



(86) Date de dépôt PCT/PCT Filing Date: 2005/12/14

(87) Date publication PCT/PCT Publication Date: 2006/06/29

(45) Date de délivrance/Issue Date: 2010/02/09

(85) Entrée phase nationale/National Entry: 2007/05/09

(86) N° demande PCT/PCT Application No.: US 2005/045484

(87) N° publication PCT/PCT Publication No.: 2006/068924

(30) Priorité/Priority: 2004/12/20 (US11/017,067)

(51) Cl.Int./Int.Cl. *E06B 1/62* (2006.01)

(72) Inventeurs/Inventors:

O'ROURKE, BARBARA KLIMOWICZ, US;
KATSAROS, JAMES DEAN, US

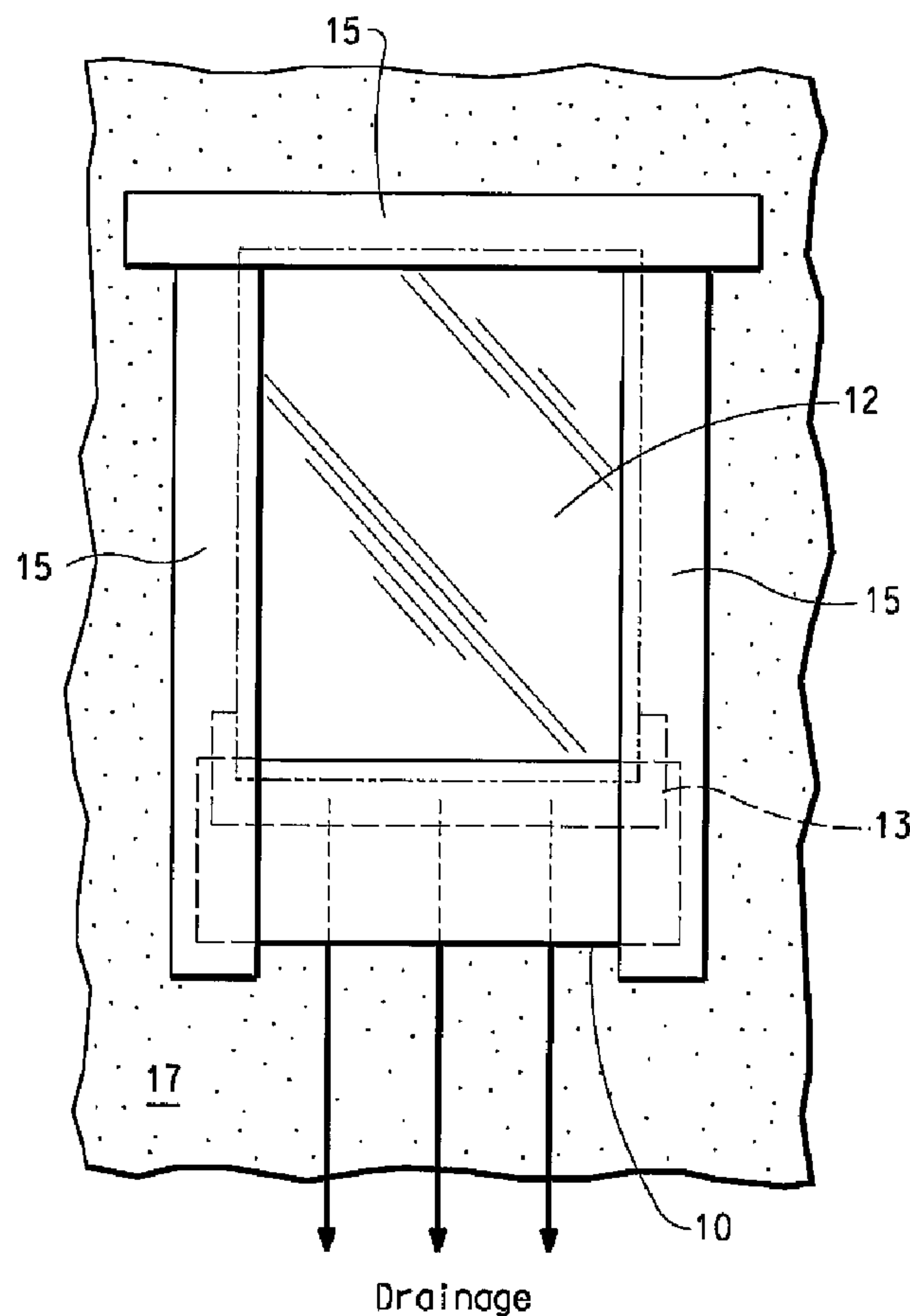
(73) Propriétaire/Owner:

E.I. DU PONT DE NEMOURS AND COMPANY, US

(74) Agent: TORYS LLP

(54) Titre : PROCEDE D'ETANCHEMENT UTILISANT UNE COLLERETTE BLOQUANT L'INFILTRATION D'AIR

(54) Title: FLASHING METHOD USING AIR INFILTRATION BLOCKING SKIRT



(57) Abrégé/Abstract:

An air infiltration blocking skirt comprising a weather resistant sheet material is attached to the lower portion of a window to be installed in a wall opening the full width of the opening and sufficiently long to extend over the wall immediately below the window.

(57) **Abrégé(suite)/Abstract(continued):**

The skirt is sealed to the wall along both the left and right sides of the skirt while the bottom edge remains unsealed. The skirt prevents wind-driven rain and air from penetrating the window-wall interface while allowing moisture to drain therethrough.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
29 June 2006 (29.06.2006)

PCT

(10) International Publication Number
WO 2006/068924 A3(51) International Patent Classification:
E06B 1/62 (2006.01)(21) International Application Number:
PCT/US2005/045484(22) International Filing Date:
14 December 2005 (14.12.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/017,067 20 December 2004 (20.12.2004) US(71) Applicant (for all designated States except US): **E. I. DU PONT DE NEMOURS AND COMPANY** [US/US]; 1007 Market Street, Wilmington, Delaware 19898 (US).

(72) Inventors; and

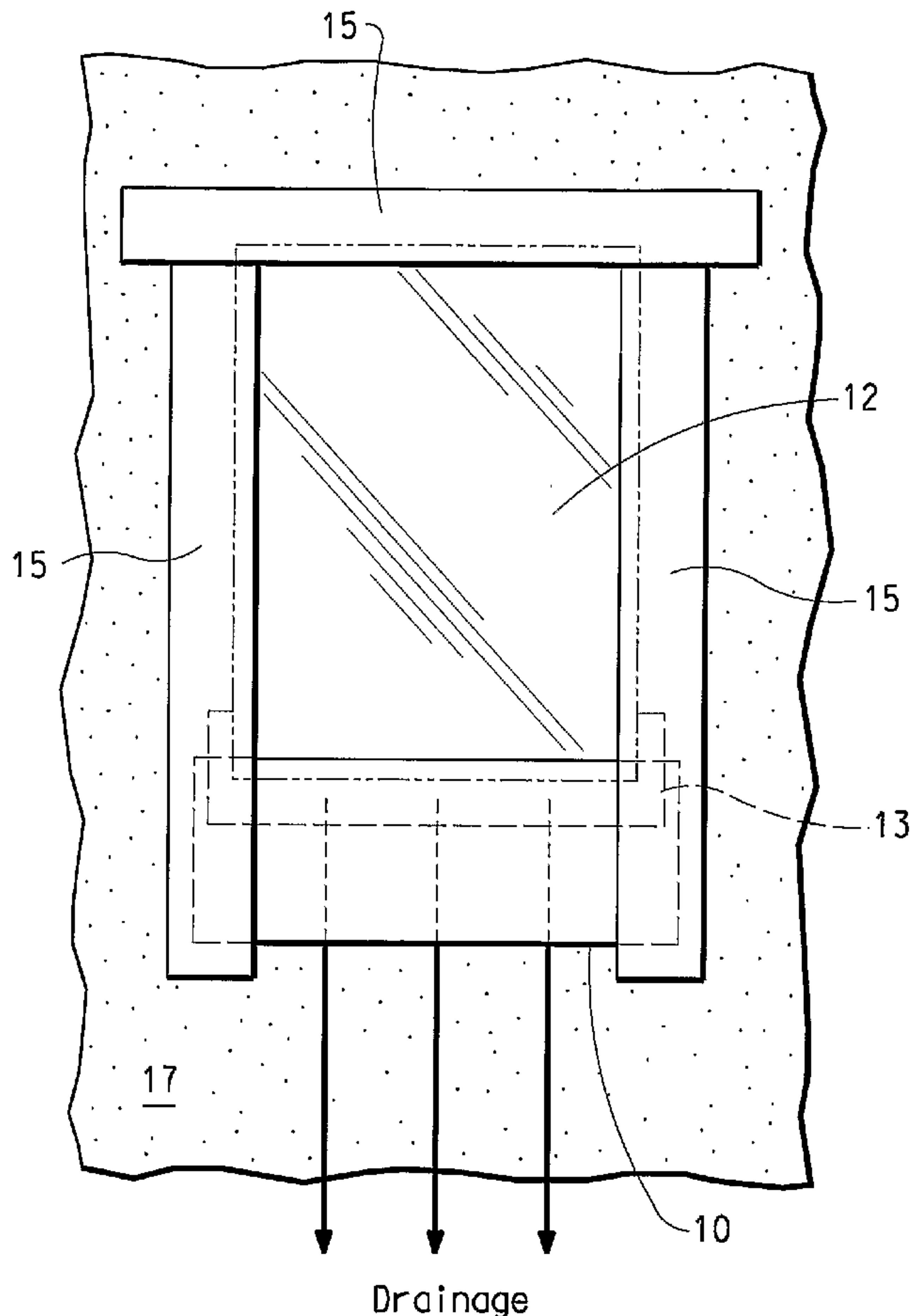
(75) Inventors/Applicants (for US only): **O'ROURKE, Barbara, Klimowicz** [US/US]; 8903 Rams Crossing Court, Richmond, Virginia 23236 (US). **KATSAROS, James, Dean** [US/US]; 2501 Follensbee Drive, Midlothian, Virginia 23113 (US).(74) Agent: **STRICKLAND, Frederick, D.**; E. I. DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, 4417 Lancaster Pike, Wilmington, Delaware 19805 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,

[Continued on next page]

(54) Title: FLASHING METHOD USING AIR INFILTRATION BLOCKING SKIRT



(57) Abstract: An air infiltration blocking skirt comprising a weather resistant sheet material is attached to the lower portion of a window to be installed in a wall opening the full width of the opening and sufficiently long to extend over the wall immediately below the window. The skirt is sealed to the wall along both the left and right sides of the skirt while the bottom edge remains unsealed. The skirt prevents wind-driven rain and air from penetrating the window-wall interface while allowing moisture to drain therethrough.

WO 2006/068924 A3

WO 2006/068924 A3



RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
10 August 2006

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

FLASHING METHOD USING AIR INFILTRATION BLOCKING SKIRT

5

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an air infiltration blocking skirt and a method for using the air infiltration blocking skirt.

10

2. Description of the Related Art

The drainage method currently used in the installation of windows, doors, and other fenestration products ("windows") used in building construction employs a sill pan that is open on the front (exterior side) and sealed in the rear (interior side) of the window. This allows moist air and wind-driven rain from the exterior of the building to penetrate the window-wall interface. The consequences of this are reduced thermal performance of the window, with the jambs of the window now exposed to the exterior air, as well as accelerated aging of the internal seal, which is the primary protective seal keeping air and water out of the interior of the building.

The window can be especially prone to air and water intrusion under the sill when subjected to high wind loads, such as the case with high rise buildings and geographical regions that experience severe wind and wind-driven rain exposure. Since sill pans are open to the front or outside of a building and sealed to the rear, there is no seal to prevent external air, which may be of substantially different temperature and moisture content than the air in the interior of the building, from penetrating the external plane of the window, particularly when the building exterior is subject to high wind loads and wind-driven rain. This exposure impacts the durability of the interior seal over time. Commercial-style and non-flanged windows, in particular, are more prone to air penetration under the bottom frame on the sill due to the inherent design

of these windows, since there is no protective flange blocking the wind. Wind driven rain between the window frame and the sill pan introduces moisture at the interior seal and jamb flashings and could impact thermal performance, seal durability, and proper drainage.

5

SUMMARY OF THE INVENTION

This invention is directed to a method for flashing a window during the installation of the window into a wall opening by using an air infiltration blocking skirt comprising a piece of weather resistant sheet material, the skirt having a top edge, a bottom edge and two side edges, and having a width at least equal to the width of the window and a length sufficient for the skirt to extend below the lowest portion of the wall opening, wherein:

- a) the top edge of the skirt is attached to the lower portion of the window continuously along the width thereof,
- b) the window is installed in the wall opening,
- c) the side edges of the skirt are sealed to the wall,

15

whereby the skirt covers the exterior surface of the wall below the window and the bottom edge of the skirt is not completely sealed to the wall such that a drainage path is maintained.

20

This invention is also directed to an air infiltration blocking skirt for use in the aforementioned method.

DEFINITIONS

The term "sill pan" refers to a shallow receptacle positioned on the sill portion of a rough wall opening in a building, which is open to the exterior of the building and sealed to the interior of the building, for the purpose of draining moisture.

25

The term "window" is used herein interchangeably with the term "fenestration product" to refer to any window or other fenestration product (e.g., door, vent, utility supply box, etc.) which is installed in wall openings in buildings.

30

The term "window sill" or "sill" refers to the bottom portion of the window frame. The window sill is typically horizontal.

The term "flashing" is used herein to refer interchangeably to any flashing product, e.g., self-adhering flashing product or other weather-resistant tape suitable for use in building construction.

The term "flanged windows" refers to windows, doors, or other fenestration products that include a flange or nailing fin intended to cover any space between the window frame and the rough opening in the wall. The flange or fin may be integral to the fenestration product, or may be applied.

The term "nonflanged windows" refers to windows that do not include a flange intended or nailing fin to cover the space between the window frame and the rough opening in the wall.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate the presently contemplated embodiments of the invention and, together with the description, serve to explain the principles of the invention.

Figure 1 is a front view (building exterior) of a window installation using an air infiltration blocking skirt according to the invention.

Figure 2 is a side view of an installation of a flanged window using the air infiltration blocking skirt according to the invention.

Figure 3 is a side view of an installation of a nonflanged window using the air infiltration blocking skirt according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

Reference will now be made in detail to the presently preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Throughout the drawings, like reference characters are used to designate like elements.

The present invention relates to a new flashing method using an air infiltration blocking skirt to prevent wind driven rain from entering a wall opening in a building between the opening or sill pan and the window (or other fenestration product) installed in the opening and to minimize air infiltration past the exterior plane of the window, while simultaneously allowing drainage of moisture to occur from within the wall opening to the exterior of the building beneath the air infiltration blocking skirt below the window..

The air infiltration blocking skirt as installed according to the invention is illustrated in Figure 1. The air infiltration blocking skirt is intended to be installed over, and in addition to, the weather-resistant materials that are typically applied to the exterior sheathing material, for example Tyvek® HomeWrap®, available from E. I. du Pont de Nemours and Company, Wilmington, Delaware (DuPont). The air infiltration blocking skirt (also referred to as the "skirt") 10 consists of a piece of weather resistant sheet material that is at least the full width of the opening in wall 17. Thus, the skirt width must be wider than the width of the window 12 and sufficiently long for the skirt to extend below the lowest portion of the wall opening so that it can be secured to the wall 17. Preferably, the skirt extends at least about four inches below the lowest portion of the wall opening. The skirt may be secured to the wall by flashing strips 15 along each side of the window, as shown in Fig. 1, or by other means of adhesion along the sides of the window. The air infiltration blocking skirt is not sealed along the bottom of the skirt, so that the skirt operates like a one-way check valve, in that the skirt allows a drainage path (as shown by the arrows in Fig. 1) to be maintained under the window through which water may flow out of the building, but the skirt does not allow wind-driven rain to enter the building. Note, to fully protect the wall itself from moisture, the sill portion of the wall opening is advantageously flashed with a sill flashing 13 per standard procedures known to builders and window installers.

Fig. 2 shows the side view of the window installation when the window 12 is a flanged window. A piece of flexible self-adhering tape 10a, for example, DuPont StraightFlash® flashing (available from DuPont) or some other suitable adhesive tape is placed on the top edge of the weather resistant sheet material 10b of the skirt, leaving at least about 1 inch of adhesive remaining exposed. The exposed adhesive is adhered to the exterior side of the flange at the sill of the window, or on the bottom of the window frame sill in the case of a non-flanged window as in Fig. 3. In either case, the adhesive continuously seals the skirt to the window along the entire width thereof. The window is then set in place and the side pieces of flashing are adhered along both sides of the window, sealing the window to the wall. The side pieces of flashing are advantageously adhered to the wall past the bottom of the skirt as shown in Fig. 1, thereby pinning the edges of the skirt down to the wall. The drainage path is maintained since the skirt is not sealed along the bottom edge of the skirt 10. The presence of the skirt covering the wall below the window blocks wind-driven rain and air flow from penetrating the external plane of the window.

The air infiltration blocking skirt can be made of any suitable weather resistant sheet material. A flashspun polyethylene sheet, such as Tyvek® HomeWrap® (available from DuPont) may be used.

A piece of tape having good adhesion is applied down the entire length of the left and right sides of the installed skirt to prevent the wind from damaging the skirt during the construction of the building. For example, self-adhering flashing such as DuPont StraightFlash® (available from DuPont) may be used.

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A method for flashing a window during the installation of the window into a wall opening using an air infiltration blocking skirt comprising a piece of weather resistant sheet material, the skirt having a top edge, a bottom edge and two side edges, and having a width at least equal to the width of the window and a length sufficient for the skirt to extend below the lowest portion of the wall opening, wherein:

a) the top edge of the skirt is attached to the lower portion of the window continuously along the width thereof,

b) the window is installed in the wall opening,

c) the side edges of the skirt are sealed to the wall,

whereby the skirt covers the exterior surface of the wall below the window and the bottom edge of the skirt is not completely sealed to the wall such that a drainage path is maintained.

2. The method of claim 1, wherein the length of the air infiltration blocking skirt is sufficient for the skirt to extend at least approximately 4 inches below the lowest portion of the wall opening.

3. The method of claim 1, wherein the window is a nonflanged window having a lower surface and the air infiltration blocking skirt is attached to the lower surface of the window.

4. The method of claim 1, wherein the window is a flanged window having a lower flange having an exterior-facing side and an interior-facing side, and the air infiltration blocking skirt is attached to exterior-facing side of the flange of the window.

5. An air infiltration blocking skin for use with a fenestration product in a wall opening in a structure, comprising a weather resistant substantially planar sheet material, having a top edge and a bottom edge, wherein the top edge of the skirt has an adhesive surface suitable for attaching the skirt to the bottom end of the fenestration product and the skirt is at least as wide as the wall opening and is of sufficient length to extend below the lowest portion of the wall opening only in the vertical direction.

6. The skirt of claim 5, wherein the length is sufficient to extend at least about 4 inches below the bottom of the wall opening.

7. The skirt of claim 5, wherein the weather-resistant sheet material is a flashspun polyethylene sheet.

1/2

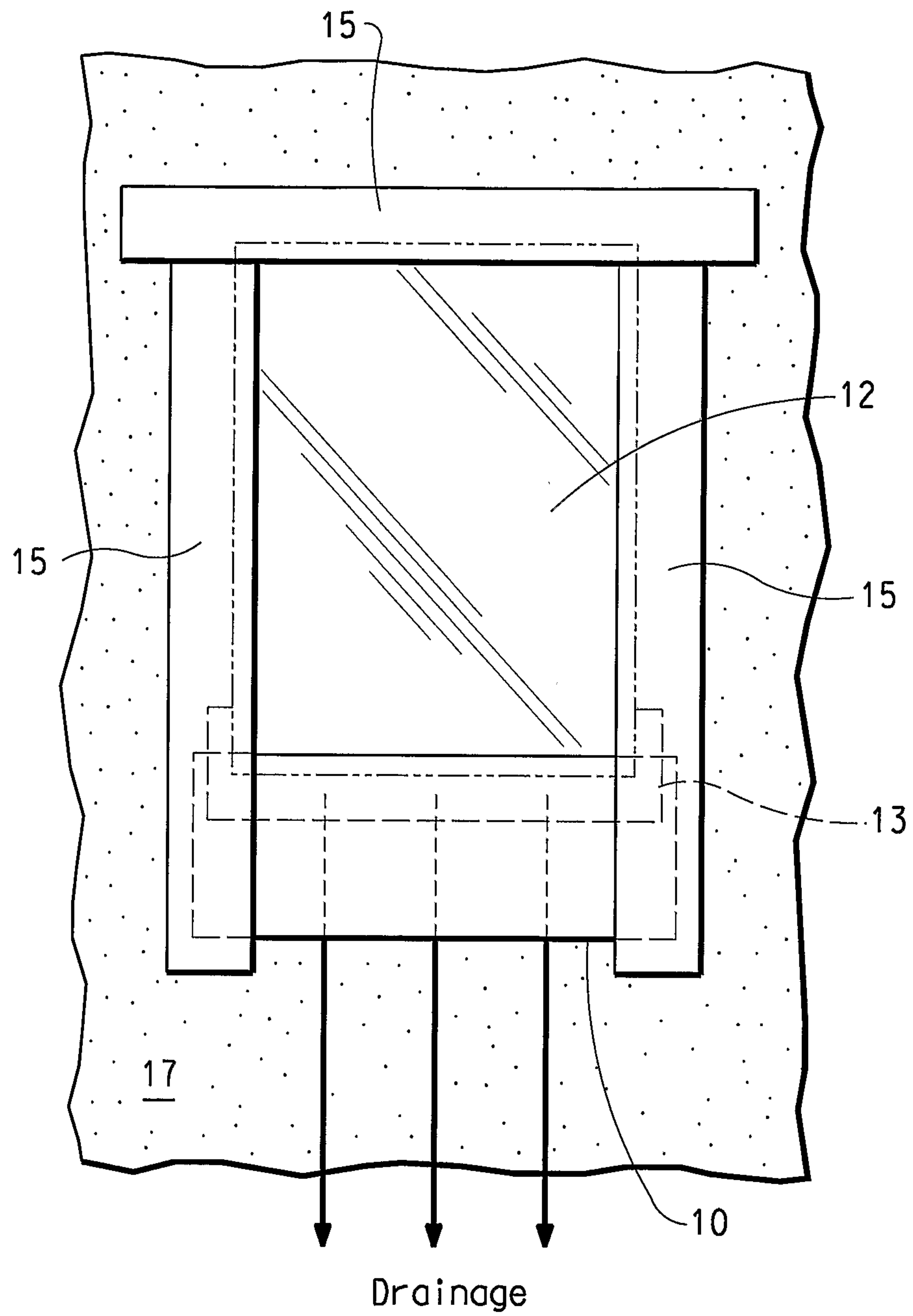


FIG. 1

2/2

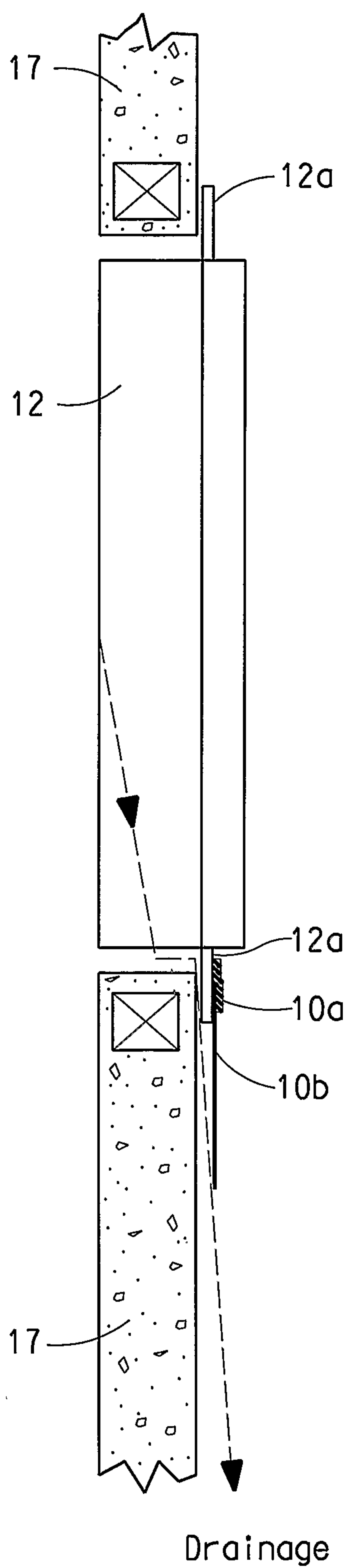


FIG. 2

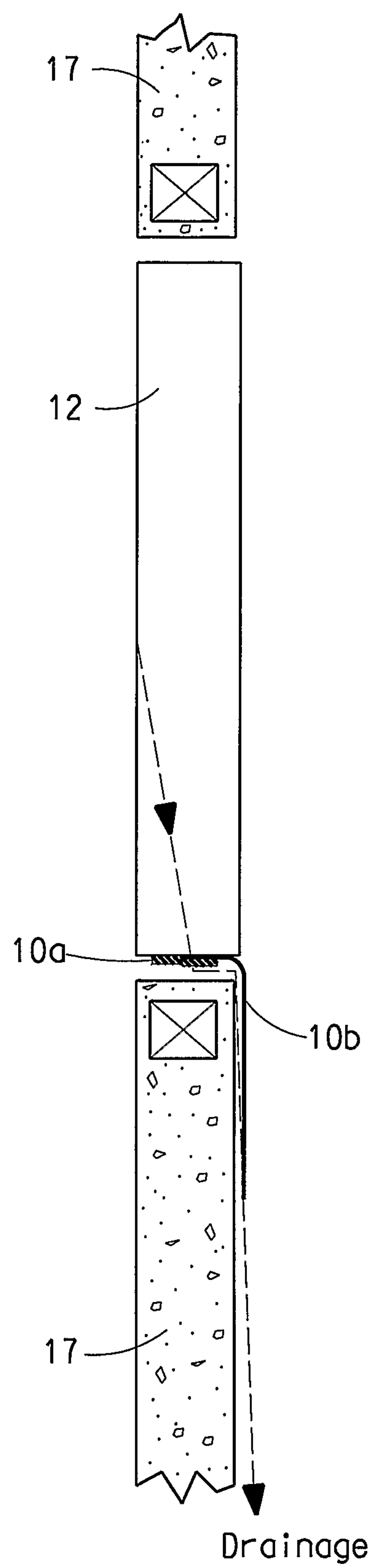


FIG. 3

