

A DRAINAGE SYSTEM FOR A WINDOW ASSEMBLY

This invention relates to a drainage system for a window assembly and is particularly concerned with draining water from windows.

5 The invention is primarily concerned with the drainage of rain water from louvre windows and will therefore be described in this context but is by no means limited to this particular use and the broader usage should be borne in mind.

10 In countries which receive heavy rainfalls on a frequent basis, due to tropical storms or cyclones, it is known to fit non-moving metal louvres to window frames. This is for protection of the pivoting glass louvres positioned behind the fixed louvres. The metal louvres also provide a degree of security. During a storm, water cascades over the fixed louvres and this is not very desirable. Therefore it is desirable to have a drainage
15 system that will carry away rain water from the fixed louvre.

It is known to provide fixed horizontal louvres with a drainage channel in the form of a V-shaped recess located on the end of the louvre. The water runs down the louvre and into the recess. The rain water is then carried to an open vertical section located on the side of the window frame and forming part of the window jamb. The water then flows down the open
20 section.

During heavy storms, it is found that the recess overflows as it cannot drain away quickly enough. Increasing the size of the recess is not a solution as it looks unsightly. Increasing the size of the jamb section is also
25 not a solution as it appears that the bottleneck is water passing along the recess.

We have now developed a system whereby water drainage from a, or a set of louvres can be improved. We can achieve this by providing a pressure differential which can gently suck water from the louvre,
30 thereby improving the drainage flow rate of the louvre.

It is an object of the invention to provide a system which may overcome the abovementioned disadvantages or provide the consumer with

a useful or commercial choice.

In one form the invention resides a drainage system for a window assembly comprising a window surround frame having opposed vertical jamb members, at least one louvre extending between the jamb members, the louvre being inclined and having a lower portion formed with a gutter for draining water, an end of the gutter communicating with an opening in a substantially closed chamber in one of the side jamb members, the chamber having a lower outlet to allow water to drain from the chamber.

Although not to be bound by theory it is believed that the abovementioned drainage system operates effectively because it creates a positive water flow. The positive water flow is achieved in a similar manner to a water piston. Because the chamber is substantially closed, the flow of water through the closed chamber creates a pressure differential. This in turn creates a partial vacuum above the water level in the chamber, causing water in the gutter to be sucked into the closed chamber creating a better or positive flow of the water. Thus, the inherent difficulties of the known drainage systems can be avoided.

The louvre may comprise an elongate substantially planar main body having longitudinal side edges and transverse end edges. One longitudinal side edge may include the gutter. The louvre may be profiled to increase its strength, and due to its profile, a better water flow may occur.

A suitable material that the louvre may be constructed from may be durable to various weather conditions. Such a material may be aluminium. The louvre may be formed by extrusion. The louvre may have recess or holes to allow for the attachment of fasteners to hold it in the fixed position. An upper portion of the louvre member may have an upwardly extending wall.

The gutter may collect the water running from the louvre, and is typically integrally formed with the louvre. A plurality of gutters may be provided and the gutters may be arranged such that when a first gutter becomes full, water may overflow into a second gutter. The gutter or gutters may be curved or V-shaped. Typically the first gutter is V-shaped whilst the second is curved. The first gutter may carry a

comparatively small amount of water compared with the second gutter. The curvature of the second gutter may assist in flow of water by forming an area of low pressure within the gutter as wind passes over the gutter and up the louvre.

5 The substantially closed chamber may comprise tubular sections and these may be formed from metal extruded from an appropriate die. There may be two substantially closed chambers which may be located on either end edge of the louvre. This can increase the amount of water that can be drained. Each chamber may be divided into a number of
10 separate sections. There are typically two sections. The sections may be of any shape but preferably is a shape that allows water to run freely.

 The opening in the chamber may be of any geometrical shape. Typically the inlet port is circular. It can be smaller than the cross-sectional size of the gutter. There may be as many openings as there are louvres.

15 The outlet may allow water to pass out of the closed chamber. The outlet may be any geometric shape desired but typically is rectangular. Usually, the outlet is located adjacent to the base of the closed chamber. There may be the same number of outlets as closed chamber sections. Typically, there are two outlets.

20 An embodiment of the invention will be described with reference to the following figures.

 Figure 1 is a rear perspective view of a drainage system.

 Figure 2 is a front perspective view of the system according to Figure 1.

25 Figure 3 is a side view of a drainage system according to an embodiment of the invention.

 Referring to the figures there is shown a window assembly 10. The window assembly has a window surround frame being formed from a pair of opposed vertical jamb members 11,12 (only one shown), a top
30 horizontal connecting member (not shown), and a bottom horizontal sill 13. These members are connected to each other by known means. Within the surround frame is provided a known pivoting louvre assembly 14 formed

from glass louvre blades 15–18, the ends of which are held by pivoting end caps. A handle 19 can be manipulated to pivot the glass blades between open and closed positions as is known.

In front of the pivoting louvre assembly 14 is provided a plurality of spaced parallel, vertically extending fixed louvres 20 – 23. The fixed louvres extend between the opposed side jambs. The fixed louvres are connected to the side jambs by any means, for instance by screws, rivets or other type of connectors which can pass within recesses 24, 25 formed on the underside of each louvre. The louvres are formed from metal and can be profiled to provide rigidity. Each louvre is downwardly inclined and has an upper rear longitudinal edge 26, a lower front longitudinal edge and a pair of opposed end edges, the end edges being secured to the respective jamb. At least some of the louvres are provided with an upwardly extending lip 28 extending from the upper longitudinal edge the function of which is to prevent rainwater from passing over the upper longitudinal edge (which can occur during storms with high wind).

The lower longitudinal edge of at least some of the louvres are formed with a gutter 30. In the embodiment, a pair of gutters are provided being an upper smaller gutter 31 and a lower larger gutter 32. The two gutters are separated by an intermediate upstanding lip 33. The profile of the upper gutter is substantially V-shaped while the profile of the lower gutter is substantially curved. The lower gutter has a front face 34 which curves upwardly and inwardly. The function of the curved front face is to provide a low pressure area within the lower gutter when wind passes across the louvre. Each gutter extends along the entire lower longitudinal edge of the louvre and towards the respective side jamb. The side jamb is provided with openings 35 – 42 to allow both the upper gutter and the lower gutter to drain. The openings in the side jamb communicate with internal closed chambers 43, 44 (see figure 1) which form part of the jamb. The chambers are separate from each other such that water draining from the upper gutter and water draining from the lower gutter do not mix. Each chamber is substantially closed by which is meant that it is sealed apart from

the openings communicating with the gutter.

- 5 The bottom of each chamber includes outlets 45, 46 adjacent the sill to allow water passing into each chamber to flow onto the sill and away from the window assembly. In use, rain strikes the upper part of each
- 10 louvre and drains initially into the upper gutter which then drains through the respective opening in the jamb and out through the bottom outlet. Overflow water passes into the lower larger gutter which also drains through its chamber. By having the chamber substantially sealed, a slight vacuum is created in the chamber as water flows down it and out through the outlets.
- 15 This in turn encourages water to pass into the chamber from the gutters through a slight but effective sucking action. The slight pressure differential provides a higher efficiency in drainage of water from the gutters and therefore it is not necessary to provide much larger gutters (which may be unsightly).
- 15 It should be appreciated that various other changes and modifications may be made to the embodiment described without departing from the spirit and scope of the invention.

**CLAIMS:**

1. A drainage system for a window assembly comprising a window surround frame having opposed vertical jamb members, at least one louvre extending between the jamb members, the louvre being inclined and having a lower portion formed with a gutter for draining water, an end of the gutter communicating with an opening in a substantially closed chamber in one of the side jamb members, the chamber having a lower outlet to allow water to drain from the chamber.
2. The system of claim 1, wherein each of the jamb members is provided with the substantially closed chamber.
3. The system of claim or claim 2, wherein the louvre is fixed, has longitudinal side edges and transverse end edges and where one longitudinal side edge includes the gutter.
4. The system of any one of the preceding claims, wherein the other longitudinal edge has an upwardly extending lip to resist passage of water over the said other longitudinal edge.
5. The system of any one of the preceding claims, wherein the gutter is formed by shaping the lower portion of the louvre.
6. The system of claim 5, wherein the lower portion is turned upwardly and inwardly to define the gutter.
7. The system of any one of the preceding claims, wherein the gutter comprises a first and second gutter.
8. The system of claim 7, wherein each said gutter communicates with its own separate said opening.
9. The system of claim 8, wherein each said opening communicates with its own substantially closed chamber which has its own lower outlet or outlets.
10. The system of any one of claims 7 - 9, wherein the first and second gutters are separated by a common wall.
11. The system of any one of the preceding claims, wherein the chamber comprises a tubular section within, or forming part of the jamb.
12. The system of any one of the preceding claims, wherein the gutter and the opening are sealingly associated together to minimise leakage



of water between the gutter and opening.

13. The system of any one of the preceding claims comprising a plurality of vertically spaced said louvres within the surround frame.

14. The system of any one of the preceding claims including
5 pivoting glass louvres positioned behind the said louvres.

15. A system as claimed in any one of the preceding claims substantially as hereinbefore described with reference to the accompanying drawings.