



(22) Date de dépôt/Filing Date: 2004/03/24

(41) Mise à la disp. pub./Open to Public Insp.: 2005/01/10

(30) Priorité/Priority: 2003/07/10 (10/616,806) US

(51) Cl.Int.⁷/Int.Cl.⁷ E06B 7/16, E06B 3/66, E06B 3/24

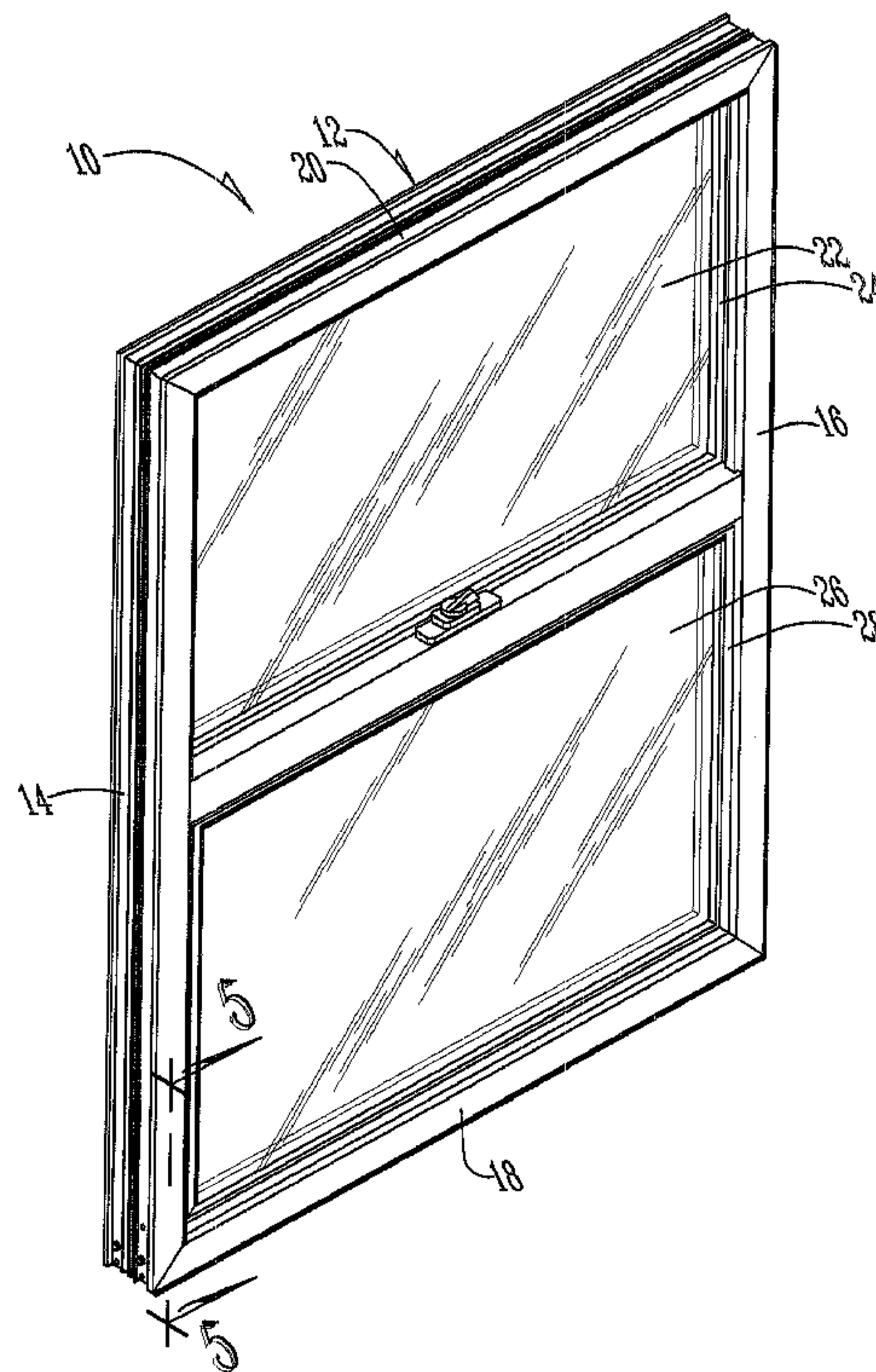
(71) Demandeur/Applicant:
PELLA CORPORATION, US

(72) Inventeurs/Inventors:
PACE, BRANDON N., US;
BERNHAGEN, TODD A., US;
MINTER, MEARL J., US

(74) Agent: SMART & BIGGAR

(54) Titre : METHODE ET DISPOSITIF DE SCELLEMENT DE CADRE DE FENESTRAGE

(54) Title: METHOD AND APPARATUS FOR SEALING A FENESTRATION FRAME



(57) **Abrégé/Abstract:**

A corner bracket assembly for securing members of a window sash frame together. The assembly includes a plurality of frame members coupled together by corner brackets. Once the frame has been assembled, a flowable sealant material is injected into each corner of the frame in a manner which directs the sealant material around the entirety of the corner bracket to provide positive sealing and structural support to the window sash frame.



ABSTRACT OF THE DISCLOSURE

A corner bracket assembly for securing members of a window sash frame together.

- 5 The assembly includes a plurality of frame members coupled together by corner brackets.

Once the frame has been assembled, a flowable sealant material is injected into each corner of the frame in a manner which directs the sealant material around the entirety of the corner bracket to provide positive sealing and structural support to the window sash frame.

METHOD AND APPARATUS FOR SEALING A FENESTRATION FRAME

Background of the Invention

5 Field of the Invention

The present invention relates in general to a method and apparatus for sealing a corner of a fenestration sash frame and, more particularly, to a method and apparatus which provides structural support and fluid containment to a fenestration sash frame.

10 Description of the Prior Art

It is well known in the art to provide a sealing material on corner brackets for insulating a sash in a manner such as that taught in U.S. Letters Patent No. 6,401,428 to Glover, et al, and U.S. Letters Patent No. 4,145,150 to Rafeld. One drawback associated with
15 such prior art constructions is the inability to provide sealing material around the entirety of the corner bracket. Failure to completely surround the corner bracket with sealing material increases the likelihood of moisture and/or other elements intruding into or through the frame members.

Accordingly, it would be desirable to provide a method for providing a sealant
20 material around the entirety of the surface of the corner bracket coming into contact with the frame members. While it is known in the art to lap corner brackets with an insulating tape, such tape may tend to gap, thereby preventing a solid seal and inviting the intrusion problems noted above.

It is also known in the art to provide sealant material on non-mitered fenestration
25 spacer assemblies in a manner such as that taught by U.S. Letters Patent No. 4,651,482 to Borys. Such prior art devices, however, are designed for more fragile spacer assemblies and do not provide for the enclosure and rigidity required of frame members. It would be,

therefore, desirable to provide a corner bracket assembly with a sealant material which added structural support to a fenestration frame.

It is also known in the art to connect frame member corners by heating the corners and pressing them together. Such methods, however, often do not provide adequate support structure for the final frame, produce weld flashes which must be subsequently removed, and often require additional painting, adding to the cost and labor associated with construction. It would be, therefore, desirable to provide a low-cost construction method which provided a solid seal and added structural support to the sash frame assembly, without the additional time and cost associated with weld flash removal or other subsequent steps.

The difficulties encountered in the prior art discussed hereinabove are substantially eliminated by the present invention.

Summary of the Invention

In an advantage provided by this invention, a corner bracket is integrally sealed with a fenestration sash frame assembly, adding structural support to the frame.

Advantageously this invention provides a fenestration sash frame assembly which eliminates the need for subsequent steps of flash weld removal and repainting.

Advantageously, this invention provides a more efficient sash frame member production method.

Advantageously, in a preferred example of this invention, a corner bracket is provided with first and second longitudinally extending legs. Each leg is provided with means for engaging an interior surface of a sash frame member, and means for retaining a flowable material in contact with the interior surface of the sash frame member. Means are provided for securing the legs to one another, and means are also provided for directing a flowable material to both of the retaining means.

Preferably, the corner bracket is provided with a port on an inward surface of the sash frame. The corner bracket is inserted into mitered frame members and a flowable material is injected through the injection port to fully surround the corner bracket and create a seal between the corner bracket and sash frame members.

5

Brief Description of the Drawings

The present invention will now be described, by way of example, with reference to the accompanying drawings in which:

Fig. 1 illustrates a top perspective view of the improved fenestration frame of the present invention;

10

Fig. 2 illustrates a top perspective view of the lower sash of the frame of Fig. 1;

Fig. 3 illustrates a perspective view in partial cross-section of the corner of the lower sash of Fig. 2;

Fig. 4 illustrates a perspective view of the corner bracket of the present invention;

15

Fig. 5 illustrates a perspective side view in cross-section of the present invention, taken along lines 5-5 of Fig. 1; and

Fig. 6 illustrates a perspective view of the corner of the window frame secured by the method of the present invention.

20

Detailed Description of the Preferred Embodiment

A window according to the present invention is shown generally as (10) in Fig. 1.

The window (10) is provided with a frame (12), including a first side jamb (14), a second side jamb (16), a sill (18) and a head jamb (20). Slidably coupled within the frame (12) are an upper sash (22) having a frame (24) and a lower sash (26) having a frame (28). In the preferred embodiment the frames (24) and (28) are constructed of pultrusion, but may be

25

constructed of aluminum, polyvinylchloride, or any other desired type of material known in the art.

As shown in Fig. 2, the frame (28) of the lower sash (26) is provided with a left stile (30), a right stile (32), a top rail (34) and a bottom rail (36). As shown in Fig. 3, the left stile (30) is provided with a mitered corner (38), and the bottom rail (36) is also provided with a mitered corner (40). Shown in Fig. 4 is the corner bracket (42) of the present invention. The corner bracket (42) may be constructed of any suitable material. In the preferred embodiment, the corner bracket (42) is constructed of nylon, but may be constructed of any suitable material known in the art. The corner bracket (42) is provided with a first longitudinally extending leg (44) and a second longitudinally extending leg (46). The legs (44) and (46) are coupled to one another by a corner piece (48), integrally molded as part of the corner bracket (42).

As shown in Fig. 4, the corner bracket (42) is constructed with a top face (50) and a bottom face (52). In the preferred embodiment, the top face (50) is provided with a plurality of fins (54) which may be of any suitable height, width and length, for the purpose of retaining the corner bracket (42) within the rails (34) and (36) and stiles (30) and (32). Fins (54) may also be provided on the bottom face (52) of the corner bracket (42). The corner bracket (42) is also provided with an injection port (56), defining a hole (58). Positioned below the injection port (56) is a curved diffuser (60) which feeds a deep recess (61) which, in turn, feeds to a shallow recess (62). The recesses (61) and (62) are provided on either side of the corner bracket (42) and are bordered by fins (54) which serve to direct and maintain sealant material (78) within the recesses (61) and (62). The recesses (61) and (62) may be of any suitable dimensions, but are preferably in fluid communication with the lateral and internal abutting edge of the rail (36) and stile (30) within which it is positioned.

Accordingly, when the sealing material (78) is injected, as explained fore fully below, the

sealing material (78) creates a fluid-tight seal along the lateral and internal edges of the rail (36) and stile (30). Preferably, the recesses (61) and (62) do not extend along the outer abutting edge of the rail (36) and stile (30). Since the outer abutting edge is typically shielded by the window frame (12), little moisture enters the sash (26). Additionally, since
5 this arrangement allows for the influx and egress of fluid, the sash (26) does not develop pressure as the temperature increases, and any moisture entering the sash (26) simply weeps out of the bottom corners.

As shown in Figs. 3, 4 and 5, when it is desired to construct the frame (28) of the lower sash (26), the first leg (44) is inserted into an interior (64) of the left stile (30), defined
10 by an interior surface (66) thereof. Similarly, the second leg (46) is inserted into an interior (68) defined by the interior surface (70) of the bottom rail (36). As shown in Fig. 5, both the left stile (30) and bottom rail (36) are provided with small cutouts (72) on their respective inward faces (74) and (76) to accommodate the injection port (56). As shown in Fig. 5, in addition to serving as material retainers, the fins (54) serve to resiliently bias the corner
15 bracket (42) against the interior surface (66) of the left stile (30) and interior surface (70) of the bottom rail (36).

Once corner brackets (42) have been so installed in each corner of the frame (12), the frame is clamped in a manner such as that known in the art, and the flowable sealant material (78) which, in the preferred embodiment is a urethane reactive hot melt, or similar flowable
20 adhesive, such as those known in the art, is injected through the hole (58) of the injection port (56). As the sealant material (78) moves through the hole (58), the sealant material (78) contacts the diffuser (60), which directs the sealant material (78) toward the recesses (61) and (62). As the sealant material (78) moves across each of the legs (44) and (46), the fins (54) near the recesses (61) and (62) maintain the sealant material (78) in the recesses (61) and

(62), forcing the sealant material (78) around the entirety of the corner bracket (42) covering both the top face (50) and sides of the corner bracket (42).

As shown in Figs. 4 and 5, this directing of the sealant material (78) causes the sealant material (78) to form a fluid-tight barrier between the interior surfaces (66) and (70) of the left stile (30) and bottom rail (36) of the frame (28) of the lower sash (26) and the corner bracket (42) itself. The fins (54) act to retain the sealant material (78) and frame (28) in place as the sealant material (78) dries. As the sealant material (78) provides structural support to the frame (28), the frame (28) may be unclamped and moved along for additional processing before the sealant material (78) has completely hardened.

As shown in Figs. 4 and 6, the frame (12) of the window (10) itself may be secured by the foregoing method. If desired, screws (80) may be provided through the frame (12) to engage the corner brackets (42) to add additional rigidity and stability to the frame (12).

Although the invention has been described with respect to a preferred embodiment thereof, it is to be also understood that it is not to be so limited, since changes and modifications can be made therein, which are within the full intended scope of this invention as defined by the appended claims. As an example, the sealing method of the present invention may be used in association with sashes, doors or any desired frame assembly.

What is claimed is:

1. A corner bracket comprising:

(a) a first longitudinally extending leg comprising:

(i) first means for engaging an interior surface of a first frame member;

(ii) first means for retaining a flowable material in contact with said interior surface of said first frame member.

(b) a second longitudinally extending leg comprising:

(i) first means for engaging an interior surface of a second frame member;

(ii) first means for retaining a flowable material in contact with said interior surface of said second frame member.

(c) means for securing said first longitudinally extending leg to said second longitudinally extending leg;

(d) first means for directing a flowable material to said first retaining means; and

(e) second means for directing a flowable material to said second retaining means.

2. The corner bracket of Claim 1, further comprising an injection port in fluid communication with said first directing means and said second directing means.

3. The corner bracket of Claim 1 wherein said securing means is means for securing said first longitudinally extending leg to said second longitudinally extending leg in a manner defining a bracket having an inward surface, an outward surface, and at least one side surface.

4. The corner bracket of Claim 3, further comprising an injection port in fluid communication with said first directing means and said second directing means, wherein said injection port is not located on said outward surface of said bucket.

5. The corner bracket of Claim 4, wherein said injection port is located on said inward surface of said bracket.

6. The corner bracket of Claim 1, wherein said first retaining means is means for retaining a flowable material in contact with an interior surface of said first frame member.

7. The corner bracket of Claim 1, wherein said first frame member is mitered and wherein said second frame member is mitered.

8. The corner bracket of Claim 7, wherein said first engaging means and said second engaging means are means for coacting to retain said first frame member and said second frame member in mitered engagement with one another.

9. The corner bracket of Claim 8, further comprising an injection port in fluid communication with said first directing means and said second directing means, wherein said injection port is provided across an inward surface of said mitered engagement.

10. The corner bracket of Claim 1, further comprising a flowable sealing material disposed between said first frame member and said first longitudinally extending frame member in a manner sufficient to create a substantially fluid tight seal therebetween.

11. A corner bracket assembly comprising:

- (a) a first mitered frame member defining a first interior;
- (b) a second mitered frame member defining a second interior,
- (c) wherein said first mitered frame member is in mitered engagement with said second mitered frame member;
- (d) a first longitudinally extending leg defining a first perimeter;

- (e) wherein said first longitudinally extending leg is provided within said first interior;
- (f) wherein said second longitudinally extending leg is provided within said second interior;
- 5 (g) means for coupling said first longitudinally extending leg to said second longitudinally extending leg;
- (h) a flowable sealant provided around said first perimeter between said first mitered frame member and said first longitudinally extending leg; and
- 10 (i) wherein said flowable material is provided around said second perimeter between said second mitered frame member and said second longitudinally extending leg.

12. The corner bracket assembly of Claim 11, further comprising a plurality of fins provided on said first longitudinally extending leg and said second longitudinally
15 extending leg.

13. The corner bracket assembly of Claim 11, further comprising an injection port provided on at least a portion of said first mitered frame member.

14. The corner bracket assembly of Claim 11, wherein said flowable material provides a substantially fluid tight seal between said first mitered frame member and said
20 second longitudinally extending leg.

15. A method for sealing a fenestration assembly comprising:

- (a) providing a corner bracket comprising:
 - (i) a first longitudinally extending leg defining a first perimeter;
 - (ii) a second longitudinally extending leg defining a first
25 perimeter; and

(iii) means for coupling said first longitudinally extending leg to said second longitudinally extending leg.

(b) inserting said first longitudinally extending leg into a first interior defined by a first frame member;

5 (c) inserting said second longitudinally extending leg into a second interior defined by a second frame member;

(d) inserting a flowable sealant around said first perimeter between said first longitudinally extending leg and said first frame member; and

10 (e) inserting said flowable sealant around said second perimeter between said second longitudinally extending leg and said second frame member.

16. The method for sealing a fenestration assembly of Claim 15, wherein said first frame member and said second frame member are mitered and further comprising positioning said first frame member into mitered engagement with said second frame member.

15 17. The method for sealing a fenestration assembly of Claim 15, further comprising clamping said first frame member into engagement with said second frame member during said steps of:

(a) inserting a flowable sealant around said first perimeter between said first longitudinally extending leg and said first frame member; and

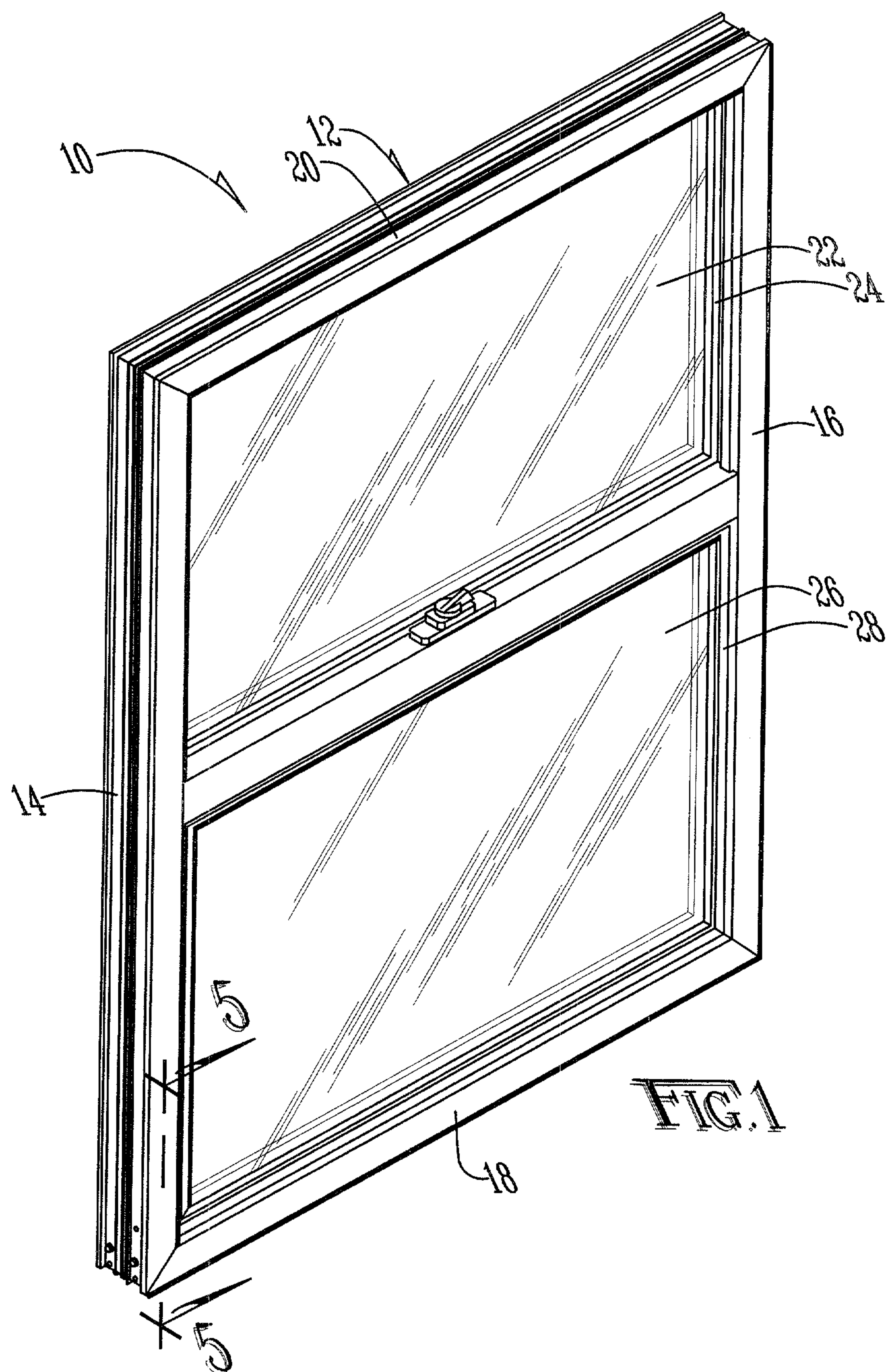
20 (b) inserting said flowable sealant around said second perimeter between said second longitudinally extending leg and said second frame member.

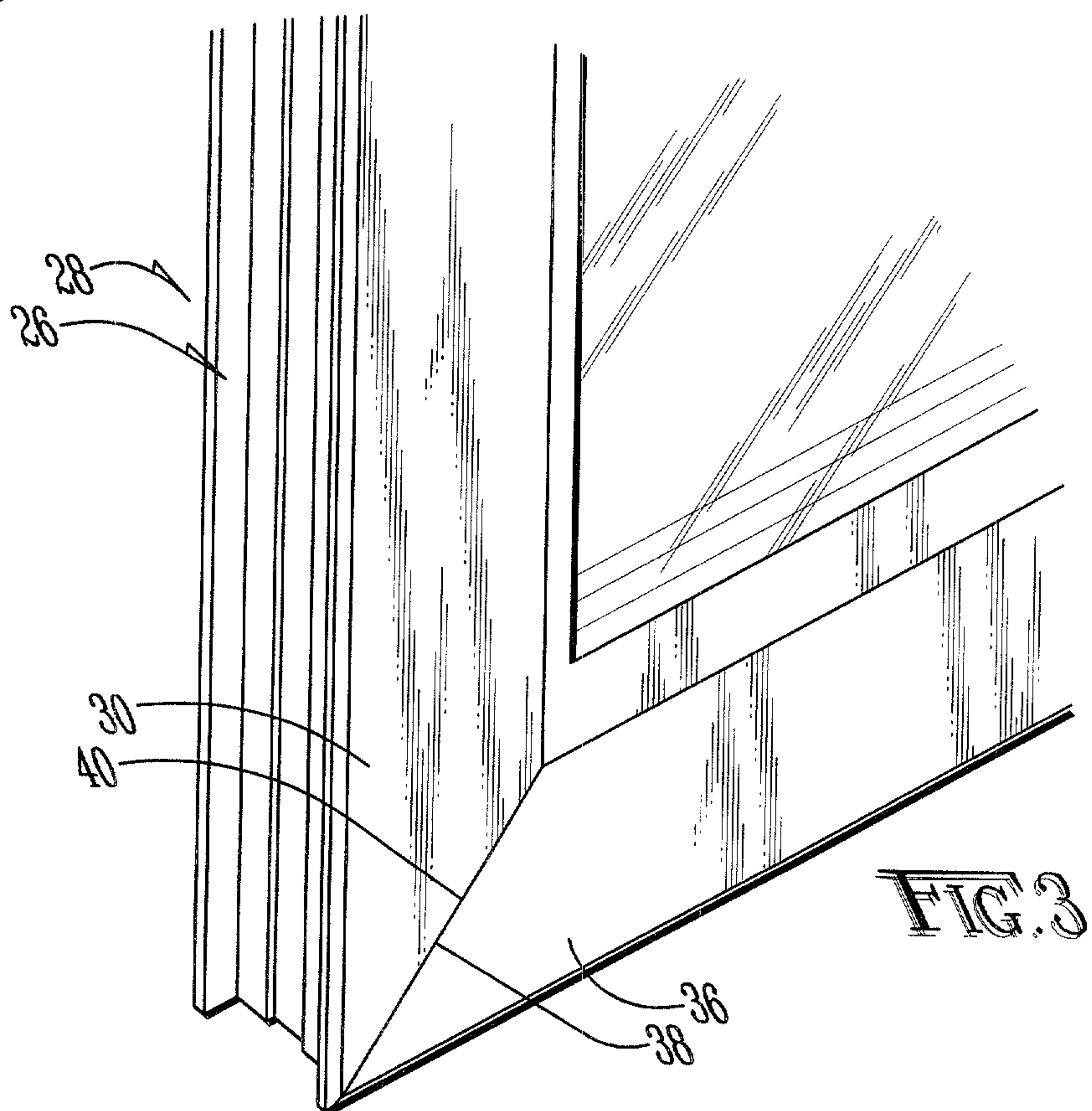
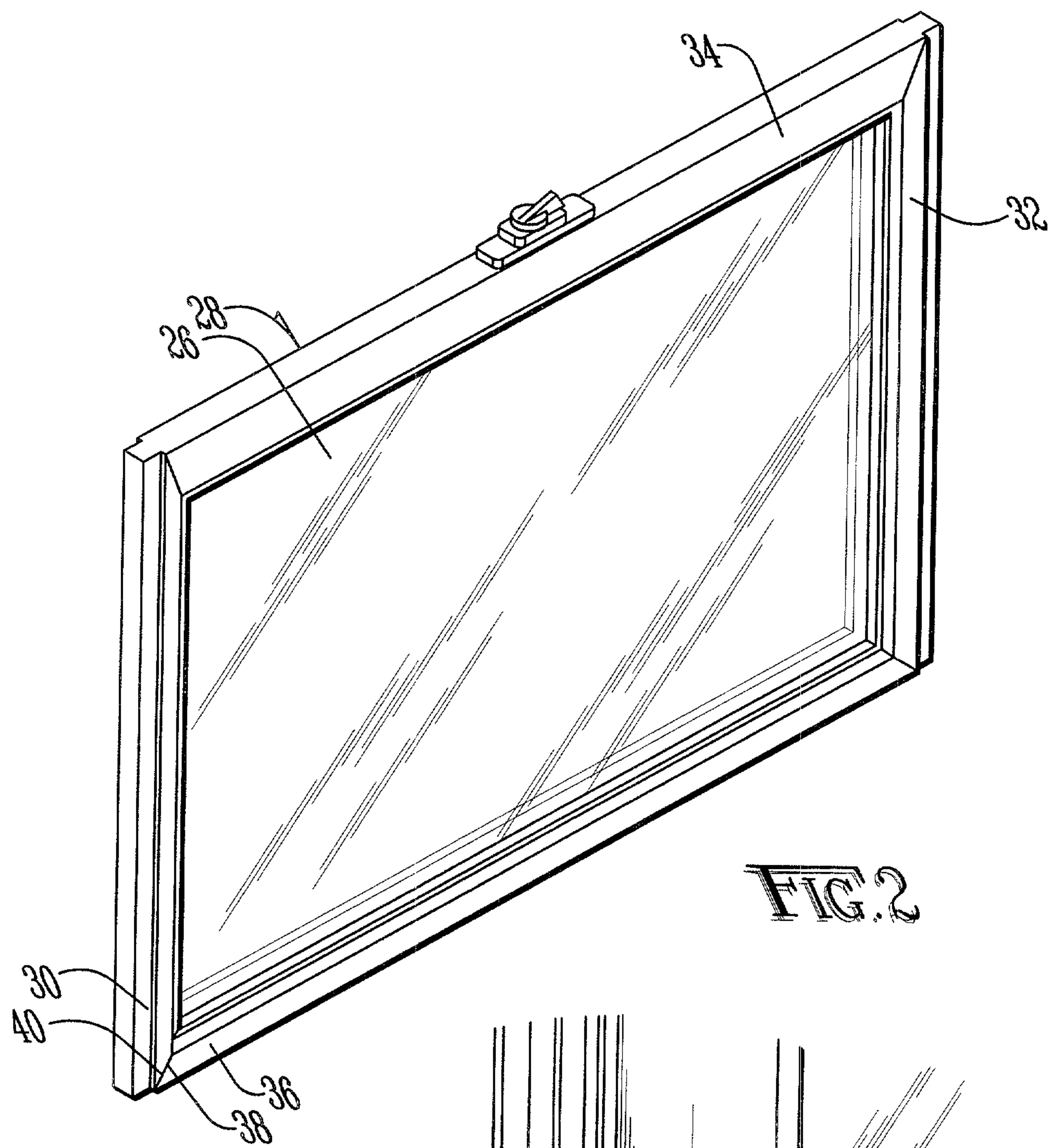
18. The method of sealing a fenestration assembly of Claim 15, further comprising providing a mechanical anchor through said first frame member and into said first
25 longitudinally extending leg.

19. The method of sealing a fenestration assembly of Claim 18, further comprising providing a mechanical anchor through said second frame member and into said second longitudinally extending leg.

20. The method of sealing a fenestration assembly of Claim 15, further comprising
5 providing a plurality of fins on said first longitudinally extending leg.

Smart & Biggar
Ottawa, Canada
Patent Agents





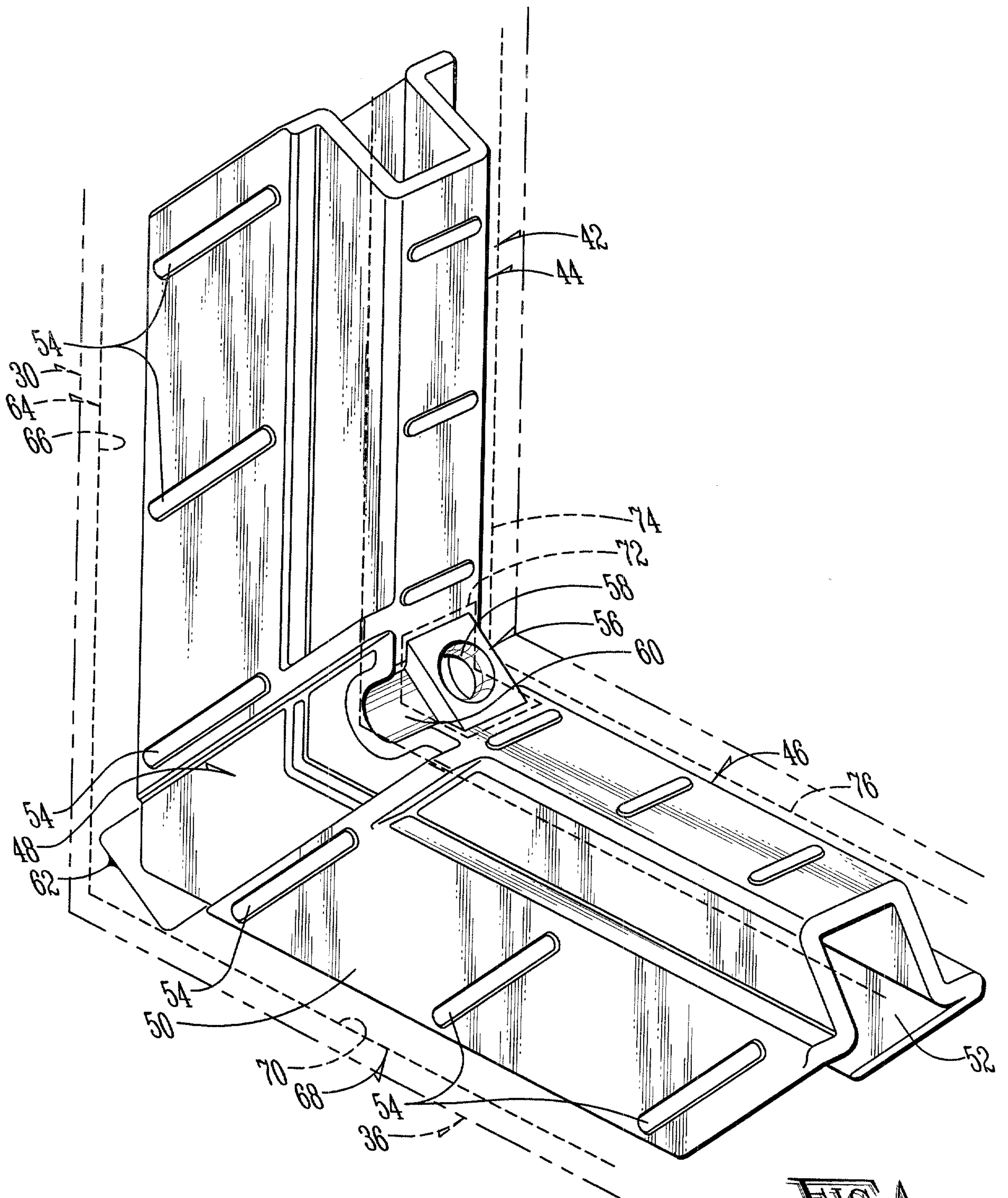


FIG. 4

