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WEEP HOLE CONSTRUCTION FOR WINDOWS AND THE LIKE

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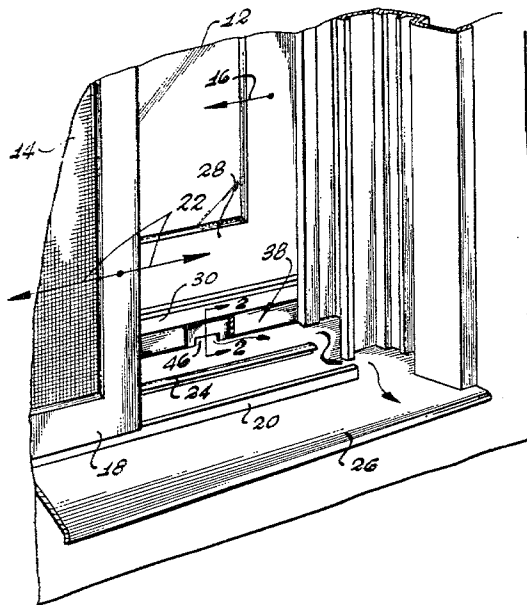


Fig. 1

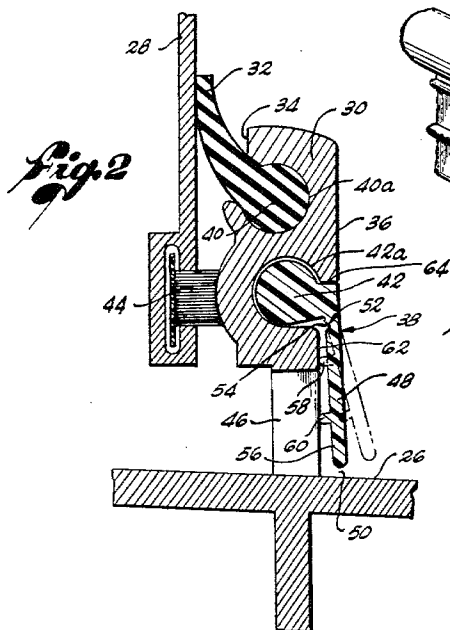


Fig. 2

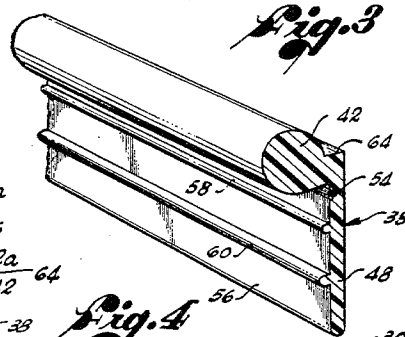


Fig. 3

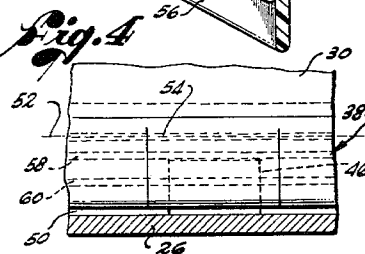


Fig. 4

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WEEP HOLE CONSTRUCTION FOR WINDOWS AND THE LIKE

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mesne assignments, to Ador Corporation, Fullerton, Calif., a corporation of California
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8 Claims. (Cl. 20—70)

This invention relates generally to window constructions and the like, and more particularly to a new and improved weep hole construction in the frames used for mounting laterally sliding vent panels or members. The present invention relates to improvements in weep hole construction of the type set forth in my copending application Serial No. 131,906, filed August 16, 1961, for Weep Hole Construction for Windows and the Like, now U.S. Patent No. 3,091,008.

In windows and doors using sliding or rolling vent panels, there is usually provided a metallic frame construction in which the head, sill and jambs are commonly made of extruded aluminum members. The head and sill members are formed with channels having vertical walls or flanges to accommodate and mount both the sliding or rolling sash and the fixed sash. Such constructions cannot avoid the collection of some water due to condensation and rain in the channels of the sill. In order to permit drainage of liquid collecting in the channels of the sill, the floor of the sill is sloped and properly positioned weep holes are normally provided in a staggered arrangement in the flanges or walls of the channels in the sill. Runoff of liquid trapped in the channels is thus possible, and the staggered arrangement of the weep holes prevents a direct inward flow of wind, sand, dust or water, and the like.

A staggered arrangement of weep holes is possible, of course, only where there are two channels having an inside and an outside flange, and a common flange between the two channels. A staggered arrangement of weep holes is possible because weep holes can be placed in the common flange as well as the outer flange. However, where only a single channel is used or available, weep holes can only be placed in the outer flange, and a staggered arrangement of weep holes is not available to prevent the direct inward flow of wind, sand, dust or water. In this instance, the weep holes are normally made much smaller which results in less effectiveness in rapid drainage or removal of condensation or rain.

The weep holes in the outer flange of a window sill are visible from the outside, and sometimes are unsightly in appearance, or do not blend in harmoniously with the rest of the window. Since it is desirable that the weep holes be made sufficiently large to permit rapid drainage, the weep holes are frequently partially concealed by means of an overhanging structure which can be, for example, a ledge having a vertical flange upon which a screen or storm sash slides. Such structure also shelters the weep holes and prevents the ready collection of clogging material before the drain holes. While this structure aids in concealing the weep holes and prevents material from falling down and accumulating before the weep holes, the weep holes are nonetheless visible at certain angles and, of course, are subject to a certain amount of inward flow of wind, sand, dust, water, etc.

Another method used for concealing weep holes is to provide a cover flap overlying the weep holes to prevent inward flow of water or dirt, etc., while being adapted to pivot away from the weep holes under the influence of water attempting to flow outwardly through the weep holes. Although such cover flaps have generally served their purpose, they have not proven entirely satisfactory in that such flaps exhibit a tendency, due to surface ten-

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sion, to stick to the flange embodying the weep holes and thereby resist deflection. In some instances, a substantial quantity of fluid must accumulate before the flap can be deflected to permit fluid escape.

Accordingly, it is an object of the present invention to provide a new and improved weep hole construction which overcomes the above and other disadvantages of the prior art.

Another object is to provide in the sill of a window frame an improved weep hole construction whereby large and properly positioned weep holes are relatively invisible and prevent inward flow of wind, sand, dust, water and the like.

A further object of this invention is to provide a new and improved weep hole construction for permitting rapid drainage of condensation and rain collected within channels of a window sill and yet prevent any inward flow of wind, sand, dust or water.

Still another object is the provision of a new and improved weep hole cover flap, which will not stick to the flange embodying the weep hole.

Yet another object is to provide an improved weep hole construction whereby the deflection resistance of the weep hole cover flap to deflection by water passing outwardly through the weep hole is reduced.

A still further object of the invention is to provide a simple weep hole construction in the sill of a window frame which results in an easily manufactured and more economical sill member.

The above and other objects and advantages of this invention will be better understood by reference to the following detailed description, when considered in connection with the accompanying drawings of illustrative embodiments thereof, and wherein:

FIGURE 1 is a fragmentary perspective view of the right corner of a window embodying a weep hole construction in accordance with the present invention, a portion of the weep hole cover flap being cut away to show the relative position of the weep hole and the drainage of water therefrom;

FIGURE 2 is an enlarged, fragmentary sectional view, taken along the line 2—2 in FIGURE 1, and illustrating the sill member and sliding or rolling vent panel;

FIGURE 3 is a fragmentary perspective view of a weep hole cover flap used in the weep hole construction of this invention; and

FIGURE 4 is a fragmentary, front elevational view showing the weep hole cover flap as it overlies a typical weep hole.

The weep hole construction, according to this invention, is obtained in a sill member having an outwardly downward sloping floor by providing first, in an upstanding flange thereof, suitably spaced openings which communicate with the floor of the sill member. A flexible cover flap is then affixed on one edge throughout the length of the upstanding flange such that the flap extends generally downward to cover the openings or weep holes. The lower edge of the cover flap preferably has a very small clearance of approximately .005 inch, for example, from the floor of the sill member to prevent sticking of the cover flap to the sill.

The cover flap is relatively thin, but has a height which, when the upper edge is affixed to the outside surface of the upstanding flange in the sill, establishes a pivot axis at such a distance or height above the floor of the sill member that any water accumulating within the channel can easily deflect the cover flap outwardly to permit draining of the accumulated water.

In accordance with the invention, the thickness of the weep hole cover flap at the selected pivot axis is modified to enhance its flexibility at that point and thus reduce the effort required to rotate the main body of the cover flap

about the pivot axis. The cover flap is also provided with a plurality of ribs to space the main body of the cover flap a very small distance away from the weep hole flange and thereby minimize the tendency for the cover flap to stick to the flange. These ribs also enhance the rigidity of the main body of the cover flap away from the pivot axis.

To further reduce the deflection resistance of the cover flap to fluids passing outwardly through each weep hole, the main body of the cover flap may be split or sliced at selected intervals along its length to reduce the deflection mass of the cover flap presented at each individual weep hole.

Referring now to the drawings, and particularly to FIGURE 1 thereof, there is shown a window construction embodying a laterally movable vent panel 12 and a screen 14. The window frame includes the usual head, sill and jambs which are preferably all extrusions of a tempered aluminum alloy and have suitably formed flanges and channels to accommodate the movable vent panel 12 and movable screen 14. The vent panel 12 is shown in a fully closed position and can be opened by movement to the left as indicated by the arrow 16. The lower rail member 18 of the sash of screen 14 mounts a pair of rollers (not shown) which ride on an upright flange 20 to permit free lateral movement of the screen 14, as indicated by the arrows 22. The movable vent panel 12 can be installed to open from right to left or left to right, as desired.

A fixed panel (not shown) is interchangeable with the vent 12 and can be either affixed in position on the left side of the window, or it can be affixed in position on the right side if it is desired that the vent panel 12 open from a left to right direction. The fixed panel is therefore similar in construction to the vent panel 12, and also includes suitable rollers in the lower rail member of its sash. These rollers are adapted to ride on a track 24 which is indicated in FIGURE 1. As can be seen in FIGURE 1, the track 24 extends almost to the right end of the sill member 26. The track 24 extends substantially from the right end of sill 26 to the left end thereof so that the fixed panel (not shown) can be positioned and affixed in place on either the right or left sides of the window.

The lower rail member 28 of the sash of vent panel 12 mounts a pair of rollers (not shown) which ride on a track within a channel having an outer flange 30. As can be seen more clearly in FIGURE 2, the outer flange 30 is provided with an elongated slot mounting means for a flexible weather seal 32 near the top of the inside surface 34 of the outer flange 30. The outside surface 36 of the outer flange 30 is provided with an elongated slot mounting means for a cover flap 38, as shown in FIGURES 2 and 3. Elongated slots or recessed openings, numbered 40a and 42a, thus run longitudinally down the length of the outer flange 30 in order to accommodate the enlarged beaded portions 40 and 42 of the weather seal 32 and cover flap 38, respectively. Suitable lengths of the weather seal 32 and cover flap 38 are then inserted endwise from one end of the outer flange 30 down the length thereof before the jamb members are attached to the sill 26.

Supplementing the weather seal 32 is a weather strip 44 which is mounted to the lower rail member 28. A number of weep holes 46 are provided along the lower edge of the outer flange 30. The cover flap 38 extends very nearly vertically downward over an undercut portion of the outer flange 30 such that the outside surface of the cover flap 38 adjacent the bead 42 thereof is normally substantially flush with the outside surface 36 of the outer flange 30. The enlarged beaded end 42 of the cover flap 30 is generally disposed at right angles to the very nearly vertical main body or flap portion 48, the lower end of which has a very slight clearance 50 with the surface of the sill 26.

Referring now to FIGURES 2-4, and particularly to

FIGURE 2, it will be apparent that the main body or flap portion 48 of the cover flap 38 is adapted to pivot about an axis 52 adjacent to and just below the beaded portion 42 of the cover flap. To enhance the flexibility of the cover flap 38 at the pivot axis 52, the flap is provided with an elongated groove or notch 54 to reduce the thickness of the flap at that point and thereby lower the bending resistance at the pivot axis. Hence, fluid attempting to move outwardly through any weep hole 46 can easily deflect the main body 48 of the cover flap 38 about the pivot axis 52 at the groove 54.

The rear surface 56 of the cover flap main body 48 is provided with elongated ridges or ribs 58, 60. These ridges are essentially parallel to each other and extend the full length of the cover flap 38. The ridges 58, 60 space the rear surface 56 of the cover flap main body away from the outer surface 62 of the lower portion of the flange 30 and thus minimize any surface tension effects which would tend to cause the cover flap to stick to the flange.

The ridge 58 closer to the pivot axis 52 is preferably made smaller, i.e., extends a shorter distance from the rear surface 56 of the flap, than the ridge 60 further away from the pivot axis. Such an arrangement serves to dispose the main body 48 of the cover flap 38 at a very slight acute angle off the vertical, so that the pivot axis 52 is closer to surface 62 of flange 30 and the upper edge 64 of the cover flap is essentially flush with the outer surface 36 of the flange 30. This minimizes the possibility of snagging the cover flap 38 in the event some object is passed along the flange surface 36 adjacent the cover flap.

The ridges 58 and 60 also serve to reinforce the main body 48 of the cover flap 38 and thereby enhance its rigidity. This not only enhances the relative flexibility of the cover flap at the pivot axis 52, but also reduces any tendency for the main body 48 to buckle during use.

As best observed in FIGURE 4, the main body 48 of the flap 38 may be split or sliced below the pivot axis 52 at selected intervals along the length of the flap. In this manner, water attempting to pass outwardly through a weep hole 46 need only deflect a small portion of the entire cover flap rather than be confronted with the entire mass of the cover flap 38 below the pivot axis 52.

From FIGURE 1 it can be seen that the weep holes 46 are preferably rectangular in shape and that the cover flap extends completely over the length of the outer flange 30 so that the cover flap normally rests flatly against the outer flange and essentially flush with the outside surface 36 thereof. Thus, the weep holes 46 normally remain well covered with minimum warping or bending of the cover flap to expose any part of a weep hole.

It is noted that relatively large weep holes 46 can be properly positioned along the outer flange 30 to permit easy and rapid drainage of water, yet these large weep holes are fully invisible and effectively sealed against the inward flow of wind, sand, dust and water. This weep hole construction also avoids the need of staggering the weep holes in an outside and an intermediate flange in order to prevent a direct inward flow of wind, sand, dust or water. A much more economical structure is also obtained since it is not necessary to make the screen flange or track in the form of an overhanging structure in order to shelter and conceal a series of weep holes.

The weep hole construction has been described mainly with respect to windows having a laterally movable vent panel only as an example of its utility, and such description is not intended to limit the scope of the invention in any way. The construction is, of course, useful in other structural forms wherein rapid and effective outward drainage of liquid is desired while preventing an inward flow of wind, sand, dust or water.

It will be apparent from the foregoing that, while particular forms of my invention have been illustrated and described, various modifications can be made without departing from the spirit and scope of my invention. Ac-

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cordingly, I do not intend that my invention be limited, except as by the appended claims.

I claim:

1. In a window frame including a sill having an upper surface and an upright flange disposed longitudinally on the upper surface of said sill, a weep hole construction comprising:

at least one aperture provided in said flange, said aperture meeting with the upper surface of said sill;

a longitudinal cover flap having an upper end affixed to said flange above said aperture and normally extending substantially downward over said aperture to cover the same, said cover flap having a portion of reduced thickness adjacent said upper end to provide a pivot axis;

and longitudinal rib means below and parallel to said pivot axis for spacing the portion of said cover flap below said pivot axis away from said flange, said rib means being integral with said cover flap.

2. An arrangement as set forth in claim 1, wherein the remaining portion of said cover flap below said portion of reduced thickness is sliced at longitudinal intervals to provide a plurality of deflectable flap sections, whereby the deflection resistance of said cover flap to liquid passing outwardly through any aperture is reduced.

3. In a window frame including a sill having an outwardly sloping upper surface and an upright flange disposed longitudinally on the upper surface of said sill and generally laterally to the sloping surface, a weep hole construction comprising:

at least one aperture provided in said flange, a lower edge thereof meeting with the upper surface of said sill;

a longitudinal, recessed channel provided in said flange above an upper edge of said aperture;

an undercut area provided below said channel in said flange;

a cover flap having an enlarged bead at one end inserted into said channel and secured thereto, said cover flap having a longitudinal groove therein adjacent said bead to reduce the thickness of said flap and provide a pivot axis for said flap at said groove; and a plurality of longitudinal ribs parallel to said pivot axis for spacing the portion of said cover flap below said pivot axis away from said flange.

4. An arrangement as set forth in claim 3, wherein said ribs are of different size to position said one end of said cover flap substantially flush in said undercut area.

5. An arrangement as set forth in claim 3, wherein

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said cover flap is sliced at longitudinal intervals, said slices being essentially perpendicular to said longitudinal groove.

6. A cover flap for a weep hole construction, comprising:

an elongated flap member having upper and lower ends and front and rear surfaces, said flap member having a longitudinal groove in the rear surface thereof adjacent said upper end and providing a region of maximum flexibility at said groove;

and a pair of longitudinal ribs parallel to said groove projecting from the rear surface of said flap member, the rib further from said groove extending further from said rear surface than the rib nearer said groove.

7. A cover flap for a weep hole construction, comprising:

an elongated, substantially planar, flap member having upper and lower ends and front and rear surfaces, said flap member having a longitudinal groove in the rear surface thereof adjacent said upper end; an enlarged mounting bead extending from said upper end;

and a pair of longitudinal ribs parallel to said groove projecting from said rear surface of said flap member, the further rib extending further from said rear surface than the rib nearer said groove.

8. A cover flap as set forth in claim 7, wherein said flap member is sliced at longitudinal intervals, said slices being essentially perpendicular to said longitudinal groove.

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