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(54) **INWARDLY SWINGING HINGED DOOR ASSEMBLY.**

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## Description

### Background of the Invention

This invention relates generally to an inwardly swinging door and more specifically to an inwardly swinging door that is constructed using a multi-point lock, weatherstripping in one plane and a pressure equalization member to provide for an improved weatherproof door.

### Description of the Prior Art

Most doors utilize a single point lock. When a single point lock is utilized, the door is cooperatively connected to the frame of the door only by means of the hinges and the single point lock. The hinges are typically multi-point and connect the door to the frame at the top, middle and bottom of the door. The multi-point connection helps in the preventing of bowing and hence leakage along the section that is open. However, because the swinging edge of the door is connected only by one point at the lock, bowing of the top and bottom of the door itself is more prevalent. Recently, multi-point locks have been utilized for doors. However, these locks have most often been incorporated into doors for increased security. For example, U.S.-A.-4,548,342 discloses such a lock and is hereby incorporated by reference.

Still further, the prior art doors have been of a "sweep type" design. That is, the weatherstripping on the bottom of the door extended downward and generally came in contact with the threshold. Still further, no pressure equalization chambers were utilized to aid in the prevention of water seeping through the door. Such pressure equalization chambers are in existence for windows. However, the windows are generally outwardly swinging and also the designer of windows is not concerned with stepping up and over threshold as is the designer of doors.

The National Wood Window and Door Association is developing a standard for wood swinging patio doors. As part of the standard with respect to air infiltration, the Association requires that the unit shall be tested for air leakage in accordance with the latest revision of ASTM E-283 "Standard test method for air leakage through exterior windows, curtain, walls and doors." Air infiltration shall not exceed 0.10 cubic metres per minute per square metre (0.34 cubic feet per minute per square foot) overall area when tested at a uniform static air pressure difference of 74.7 Pa (1.56 pounds per square feet). The water penetration resistance in test standard is that the unit shall be tested for water penetration resistance in accordance with ASTM E-547 "Standard test method for penetration

of exterior windows, curtain walls and doors by cyclic air pressure differential." The unit shall be tested under a static pressure difference of 137 Pa (2.86 PSF). A minimum of three cycles of no less than 5 minutes each shall be used during the test. At the conclusion of the test, no water shall have passed beyond the interior face of the door unit and overflowed into the room or flowed into the wall area. The present invention is able to well surpass these standards and in fact air infiltration does not exceed 0.06 cubic metres per minute per square metre (0.20 cubic feet per minute) and the water penetration can be tested under a static air pressure difference of up to 299 Pa (6.24 PSF).

Further, with respect to structural claim testing, the present invention will take a 2874 Pa (60 PSF) positive/negative load using ASTM E-330 with no breakage or unit failure after loads are removed. Residual deflection is less than 0.4% of its span.

US-A-4 716 683, on which the preamble of the present claim 1 is based, discloses a door weatherstripping assembly including a first compressible weatherstripping member mounted on and extending continuously around a door with a compressive bulbous body for compressive sealing engagement between the door and the stop member of the door frame upon closure of the door within the frame. A second flexible weatherstripping member is mounted on and extends around the door forwardly of the first weatherstripping member for providing a rain screen effect upon closure of the door within the frame.

The present invention addresses the problems associated with the prior art and provides for an improved door having increased resistance to air infiltration and water penetration and having better structural characteristics.

The present invention provides an inwardly swinging door assembly for mounting in a frame, the door assembly comprising:

- (a) a door member having a top edge surface, a bottom edge surface, and first and second side edge surfaces;
- (b) means for hingedly mounting said door member to the frame, said mounting means being proximate one of the said first and second side edge surfaces;
- (c) a lock mounted proximate the other of the said first and second side edge surfaces; and
- (d) a continuous single point weatherstrip extending around the door member and having engaging surfaces lying in one plane; **characterized in that:**

the lock is a multi-point lock arranged to engage the frame at more than one point;

the weatherstrip is constituted by strips of single point weatherstrip cooperatively connected to the said top edge surface, bottom edge

surface and first and second side edge surfaces;  
the said strips are the only weatherstrip provided;

a pressure equalization member is cooperatively connected to the frame for engaging said weatherstrip connected to said bottom edge surface; air infiltration of said door assembly, as measured by ASTM E-283, does not exceed 0.10 cubic metres per minute per square metre (0.34 cubic feet per minute per square foot) of said door assembly; and

said door assembly will not allow water penetration, as measured by ASTM E-547, at 137 Pa (2.86 pounds per square foot).

In a preferred embodiment, the weatherstrips are all in a single plane and the weatherstrip is cooperatively connected at intersections of the surfaces, whereby a continuous weatherstrip is formed around the door member.

#### Brief Description of the Drawings

Fig. 1 is a front plan view of the door assembly embodying the present invention.

Fig. 2a is a cross sectional area of the door assembly of Fig. 1, taken generally along the line Fig. 2a-2a.

Fig. 2b is a cross sectional view of the assembly of Fig. 1, taken generally along the lines 2b-2b.

Fig. 2c is a cross sectional view of the assembly of Fig. 1, taken generally along the lines 2c-2c.

Fig. 3a is a cross sectional area of the door assembly of Fig. 1, taken generally along the line Fig. 3a-3a.

Fig. 3b is a cross sectional view of the assembly of Fig. 1, taken generally along the lines 3b-3b.

Fig. 3c is a cross sectional view of the assembly of Fig. 1, taken generally along the lines 3c-3c.

Fig. 4 is an enlarged partial front plan view of a corner of the door member showing the joining of the weatherstrips.

#### Detailed Description of the Invention

Referring to the figures, wherein like numerals represent like parts throughout the several views, there is generally illustrated at 10 an inwardly swinging door assembly.

The door assembly 10 is mounted in a frame 11. As shown in Fig. 1, the frame 11 is sized to receive not only the inwardly swinging door assembly 10 but also a stationary panel member, generally designated as 12. However, it is understood that the door assembly 10 may be mounted alone in a smaller frame or alternately, the frame may be larger to accommodate a plurality of stationary panel members 12. Still further, the position of the door assembly 10 may be varied within the frame

11. For example, where the frame 11 is sized sufficiently to accommodate two stationary panels and a door assembly 10, the door assembly 10 may be on either ends or in the center.

The stationary panel member 12, which is optional to the present invention, may be of any suitable type well known in the industry. The panel member 12 includes a double pane window assembly 12a which consists of an inner glass panel and an outer glass panel cooperatively connected together and mounted to a first side rail 12b, second side rail 12c, top rail 12d and bottom rail 12e. Moldings 13 are cooperatively connected and in turn fastened into the side rails 12b-e by means of nails 14. The molding cooperatively connected to the first side rail 12b is fastened to the portion of the frame 11, as shown in Fig. 2b. Similarly, the molding 13 cooperatively connected to the second side rail 12c is fastened by means of the nail 14 into the center support member 15. Similarly, molding adjacent the top and bottom rails 12d and 12e are fastened into the frame 11 by means of nails. The sill member 16, whose cross section is best seen in Fig. 3c, extends between the two generally vertical members of the frame 11. The sill member 16 comprises a wooden portion 16a cooperatively connected to a metal portion 16b to form the sill 16. A threshold 16c is cooperatively connected to the top of the sill 16. The center support member 15 extends between the sill member 16 and the top horizontal member of the frame 11.

A first side jamb assembly 17 is cooperatively connected adjacent the first side rail 12b and extends between the frame 11 and sill 16. The first side jamb assembly 17 includes a first member 17a cooperatively connected to a second member 17b which forms the outer surface of the door opening. The second member 17b has a C-shaped section 17c which is adapted to receive an optional sliding screen door. Suitable weather stripping 18 is utilized between the first siderail 12b and the second member 17b of the first jamb assembly 17.

A first astragal assembly 19 is cooperatively connected to the center support member 15 and extends between the horizontal upper member of the frame 11 and the sill 16. The astragal assembly 19 includes a first member 19a which is cooperatively connected to the center support member 15 and has a generally planar bottom member which extends beyond the edges of the center support member 15. The ends of the planar bottom 19b are angled slightly upward. The first member also has two upwardly extending members 19c which have a top portion which extends generally outward. The second member 19d of the astragal assembly 19 has a configuration, shown in cross section in Fig. 2a, which is symmetrical on both sides of the

center support member 15. The second member 19d engages the outwardly extending portion of the upwardly extending member 19c and also the stationary panel 12. Suitable weatherstripping 20 may be utilized to weatherproof the stationary panel 12. While the above-described construction of the stationary panel 12 is preferred, it is understood that any suitably constructed stationary panel 12 may be utilized.

The inwardly swinging door assembly 10 includes a door member 10a comprising a double pane assembly 21 mounted in a door panel 22. The door panel 22 has a first side rail 22a, second side rail 22b, top rail 22c, and bottom rail 22d, all cooperatively connected by means well known in the art to form the door panel. Suitable molding strips 23 may be utilized, where appropriate, around the double pane assembly 21. The construction of a door member 20, as described so far, is well known in the art.

The first side rail 22a has an edge surface 24. The second rail 22b has an edge surface 25. The top rail 22c has a top edge surface 26 and the bottom rail 22d has a bottom edge surface 27. As can be seen from the drawings, none of the edge surfaces 24 through 27 are planar. However, the designations for the edge surfaces generally designate the edges of the door member 20. However, as will be discussed more fully hereafter, the edge surfaces have cutouts to accommodate weatherstripping.

Three hinges 28 are cooperatively connected to the center support member 15 and the door member 20, proximate the edge surface 24 by means well known in the art. The door assembly 10 is hingedly mounted for swinging inward into a building. The door assembly 10 also includes a multi-point closing and locking latch assembly generally designated as 29. The locking assembly 29, as shown, includes three separate locking sub assemblies 30, 31 and 32. The locking sub assemblies are interconnected by means of an espagnolette bar 33. Rotation of the handle 34 will cause the locking assembly 29 to move between a latched and unlatched position. Rotation of the handle 34 causes all three sub assemblies to move between the latched and unlatched position. Further, by inserting a key and rotating the key into a lock 35, the locking assembly 29 may be locked by moving the bolt 29a into a strike plate 49. Locking assemblies 29 are well-known in the art, but to date have essentially been used for improved security. The multi-point locking assembly 29, with the three locking sub assemblies 30 through 32 provide for increased protection against a forced entry. However, such a locking assembly 29 also has significant advantages with respect to the weather integrity of the door. By latching the door at 30 and 32

as well as at 31, the door is secured along three points. This will prevent bowing of the door at the top and bottom as well as maintain the integrity of the weatherseal proximate the locking sub assemblies 30 through 32. Such a latch assembly is described in U.S.-A-4,548,432, and is hereby incorporated by reference. Further, such a locking assembly 29 is available for purchase from Fixfabriken in Gotenberg, Sweden. The oval lines shown in phantom 60, 61 and 62 in Figs. 3a, 3b and 3c, respectively, show the locations of where the locking sub assemblies 30, 31 and 32 are positioned.

The weatherstripping, generally designated as 36, as will be described more fully hereafter, is cooperatively connected to the edge surfaces 24 through 27 on the door member 20. The weatherstripping 36 comprises four sections 36a through d and are carried entirely by the door member 20 and further are in one plane. Still further, the sections are cooperatively connected at the intersections to form one continuous weatherstrip around the door. The weatherstripping 36 can be seen in detail in Figs. 2a, 2c, 3a and 3c. As seen in Fig. 2a, the first edge surface 24 has a notched area in which the weatherstrip 36a is fastened. Weatherstrip section 36a, as with the other sections, is a bulb type weatherstrip and has a first end 36e secured in a cavity 37 in door panel 22a. The section 36a has a protruding bulb section 36f, which is shown in a compressed configuration in Fig. 2a. The bulb section then continues and is again cooperatively connected into the cavity 37. The astragal assembly 19 has a weatherstrip engaging surface 19e that comes in contact with the bulb portion 36f of the section 36a.

As seen in Fig. 2c, the second edge surface 25 has a notched area in which the weatherstrip 36b is fastened. Weatherstrip section 36b is a bulb-type weatherstrip and has a first end 36g secured in a cavity 38 in door panel 22b. The section 36b has a protruding bulb section 36h, which is shown in a compressed configuration in Fig. 2c. The bulb section then continues and is again cooperatively connected into the cavity 38. A second side jamb assembly 48 is similar to the first side jamb assembly 17. The second side jamb assembly 48 is cooperatively connected to the frame 11 and is proximate the side rail 22b and extends between the frame 11 and sill 16. The second side jamb assembly 48 includes a first member 48a cooperatively connected to a second member 48b which forms the outer surface of the door opening. The second member 48b has a C-shaped section 48c which is adapted to receive an optional sliding screen door. The second side jamb assembly 48 also includes a flange 48d which in turn has a generally perpendicular cross section piece 48e.

The cross section piece 48e forms a weatherstrip engaging surface which contacts the bulb portion 36h of the weatherstrip section 36b.

As seen in Fig. 3a, the edge surface 26 has a notched area in which the weatherstrip 36c is fastened. Weatherstrip section 36c is a bulb-type weatherstrip and has a first end 36i secured in a cavity 39 in the door panel 22c. The section 36c has a protruding bulb section 36j, which is shown in a compressed configuration in Fig. 3a. The bulb section then continues and is again cooperatively connected into the cavity 39. A top jamb assembly 50 as shown in Fig. 3a is cooperatively connected to the frame 11 and is proximate the top rail 22c and extends between the generally vertical upright members of the frame 11. The top jamb assembly 50 includes a first member 51 cooperatively connected to a second member 52. The second member 52 is adjacent and cooperatively connected to the frame 11, as previously discussed. The second member 52 includes a downwardly depending member 52a which forms a weatherstrip engaging surface which contacts the bulb portion 36j of weatherstrip section 36i. An optional assembly 53 may be attached to the top jamb assembly 50 when an optional screen is utilized.

As seen in Fig. 3c, the edge surface 27 has a notched area in which the weatherstrip 36d is fastened. Weatherstrip section 36d is a bulb-type weatherstrip and has a first end 36k secured in a cavity 40 in the door panel 22d. The section 36d has a protruding bulb section 36l, which is shown in a compressed configuration in Fig. 3c. The bulb section then continues and is again cooperatively connected into the cavity 40.

The metal sill portion 16b has a downwardly sloping top surface 16d and two generally upright support members 16e and 16f. Further, the sill portion 16b extends past the support member 16e and has a further top surface 16g on which a guide 41 for a screen door may optionally be secured. At one end of the top surface 16d, an upwardly extending mounting member 16h is formed. A pressure equalization member, generally designated as 42, is cooperatively connected to the mounting member 16h of the middle sill 16b. The pressure equalization chamber extends the entire width between the frame 11 and the center support member 15. The pressure equalization member 42 has a first vertical member 43. The bottom end of the first vertical member 43 rests on the sill 16b. The height of the member 43 is greater than the pressure head that has to be withstood, approximately 38mm (1-1/2 inches). A second generally vertical member 44 has a bottom portion which engages the mounting member 16h. A horizontal section 45 is cooperatively connected between the first and second vertical sections 43 and 44. The second

vertical member 44 has a weatherstrip engaging surface 44a that comes in contact with the weatherstrip 36d and forms the weatherseal. The top portion of the pressure equalization member 42 forms a generally U-shaped trough. This U-shaped trough has a plurality of drain holes 46 spaced along its length. The pressure equalization member 42 also has an inverted U-shaped area which has a plurality of drain holes 47 spaced along its length. A water shed member 55 has a first member 55a which extends across the width of the door member 10a and is cooperatively connected to the bottom rail 22d and an outwardly and downwardly extending section 55b which acts as a water shed for any water which cascades down the outer surface of the door 10a, to prevent access of the cascading water into the pressure equalization member 42.

All four of the weatherstrip engaging surfaces 19e, 44a, 52a and 48e of the door assembly 10 are in the same plane.

Fig. 4 is a front plan view of one corner section of the door 10a. The four weatherstrip segments are cooperatively connected at the intersections to form a continuous weatherstrip around the door member. Only one corner of the door 10a is shown in detail, but the other four sections are similarly constructed. Fig. 4 shows that the bulb sections 36j and 36h are cooperatively connected along a seam 70 to form one continuous weatherstrip.

Applicants have found that by utilizing the multi point lock in connection with weatherstripping cooperatively connected on all four sides to the door and a pressure equalization chamber that the door assembly is able to meet the qualifications as set forth in the description of the prior art in this application. The weatherstrip of the present invention is kept up off the ground and accordingly stays dryer than the weatherstrip of the prior art. The prior art often puts weatherstrip on the outside and the weatherstrip then becomes wet and air infiltration and water are then more easily able to pass through the weatherstrip barrier.

Other modifications of the invention will be apparent to those skilled in the art in light of the foregoing description. This description is intended to provide specific examples of individual embodiments or the use of elements having specific configurations and shapes as presented herein. All alternative modifications and variations of the present invention which follow in the scope of the appended claims are included.

## Claims

1. An inwardly swinging door assembly (10) for mounting in a frame (11), the door assembly comprising (10):

(a) a door member (10a) having a top edge surface (26), a bottom edge surface (27), and first and second side edge surfaces (24, 25);

(b) means (28) for hingedly mounting said door member (10a) to the frame (11), said mounting means (28) being proximate one of the said first and second side edge surfaces (24, 25);

(c) a lock (29) mounted proximate the other of the said first and second side edge surfaces (24, 25); and

(d) a continuous single point weatherstrip (36) extending around the door member (10a) and having engaging surfaces lying in one plane; **characterized in that:**

the lock (29) is a multi-point lock arranged to engage the frame (11) at more than one point;

the weatherstrip (36) is constituted by strips (36a, 36b, 36c, 36d) of single point weatherstrip cooperatively connected to the said top edge surface (26), bottom edge surface (27) and first and second side edge surfaces (24, 25);

the said strips (36a, 36b, 36c, 36d) are the only weatherstrip provided;

a pressure equalization member (42) is cooperatively connected to the frame (11) for engaging said weatherstrip (36d) connected to said bottom edge surface;

air infiltration of said door assembly (10), as measured by ASTM E-283, does not exceed 0.10 cubic metres per minute per square metre (0.34 cubic feet per minute per square foot) of said door assembly (10); and

said door assembly (10) will not allow water penetration, as measured by ASTM E-547, at 137 Pa (2.86 pounds per square foot).

2. A door assembly as claimed in claim 1, wherein the lock (29) is a three point lock.

3. A door assembly as claimed in claim 1 or claim 2, wherein the said weatherstrips (36a, 36b, 36c, 36d) are in one plane.

4. A door assembly as claimed in any preceding claim, wherein the said weatherstrip (36) is cooperatively connected at intersections of said surfaces (24, 25, 26, 27) to thereby form said continuous weatherstrip (36) around said door member (10a).

5. A door assembly as claimed in any preceding claim, wherein said pressure equalization

member (42) has first (43) and second (44) vertical sections and a horizontal section (45) cooperatively connected to said vertical sections (43, 44).

6. A door assembly as claimed in claim 5, wherein the said horizontal section (45) has drain holes (46) formed therein and said first vertical section (43) has drain holes (47) formed therein.

7. A door assembly as claimed in claim 6, wherein the said first (43) and second (44) vertical sections are spaced apart from said bottom edge surface (27).

8. A door assembly as claimed in claim 6 or claim 7, wherein the said bottom edge surface (27) has an upper face and lower face cooperatively connected by a generally upright vertical face, and said weatherstripping (36) is cooperatively connected to said vertical face, said bottom surface (27), and said weatherstripping (36) connected to said vertical face engages said second vertical section (44).

9. A door assembly as claimed in any preceding claim, wherein a water shed member (55b) is cooperatively connected to the door member (10a) to prevent water which may cascade down the door member (10a) from entering the pressure equalization member (42).

10. A door assembly as claimed in any preceding claim, wherein the door assembly (10) will withstand a 2873 PA (60 PSF) positive/negative load when measured using ASTM E-330.

11. A door assembly as claimed in any preceding claim, wherein the said air infiltration does not exceed 0.06 cubic metres per minute per square metre (0.20 cubic feet per minute).

12. A door assembly as claimed in any preceding claim, wherein said door assembly (10) will pass ASTM E-547 at 299 Pa (6.24 pounds per square foot).

13. A door assembly as claimed in any preceding claim, wherein said weatherstrip (36) comprises bulb weatherstrips (36a, 36b, 36c, 36d).

14. A door assembly as claimed in any preceding claim, wherein the lock (29) engages the frame (11) through said other of said first and second side edge surfaces (24, 25).

## Patentansprüche

1. Einwärts schwingende drehbare Türvorrichtung (10) zur Montage in einem Rahmen (11), wobei die Türvorrichtung umfaßt:
  - (a) einen Türkörper (10a) mit einer oberen Randfläche (26), einer unteren Randfläche (27), und einer ersten und zweiten seitlichen Randfläche (24, 25);
  - (b) Mittel (28) zur schwenkbaren Montage des besagten Türkörpers (10a) am Rahmen (11), wobei die besagten Montagemittel (28) nahe der besagten ersten und zweiten seitlichen Randflächen (24, 25) liegen;
  - (c) ein Schloß (29), das in der Nähe der anderen der besagten ersten und zweiten seitlichen Randflächen (24, 25) montiert ist; und
  - (d) eine ununterbrochene Einpunkt-Wetterleiste (36), die um den Türkörper (10a) herumläuft und Andruckflächen hat, die in einer Ebene liegen; dadurch gekennzeichnet, daß das Schloß (29) ein Mehrpunktschloß ist, das so eingerichtet ist, daß es an mehr als einem Punkt in den Rahmen (11) eingreift; die Wetterleiste (36) aus Streifen (36a, 36b, 36c, 36d) von Einpunkt-Wetterleisten besteht, die in zusammenwirkender Weise mit der besagten oberen Randfläche (26), unteren Randfläche (27) und der ersten und zweiten seitlichen Randfläche (24, 25) verbunden sind; die besagten Streifen (36a, 36b, 36c, 36d) die einzig vorhandene Wetterleiste bilden; ein Druckausgleichsteil (42) zusammenwirkend mit dem Rahmen (11) verbunden ist, um mit der besagten Wetterleiste (36d) zusammenzuwirken, die mit der besagten unteren Randfläche verbunden ist; der Luftdurchzug der besagten Türvorrichtung (10), wie durch ASTM E-283 gemessen, 0,10 Kubikmeter pro Minute und pro Quadratmeter (0,34 Kubikfuß pro Minute und pro Quadratfuß) der besagten Türvorrichtung nicht überschreitet; und besagte Türvorrichtung (10) das Durchdringen von Wasser verhindert, wie in ASTM E-547 bei 137 Pa (2,86 Pounds pro Quadratfuß) gemessen.
2. Türvorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Schloß (29) ein Dreipunktschloß ist.
3. Türvorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die besagten Wetterleisten (36a, 36b, 36c, 36d) in einer Ebene liegen.
4. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die besagte Wetterleiste (36) an den Schnittpunkten der besagten Flächen (24, 25, 26, 27) zusammenwirkend verbunden ist, um dadurch die besagte, ununterbrochene Wetterleiste (36) um den besagten Türkörper (10a) herum auszubilden.
5. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das besagte Druckausgleichsteil (42) erste (43) und zweite (44) senkrechte Abschnitte und einen horizontalen Abschnitt (45) hat, der mit den besagten senkrechten Abschnitten (43, 44) zusammenwirkend verbunden ist.
6. Türvorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß der besagte horizontale Abschnitt (45) darin ausgebildete Abflußlöcher (46) aufweist und daß der besagte erste horizontale Abschnitt (43) darin ausgebildete Abflußlöcher (47) aufweist.
7. Türvorrichtung nach Anspruch 6, dadurch gekennzeichnet, daß die besagten ersten (43) und zweiten (44) senkrechten Abschnitte mit Abstand von der besagten unteren Randfläche (27) angeordnet sind.
8. Türvorrichtung nach Anspruch 6 oder 7, dadurch gekennzeichnet, daß die besagte untere Randfläche (27) eine obere und eine untere Seite hat, die durch eine im wesentlichen senkrechte Fläche zusammenwirkend verbunden sind, und besagte Wetterleiste (36) zusammenwirkend mit der besagten senkrechten Fläche und der besagten unteren Randfläche (27) zusammenwirkend verbunden ist, und besagte Wetterleiste (36), die mit der besagten senkrechten Fläche verbunden ist, an den besagten zweiten senkrechten Abschnitt (44) greift.
9. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß ein Wasserschutzteil (55b) zusammenwirkend mit dem Türkörper (10a) verbunden ist, um zu verhindern, daß Wasser, das am Türkörper (10a) herunterlaufen kann, in das Druckausgleichsteil (42) eintritt.
10. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die Türvorrichtung (10) einer positiven/negativen Last von 2873 PA (60 PSF) bei Messung nach ASTM E-330 gemessen wird.

11. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß der besagte Luftdurchzug 0,06 Kubikmeter pro Minute und pro Quadratmeter (0,20 Kubikfuß pro Minute) nicht überschreitet. 5
12. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß die besagte Türvorrichtung (10) eine Prüfung nach ASTM E-547 bei 299 Pa (6,24 Pounds pro Quadratfuß) besteht. 10
13. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß der besagte Wetterstreifen (36) wulstförmige Wetterstreifen (36a, 36b, 36c, 36d) umfaßt. 15
14. Türvorrichtung nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß das Schloß (29) durch die besagte andere der besagten ersten und zweiten seitlichen Randflächen (24, 25) in den Rahmen (11) eingreift. 20

#### Revendications

1. Un ensemble de porte pivotant vers l'intérieur (10) destiné à être monté dans un encadrement (11), l'ensemble de porte (10) comprenant : 25
- (a) un élément de porte (10a) pourvu d'une surface de bord supérieur (26), d'une surface de bord inférieur (27) et d'une première et d'une deuxième surfaces de bords latéraux (24, 25); 30
- (b) un moyen de montage (28) à charnière dudit élément de porte (10a) sur l'encadrement (11), ledit moyen de montage (28) étant voisin de l'une desdites première et deuxième surfaces de bords latéraux (24, 25); 35
- (c) un verrou (29) monté près de l'autre desdites première et deuxième surfaces de bords latéraux (24, 25); et 40
- (d) un joint d'étanchéité continu à point unique (36) s'étendant autour de l'élément de porte (10a) et pourvu de surfaces de contact situées dans un plan; **caractérisé en ce que :** 45
- le verrou (29) est un verrou à points multiples agencé pour venir en prise en plus d'un point avec l'encadrement (11); 50
- le joint d'étanchéité (36) est constitué par des bandes (36a, 36b, 36c, 36d) de joint d'étanchéité à point unique reliés de manière coopérante à ladite surface de bord supérieur (26), à ladite surface de bord inférieur (27) et auxdites première et deuxième surfaces de bords latéraux (24, 55

25);

lesdites bandes (36a, 36b, 36c, 36d) constituent le seul joint d'étanchéité réalisé;

un élément d'égalisation de pression (42) est relié de façon coopérante à l'encadrement (11) pour venir en contact avec ledit joint d'étanchéité (36d) relié à ladite surface de bord inférieur;

une infiltration d'air par ledit ensemble de porte (10), mesurée selon l'essai ASTM E-283, ne dépasse pas 0,10 mètre cube par minute par mètre carré (0,34 pied cube par minute par pied carré) dudit ensemble de porte (10); et

ledit ensemble de porte (10) ne permet aucune pénétration d'eau à 137 Pa (2,86 livres par pied carré) selon la mesure de l'essai ASTM E-547.

2. Un ensemble de porte selon la revendication 1, dans lequel le verrou (3) est un verrou à trois points.
3. Un ensemble de porte selon la revendication 1 ou la revendication 2, dans lequel les joints d'étanchéité (36a, 36b, 36c, 36d) sont dans un plan.
4. Un ensemble de porte selon une revendication précédente quelconque, dans lequel ledit joint d'étanchéité (36) est relié de façon coopérante à des intersections desdites surfaces (24, 25, 26, 27) afin de former ainsi ledit joint d'étanchéité continu (36) autour dudit élément de porte (10a).
5. Un ensemble de porte selon une revendication précédente quelconque, dans lequel ledit élément d'égalisation de pression (42) comprend une première (43) et une deuxième (44) sections verticales et une section horizontale (45) reliée de façon coopérante auxdites sections verticales (43, 44).
6. Un ensemble de porte selon la revendication 5 dans lequel des trous de drainage (46) sont ménagés dans ladite section horizontale (45) et des trous de drainage (47) sont ménagés dans ladite première section verticale (43).
7. Un ensemble de porte selon la revendication 6, dans lequel lesdites première (43) et deuxième (44) sections verticales sont espacées de ladite surface de bord inférieur (27).
8. Un ensemble de porte selon la revendication 6 ou la revendication 7, dans lequel ladite surface de bord inférieur (27) comprend une face



supérieure et une face inférieure reliées de façon coopérante par une face généralement dressée à la verticale, et ledit joint d'étanchéité (36) est relié de façon coopérante à ladite face verticale de ladite surface de bord inférieur (27), et ledit joint d'étanchéité (36) relié à ladite face verticale vient en contact avec ladite deuxième section verticale (44). 5

9. Un ensemble de porte selon une revendication précédente quelconque, dans lequel un élément formant auvent (55b) est relié de façon coopérante à l'élément de porte (10a) pour empêcher l'eau qui peut tomber en cascade le long de l'élément de porte (10a) d'entrer dans l'élément d'égalisation de pression (42). 10  
15
10. Un ensemble de porte selon une revendication précédente quelconque, dans lequel l'ensemble de porte (10) résiste à une charge positive/négative de 2873 PA (60 PSF) selon la mesure de l'essai ASTM E-330. 20
11. Un ensemble selon une revendication précédente quelconque, dans lequel ladite infiltration d'air ne dépasse pas 0,06 mètre cube par minute par mètre carré (0,20 pied cube par minute). 25
12. Un ensemble de porte selon une revendication précédente quelconque, dans lequel ledit ensemble de porte (10) répond à l'essai ASTM E-547 à 299 Pa (6,24 livres par pied carré). 30
13. Un ensemble de porte selon une revendication précédente quelconque, dans lequel ledit joint d'étanchéité (36) comprend des joints d'étanchéité à bourrelets (36a, 36b, 36c, 36d). 35
14. Un ensemble de porte selon une revendication précédente quelconque, dans lequel le verrou (29) vient en prise avec l'encadrement (11) au moyen de ladite autre desdites première et deuxième surfaces de bords latéraux (24, 25). 40

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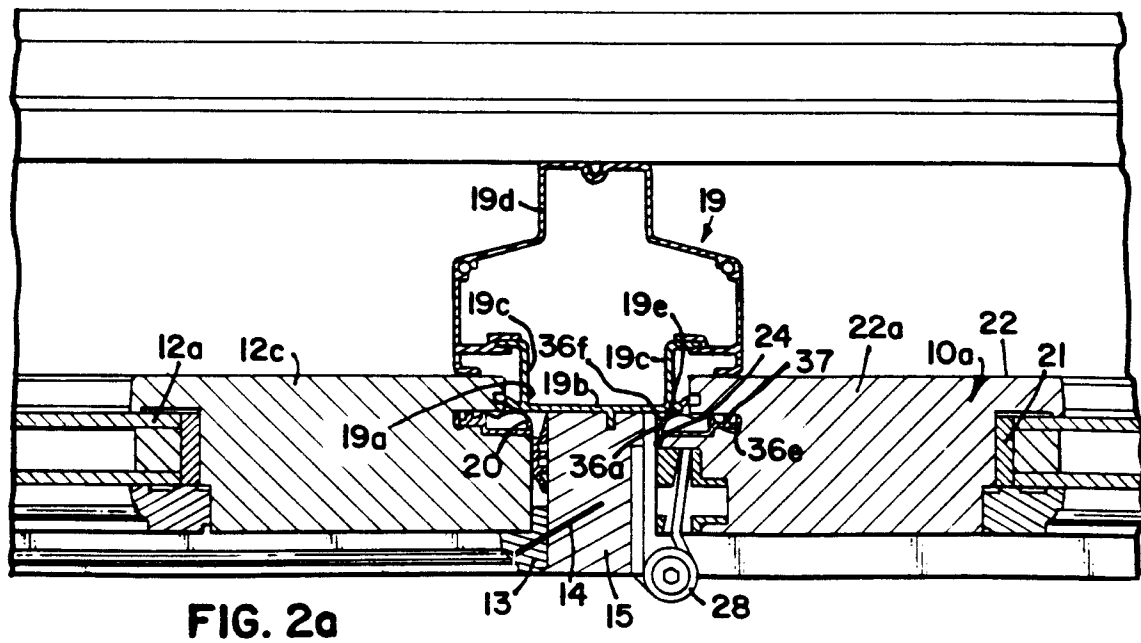
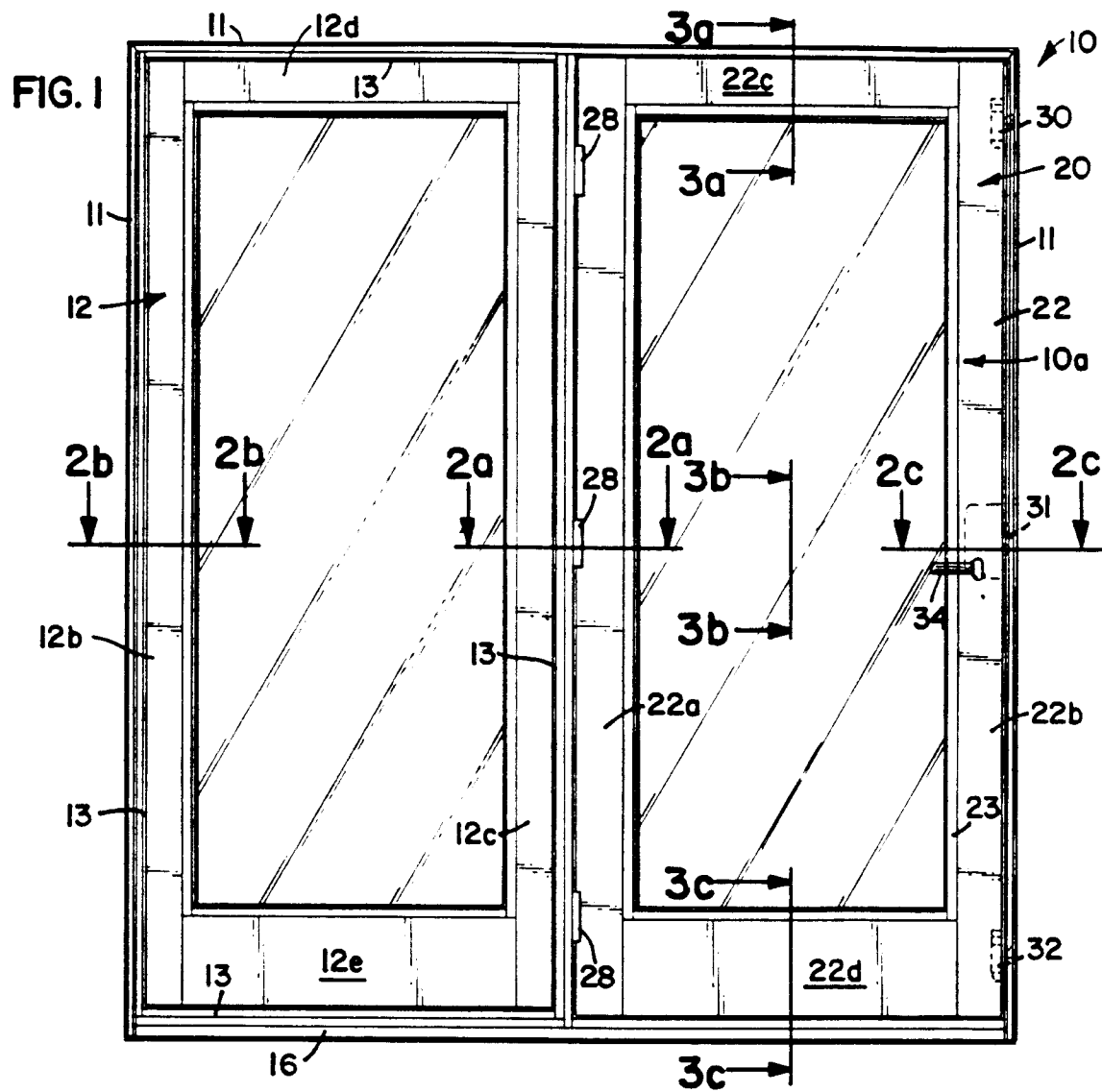


FIG. 2b

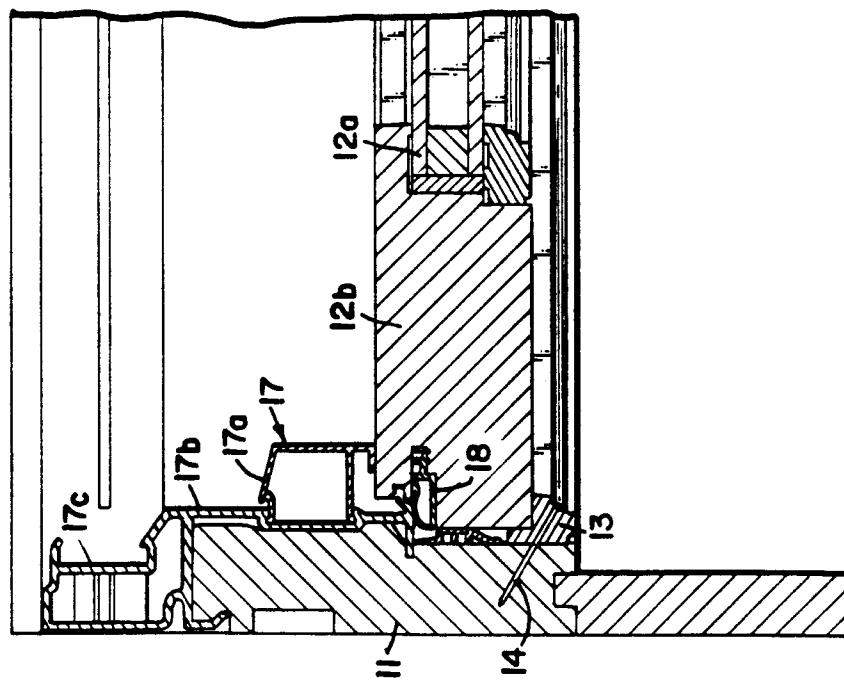


FIG. 2c

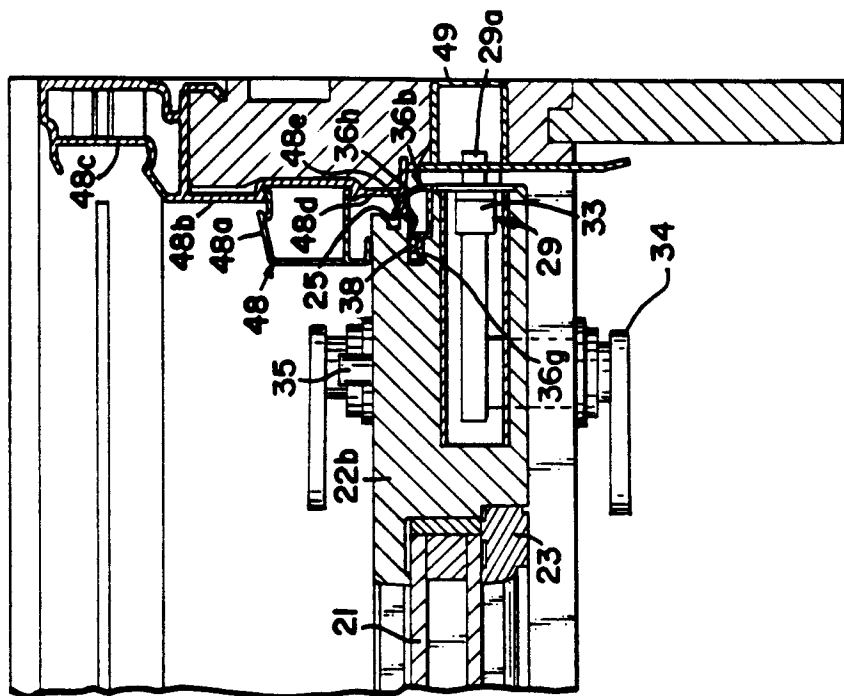


FIG. 3a

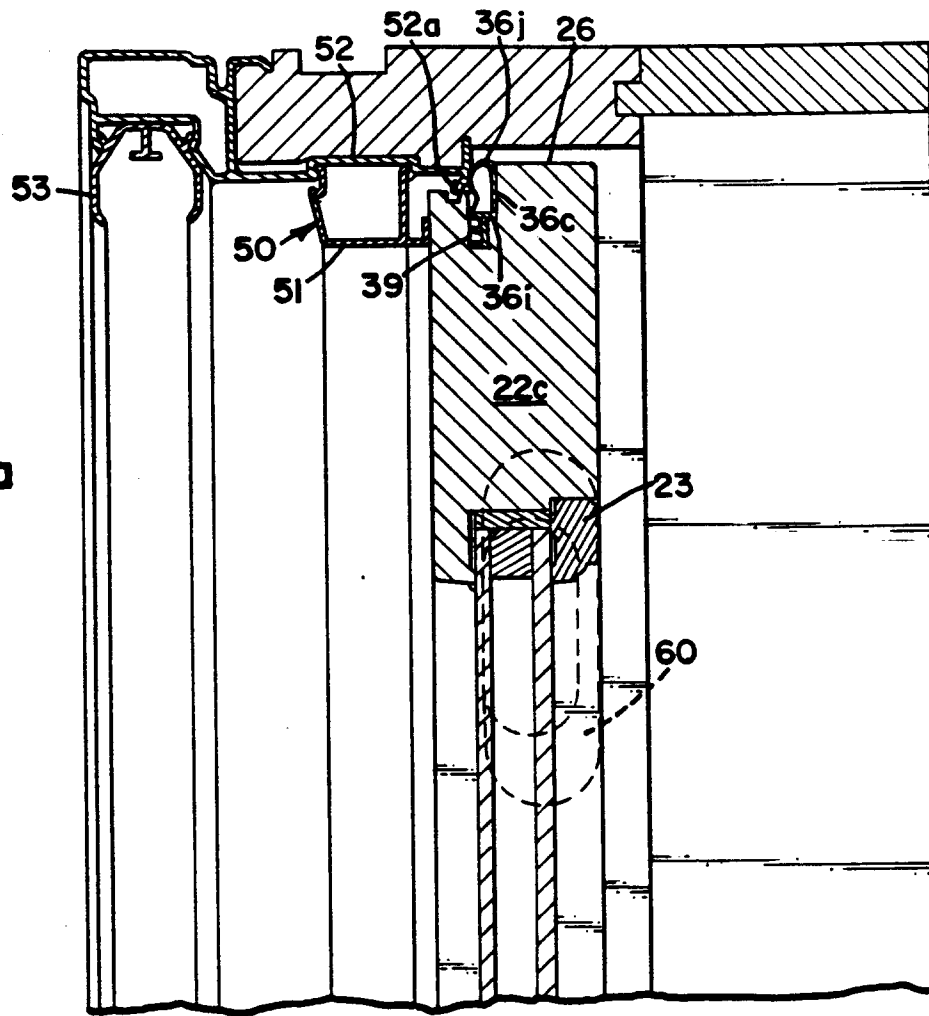


FIG. 3b

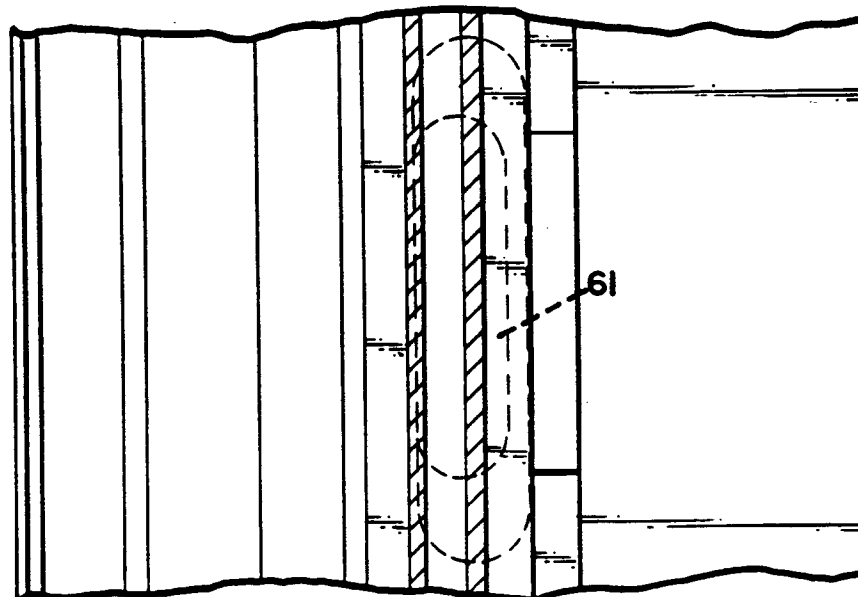


FIG. 3c

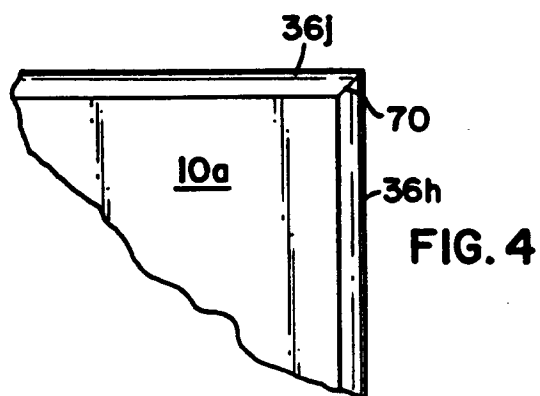
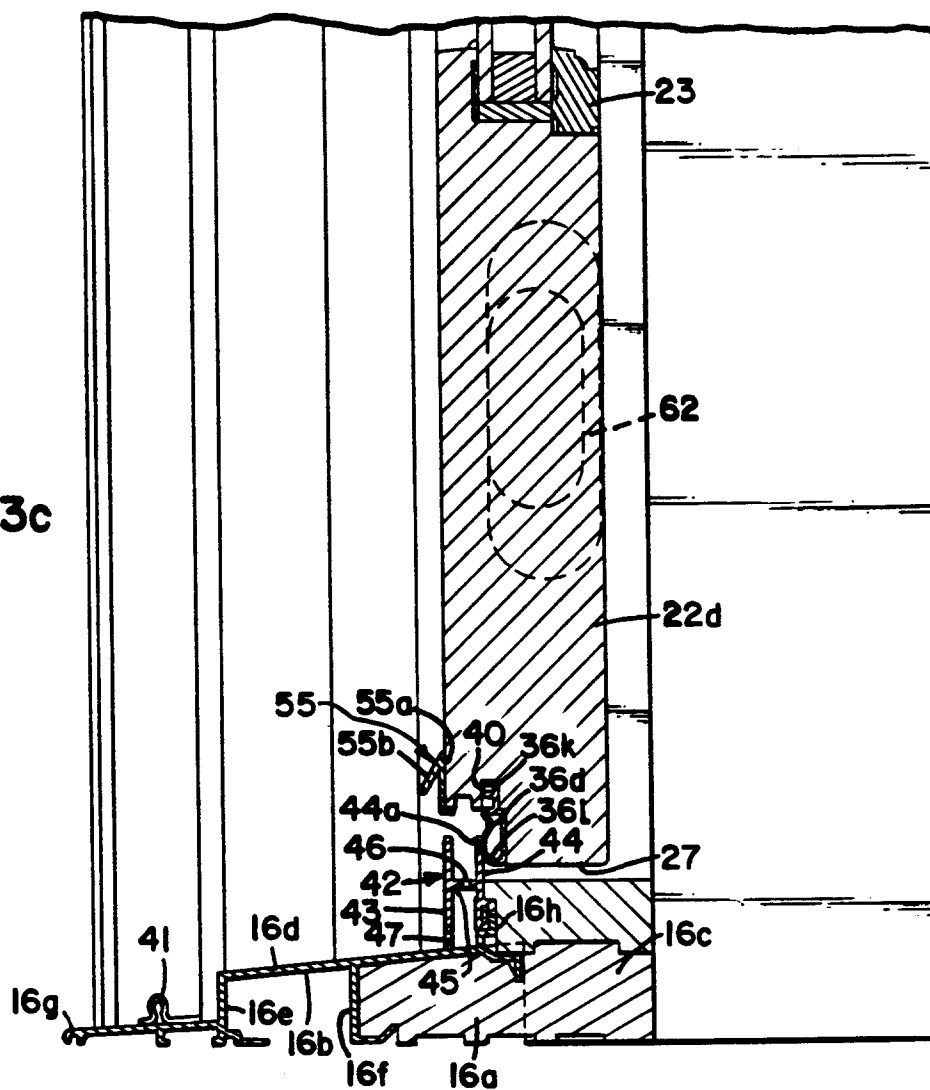


FIG. 4