member of the invention.

Figure 2 illustrates the cross section of flashing material for forming the corner flashing member of the invention.

Figure 3 is an illustration of the self-adhesive flashing material used to form the corner flashing member of the invention, illustrating the pattern of the release sheet covering the adhesive layer of the flashing material.

Figure 4 is a perspective illustration of a recessed window with the corner flashing member of the invention installed.

DETAILED DESCRIPTION OF THE INVENTION

[0009]

Fig. 1 illustrates a corner flashing member 10 according to the invention. Flashing material 12 has four faces in three planes, 10a, 10a' (it is noted that 10a and 10a' are coplanar), 10b and 10c, where the three planes are at right angles to each other in the shape of a recessed corner. The three planes share three common edges 11 a, 11 b and 11c. The corner flashing member 10 is free of seams or holes through which water could infiltrate behind the flashing. The flashing material 12 is elastic, conformable and flexible such that it can not only fit into the recessed corner of a recessed windows, but it may also be extended ant wrapped around the exterior wall 28 . The length of the flashing material 12 on either side of the corner is at least about 1 inch, and is typically about 6 inches.

Fig. 2 illustrates a cross section of the flashing material 12. Flashing material 12 has a topsheet 14, a pressure sensitive adhesive layer 16 on one surface of the to sheet 14 and a release sheet 18 removably attached to said adhesive layer 16. The top sheet 14 is an elastic, conformable and flexible material. Suitable materials for use as the top sheet 14 include elastic polymer films, elastic woven fabrics, elastic nonwovens, elastic knit fabrics, and laminates thereof. The top sheet 14 has an extension of at least 150% when exposed to an applied stress no greater than 10 N/cm. Preferably, for durability the top sheet 14 has tensile strength of greater than 1000 N/m when measured according to ASTM D1682, section 19.

[0010] The adhesive layer 16 is an elastic, conformable and flexible adhesive. Suitable adhesives include materials conventionally used in the waterproofing art, such as rubber-modified asphaltic or butyl adhesive. The adhesive layer 16 extends an equivalent amount as the top sheet 14 when exposed to an equivalent level of stress. The average thickness of the adhesive layer 16 can be 5-100 mils (i.e. 0,127-2,54 mm). The minimum thickness of the adhesive layer 16 depends on what is needed to provide good adhesion and, optionally, if desired, nail sealability given the adhesive composition used. For instance, a 10-60 mils (i.e. 0,254-1,524 mm) thick layer of butyl adhesive has been found to be sufficient.

[0011] The release sheet 18 can be any known material suitable for use as a release liner on rubberized asphalt and butyl adhesive.

[0012] An inventive method for forming the corner flashing member 10 will now be described. A discrete section of an elongated strip of flashing material 12 is provided. Fig. 3 illustrates the pattern of perforations in the release sheet 18. For each corner flashing member 10, perforations 18e extending in the cross direction divide the release sheet 18 into two roughly equal major portions along the machine direction and perforations 18f extending in the machine direction divide the release sheet 18 into two unequal portions along the cross direction, a narrower edge portion 18a and a wider bulk portion 18b. A plurality of corner flashing members 10 can be formed from an elongated strip of flashing material 12. A cut line 18d represents where a cut is made in the flashing material 12 in order to divide the elongated strip of the flashing material 12 into individual sections of the flashing material 12 each forming a single corner flashing member 10.

[0013] A triangular portion 18c of the release sheet 18 is removed from the flashing material 12, thereby exposing a triangular portion 18c of the underlying adhesive layer 16. The triangle is defined by the perforations in the release sheet 18 and the edge of the strip of flashing material 12. The tip of the triangle is located at the intersection of the machine direction perforation 18f and the cross direction perforation 18e, where the triangle has a 90° angle, and the base of the triangle is the edge of the strip where the triangle has two 45° angles. The triangular portion 18c is bisected by the cross direction perforation 18e. For embodiments in which the triangular portion 18c of the release sheet 18 is removed at the building site just prior to installation, the triangular portion 18c of the release sheet 18 can be perforated for removal at the building site; alternatively the triangular portion 18c can be scored and removed using a knife or box cutter..

[0014] The strip of flashing material 12 is folded along the cross direction perforation 18e, thereby attaching the exposed adhesive layers 16 on opposite sides of the fold line such that the exposed adhesive layers 16 make continuous contact. The resulting adhesive-to-adhesive layer effectively becomes one continuous adhesive layer with no space between the original adhesive layers 16. This provides no seam or hole for water to infiltrate. When the flashing material 12 is folded, the resulting adhesive-to-adhesive layer forms a strong, durable dog-eared seal 20 as shown in Fig. 1. In both Figs. 1 and 4, the corner flashing member 10 is depicted in a right hand corner, however the flashing material 12 can be folded such that the corner flashing member 10 fits into either a right hand corner or a left hand corner.

[0015] It is common in some recessed windows to install a second framing member within the framing member in which the window is installed. In order to accommodate this type of construction, the edge portion of the release sheet 18 of the flashing material 12 is made wider in order to cover the nailing fin of the window. Multiple perforations can be made in the machine direction on the flashing material 12 in anticipation that the corner flashing numbers could be used on multiple types of window construction.

[0016] Once the seal 20 is formed, the flashing material 12 is folded along the cross direction perforation 18e in the direction opposite the direction it was folded to form the seal 20, to form a right angle between topsheet sur-

faces. The flashing material 12 is also folded along the machine direction perforation 18f to form a right angle between topsheet surfaces, such that the corner-shaped flashing member 10 is formed.

[0017] The method for forming the flashing member 10 can be carried out at the time of installation starting with a strip of flashing material 12. Alternatively, the corner members 10 can be preformed and delivered to the building site for subsequent installation. According to one preferred embodiment, a length of flashing material 12 having the above described pattern of perforations in the release sheet 18 is formed and the triangular portions 18c of the release sheet 18 are removed to expose the underlying butyl adhesive. The length of flashing material 12 is then folded in a "fanfold" manner such that the material is folded in alternating directions at each cross direction perforation 18e, and such that the exposed butyl adhesive is folded on itself to form the seal 20. The thus folded material can be packaged for delivery to installation sites. At the installation site, the installer can complete the formation of the corner member 10 just prior to installation, by cutting along perforation 18d to form individual corner flashing members 10 which are folded onto themselves, and subsequently inverting or turning the corner "inside out" to form the shape of a right angle corner for installation.

[0018] In order to install the corner flashing member 10, the release sheet 18 is removed from the outer surfaces of the flashing member 10 to expose the adhesive layer 16 on the outer surfaces. The exposed adhesive can then be attached directly to the interior surfaces of the recessed window, thereby affixing the flashing member 10 an installation position, as illustrated in Fig. 4. In order to ensure that the corner flashing member 10 is affixed securely in the corner of the window, preferably only one piece of the release sheet 18 is removed at a time, so that the corner flashing member 10 can be first affixed to the framing members 22 forming the window opening. Once the flashing member 10 is adhered to the framing members 22 and/or nailing fin of the windows, the remaining pieces of release sheet 18 are removed, so that the corner flashing member 10 can be affixed to recessed sill 24 and window jamb 26 surfaces. As can be seen from Fig. 3, the flashing material 12 can also be extended and wrapped around the corner of the recessed sill 24 and window jamb surfaces 26 to cover a portion of the exterior wall 28. Typically, fasteners F such as nails or staples are installed through the flashing material 12 to secure it to the exterior wall 28. Also typically, the flashing material 12 on the exterior wall 28 extends at least 2 inches (i.e. 50,8 mm) from the recessed sill 24 and jamb 26 surfaces of the recessed window opening. As depicted in Fig. 1, the seal 20 extends outward in a dog-eared manner, but for convenience purposes can be attached to surface 10a (or 10a') as shown in Fig. 4.

Claims

1. A method for flashing recessed corners in a building comprising:

   providing a strip of flashing material (12) comprising an elastic, conformable, flexible water resistant topsheet (14), a pressure-sensitive adhesive layer (16) covering one surface of said topsheet (14), and a release sheet (18) removably attached to said adhesive layer (16) having a cross direction perforation (18e) dividing the release sheet (18) into two major portions and a machine direction perforation (18f) dividing the release sheet (18) into an edge portion (18a) and a bulk portion (18b);

   characterized by

   removing a triangular portion (18c) of said release sheet (18) wherein the triangular portion (18c) is in the shape of an isosceles triangle bisected by the cross direction perforation (18e) of said release sheet (18), wherein the triangle has a 90° angle at the intersection of the machine direction perforation (18f) and the cross direction perforation (18e) and two 45° angles along the edge of said edge portion (18a) of said release sheet (18), thereby exposing a triangular portion (18c) of said adhesive layer (16);

   folding said flashing material (12) along said cross direction perforation (18e), thereby attaching the exposed adhesive layers (16) on opposite sides of the fold line such that the exposed adhesive layers (16) make continuous contact;

   folding said flashing material (12) along said cross direction perforation (18e) to form a right angle between the top sheet surfaces (14) and folding said flashing material (12) along said machine direction perforation (18f) to form a right angle between the top sheet surfaces (14), thereby forming the corner-shaped flashing member (10);

   removing the remaining release sheet (18) from said corner-shaped flashing member (10) to expose the remaining adhesive layer (16); and

   attaching said exposed remaining adhesive layer (16) to the recessed corner surfaces, thereby affixing the corner-shaped flashing member (10) in an installation position,

   wherein the topsheet (14) and the pressure-sensitive adhesive layer (16) having an extension of at least about 150% at an applied stress no greater than 10 N/cm.

2. The method of claim 1 wherein said adhesive (16) is a rubberized asphalt or butyl adhesive.

3. The method of claim 1 wherein said topsheet (14) is a continuous film, a woven fabric, a nonwoven, or a

laminate thereof.

4. A flashing member (10) for flashing recessed corners in a building, comprising an elastic, conformable, flexible water resistant topsheet (14), a pressure-sensitive adhesive layer (16) covering one surface of said topsheet (14), and a release sheet (18) removably attached to said adhesive layer (16)
wherein fasteners (F) are not required to hold the flashing member (10) within the recessed corner **characterized by**
the topsheet (14) and the pressure-sensitive adhesive layer (16) having an extension of at least about 150% at an applied stress no greater than 10 N/cm, and
the pressure-sensitive adhesive layer (16) having a cross direction perforation (18e) dividing the release sheet (18) into two major portions and a machine direction perforation (18f) dividing the release sheet (18) into an edge portion (18a) and a bulk portion (18b), and a triangular portion (18c) in the shape of an isosceles triangle bisected by the cross direction perforation (18e) of said release sheet (18), wherein the triangle has a 90° angle at the intersection of the machine direction perforation (18f) and the cross direction perforation (18e) and two 45° angles along the edge of said edge portion (18a) of said release sheet (18), thereby exposing a triangular portion (18c) of said adhesive layer (16).

Patentansprüche

1. Verfahren zum Abdecken zurückgesetzter Ecken in einem Gebäude, wobei das Verfahren aufweist:

Bereitstellen eines Streifens aus Abdeckmaterial (12) mit einer elastischen, schmiegsamen, flexiblen, wasserfesten Deckschicht (14), einer Kontaktklebstoffschicht (16), die eine Oberfläche der Deckschicht (14) bedeckt, und einer Trennfolie (18), die lösbar an der Klebstoffschicht (16) befestigt ist, und eine Perforation (18e) in Querrichtung, welche die Trennfolie (18) in zwei Hauptabschnitte unterteilt, und eine Perforation (18f) in Maschinenrichtung aufweist, welche die Trennfolie (18) in einen Randabschnitt (18a) und einen Hauptabschnitt (18b) unterteilt,
gekennzeichnet durch
Entfernen eines dreieckigen Abschnitts (18c) der Trennfolie (18), wobei der dreieckige Abschnitt (18c) die Form eines gleichschenkligen Dreiecks hat, das **durch** die Perforation (18e) in Querrichtung der Trennfolie (18) halbiert wird, wobei das Dreieck am Schnittpunkt der Perforation (18f) in Maschinenrichtung und der Perforation (18e) in Querrichtung einen Winkel von 90° und entlang der Kante des Randabschnitts (18a) der Trennfolie (18) zwei Winkel von 45° aufweist, wodurch ein dreieckiger Abschnitt (18c) der Klebstoffschicht (16) freigelegt wird;
Falten des Abdeckmaterials (12) entlang der Perforation (18e) in Querrichtung, wodurch die freigelegten Klebstoffschichten (16) an gegenüberliegenden Seiten der Faltlinie so fixiert werden, daß die freigelegten Klebstoffschichten (16) in dauernden Kontakt miteinander kommen;
Falten des Abdeckmaterials (12) entlang der Perforation (18e) in Querrichtung, um einen rechten Winkel zwischen den Deckschichtoberflächen (14) zu bilden, und Falten des Abdeckmaterials (12) entlang der Perforation (18f) in Maschinenrichtung, um einen rechten Winkel zwischen den Deckschichtoberflächen (14) zu bilden und **dadurch** das eckförmige Abdeckelement (10) zu formen;
Entfernen der übrigen Trennfolie (18) von dem eckförmigen Abdeckelement (10), um die übrige Klebstoffschicht (16) freizulegen; und
Befestigen der freigelegten übrigen Klebstoffschicht (16) an den Oberflächen der zurückgesetzten Ecke, wodurch das eckförmige Abdekkelement (10) in einer Installationsposition fixiert wird,
wobei die Deckschicht (14) und die Kontaktklebstoffschicht (16) bei einer angreifenden Spannung von nicht mehr als 10 N/cm eine Dehnung von mindestens etwa 150% aufweisen.

2. Verfahren nach Anspruch 1, wobei der Klebstoff (16) ein gummierter Asphalt-oder Butylklebstoff ist.

3. Verfahren nach Anspruch 1, wobei die Deckschicht (14) ein kontinuierlicher Film, ein Gewebe, ein Faservlies oder ein Laminat daraus ist.

4. Abdeckelement (10) zum Abdecken zurückgesetzter Ecken in einem Gebäude, mit einer elastischen, schmiegsamen, flexiblen, wasserfesten Deckschicht (14), wobei eine Kontaktklebstoffschicht (16) die eine Oberfläche der Deckschicht (14) bedeckt, und eine Trennfolie (18) lösbar an der Klebstoffschicht (16) befestigt ist,
wobei zum Festhalten des Abdeckelements (10) innerhalb der zurückgesetzten Ecke keine Befestigungselemente (F) erforderlich sind,
dadurch gekennzeichnet, daß
die Deckschicht (14) und die Kontaktklebstoffschicht (16) bei einer angreifenden Spannung von nicht mehr als 10 N/cm eine Dehnung von mindestens etwa 150% aufweisen, und
die Kontaktklebstoffschicht (16) aufweist: eine Perforation (18e) in Querrichtung, welche die Trennfolie (18) in zwei Hauptabschnitte unterteilt, und eine Per-

foration (18f) in Maschinenrichtung, welche die Trennfolie (18) in einen Wandabschnitt (18a) und einen Hauptabschnitt (18b) unterteilt, und einen dreieckigen Abschnitt (18c) in Form eines gleichschenkligen Dreiecks, das durch die Perforation (18e) in Querrichtung der Trennfolie (18) halbiert wird, wobei das Dreieck am Schnittpunkt der Perforation (18f) in Maschinenrichtung und der Perforation (18e) in Querrichtung einen Winkel von 90° und entlang der Kante des Randabschnitts (18a) der Trennfolie (18) zwei Winkel von 45° aufweist, wodurch ein dreieckiger Abschnitt (18c) der Klebstoffschicht (16) freigelegt wird.

Revendications

1. Procédé d'établissement de l'étanchéité de coins en retrait dans un immeuble, comprenant l'étape ci-dessous:

fourniture d'une bande de matériau d'étanchéité (12), comprenant une feuille supérieure élastique, adaptable, flexible et résistante à l'eau (14), une couche adhésive autocollante (16) recouvrant une surface de ladite feuille supérieure (14), et une feuille de dégagement (18), fixée de manière amovible sur ladite couche adhésive (16), comportant une perforation dans le sens travers (18e), divisant la feuille de dégagement (18) en deux parties majeures, et une perforation dans le sens machine (18f), divisant la feuille de dégagement (18) en une partie de bordure (18a) et une partie de base (18b) ;
caractérisé par les étapes ci-dessous :

retrait d'une partie triangulaire (18c) de ladite feuille de dégagement (18), la partie triangulaire (18c) ayant la forme d'un triangle isocèle coupé par la perforation dans le sens travers (18e) de ladite feuille de dégagement (18), le triangle formant un angle de 90° au niveau de l'intersection de la perforation dans le sens machine (18f) et de la perforation dans le sens travers (18e), et deux angles de 45° le long du bord de ladite partie de bordure (18a) de ladite feuille de dégagement (18), exposant ainsi une partie triangulaire (18c) de ladite couche adhésive (16) ;
pliage dudit matériau d'étanchéité (12) le long de ladite perforation dans le sens travers (18e), pour fixer ainsi les couches adhésives exposées (16) sur les côtés opposés de la ligne de pliage, de sorte que les couches adhésives exposées (16) établissent un contact continu ;
pliage dudit matériau d'étanchéité (12) le long de ladite perforation dans le sens travers (18e), pour former un angle droit entre les surfaces de la feuille supérieure (14), et pliage dudit matériau d'étanchéité (12) le long de ladite perforation dans le sens machine (18f), pour former un angle droit entre les surfaces de la feuille supérieure (14), afin de former ainsi l'élément d'étanchéité en forme de coin (10) ;
retrait de la partie restante de la feuille de dégagement (18) dudit élément d'étanchéité en forme de coin (10) pour exposer la partie restante de la couche adhésive (16); et
fixation de ladite partie restante de la couche adhésive exposée (16) sur les surfaces de coin en retrait, pour fixer ainsi l'élément d'étanchéité en forme de coin (10) dans une position d'installation ;
la feuille supérieure (14) et la couche adhésive autocollante (16) ayant une extension d'au moins environ 150% en présence de l'application d'une contrainte non supérieure à 10 N/cm.

2. Procédé selon la revendication 1, dans lequel ledit adhésif (16) est adhésif à base d'asphalte caoutchouté ou de butyle.

3. Procédé selon la revendication 1, dans lequel ladite feuille supérieure (14) est un film continu, un tissu tissé, un non tissé ou un stratifié de ces éléments.

4. Elément d'étanchéité (10) pour établir l'étanchéité de coins en retrait dans un immeuble, comprenant une feuille supérieure élastique, adaptable, flexible et résistante à l'eau (14), une couche adhésive autocollante (16) recouvrant une surface de ladite feuille supérieure (14), et une feuille de dégagement (18), fixée de manière amovible sur ladite couche adhésive (16) ;
des éléments de fixation (F) n'étant pas nécessaires pour retenir l'élément d'étanchéité (10) dans le coin en retrait ;
caractérisé en ce que
la feuille supérieure (14) et la couche adhésive autocollante (16) ont une extension d'au moins environ 150% en présence de l'application d'une contrainte non supérieure à 10Nfcm, et
la couche adhésive autocollante (16) comporte une perforation dans le sens travers (18e), divisant la feuille de dégagement (18) en deux parties majeures, et une perforation dans le sens machine (18f), divisant la feuille de dégagement (18) en une partie de bordure (18a) et une partie de base (18b) ; et par une partie triangulaire (18c) sous forme d'un triangle isocèle, coupé par la perforation dans le sens travers (18e) de ladite feuille de dégagement (18), le triangle

formant un angle de 90° au niveau de l'intersection entre la perforation dans le sens machine (18f) et la perforation dans le sens travers (18e), et deux angles de 45° le long du bord de ladite partie de bordure (18a) de ladite feuille de dégagement (18), exposant ainsi une partie triangulaire (18c) de ladite couche adhésive (16).

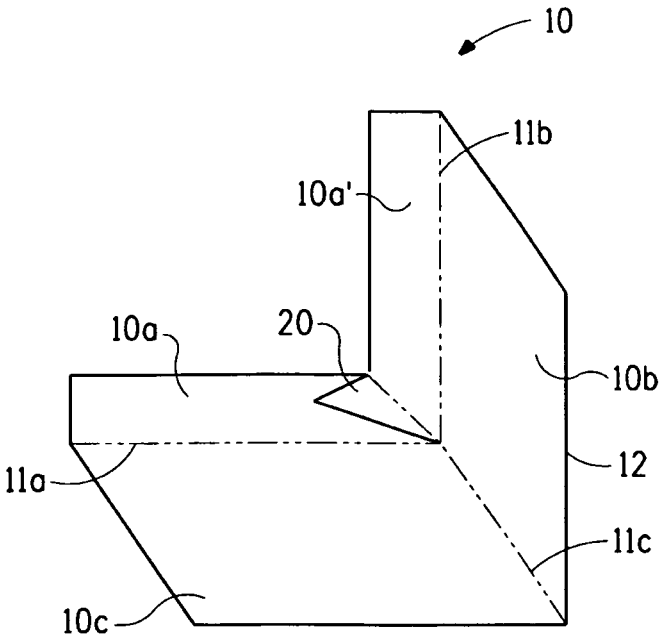


FIG. 1

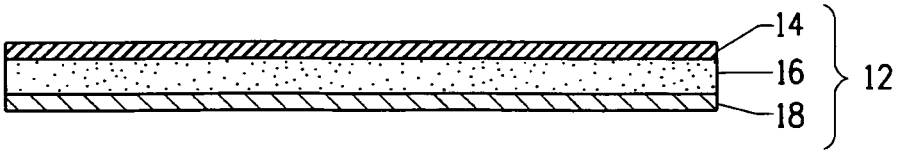


FIG. 2

FIG. 3

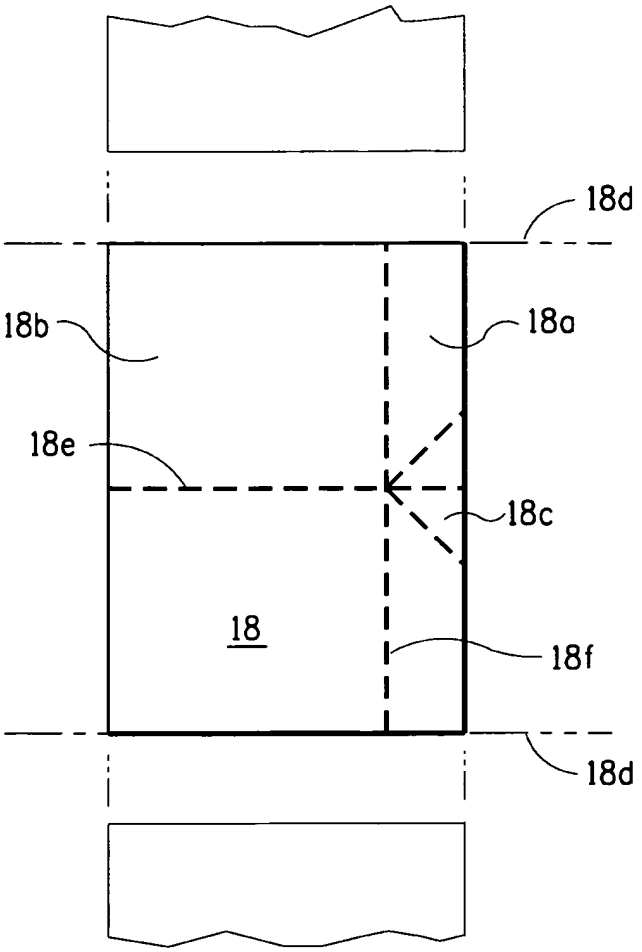
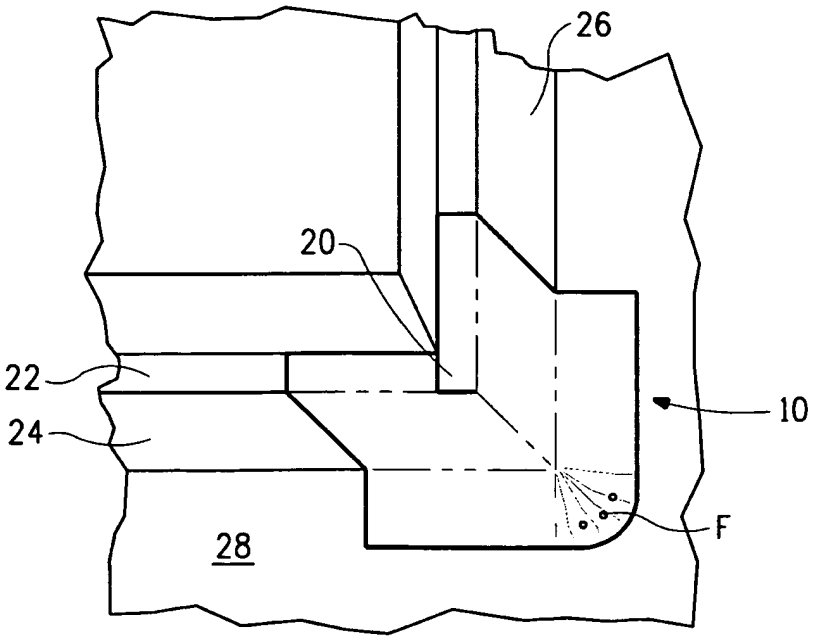


FIG. 4



REFERENCES CITED IN THE DESCRIPTION

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