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(54) LOUVRES HAVING ADJUSTABLE ANGLE BLADES

(71) We, HARTNETT HOLDINGS PTY. LTD., of 145 Gladstone Street, South Melbourne, Victoria, Australia, a Company incorporated under the laws of the said State of Victoria, Australia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in louvres for use in buildings and in particular to adjustable angle louvres to provide light and air ventilation for large buildings such as factories, offices, homes and warehouses. It may be used on large screens disposed adjacent to swimming pools or patios and in other positions where sun glare can also be suppressed by the use of coloured, translucent louvre blades.

As a cheap form of ventilation various forms of louvres have been used in the past. Where transmission of light is important it has been usual to use a 30 ounce reed pattern drawn glass louvre blade which is limited to a maximum length of about 32 inches and a width not exceeding 7 inches because of its lack of strength and robustness. It is desirable to provide louvre ventilation using much larger louvre blades to eliminate the necessity of using numerous intermediate supports for the blades. This is especially so in factories.

Another aspect of prior art constructions is the lack of security provided. The louvre blades generally fit into channel shaped holders disposed to fit on each end of the louvre blade. The blades are easily removable from these holders as a tight and secure fit cannot be provided because allowances must be made for expansion. Thus, it is desirable to provide ventilation louvres with which security of the building is not affected.

The prime object of a louvre ventilation system is to provide a flow of fresh air through a building, such as a factory, and to assist in cooling the factory building. Research by C.S.I.R.O. has shown that at an air velocity of 1.5 metres/second at a temperature of 30.5°C a person clothed in long

trousers, shirt and tie is just as comfortable as he would be at 21°C with no air movement. Beyond an air speed of 1.5 metres/second little improvement was achieved. Similar results were achieved with partially clothed subjects where the comfortable working temperature was, of course, a little higher than for a fully clothed subject. Thus, a low air velocity such as that provided by louvre ventilation systems is quite adequate. An important finding in this C.S.I.R.O. research was that cooling air which is to flow around the body of a worker (either seated or standing) must enter the building close to floor level such as one to two feet above the floor. To provide the conventional type glass louvres at such a low level results in a high breakage rate. It is, therefore, desirable to provide ventilation louvres that can safely be used at low wall heights.

Some louvres have been provided in aluminium or wood, but these only prevent breakage which occurs with the more common glass louvres. No previous louvre assembly has adequately provided satisfactory ventilation, natural lighting and adequate security as well as being simple to install.

Common louvre constructions are of small dimensions using glass or other material mounted in adjustable metal side frames or holders. It has proved impractical to adapt these constructions for use on a large scale in the outer walls of factories, warehouses and the like. There is a definite limitation on the size of the louvre sheets which can be used, not to mention the inconvenience of fitting each small louvre sheet into side frames. The upright carrying these side frames must also be fitted to the vertical supports in the wall of the building.

Thus, it is an object of the present invention to enable at least some of the previously mentioned disadvantages to be overcome or at least mitigated.

According to one aspect of the present invention there is provided a ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the

form of a bar extending longitudinally across a central portion of the sheet and/or in the form of a frame having lateral members, means for providing the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

According to a second aspect of the present invention there is provided a ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a bar extending longitudinally across a central portion of the sheet, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

According to a third aspect of the present invention there is provided a ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a frame comprising lateral members and longitudinal members, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

According to a fourth aspect of the present invention there is provided a ventilation louvre unit, which comprises two substantially parallel frame members, a plurality of ventilation louvres, each as claimed in any one of the three preceding paragraphs, which louvres extend between and substantially at right angles to the two frame members, pivot pins of each louvre seating in complementary bushes, which bushes are disposed in the frame members, plates extending between the frame members at opposite sides of the plurality of louvres and a mechanism connected to all the pivot pins seated in one of the frame members for controlling the degree of rotation of each louvre.

One embodiment of the present invention employs a simpler means of mounting louvres of a larger size to form louvre units in walls such as walls of factories and warehouses.

In a further embodiment of the present invention when the bar is the sheet supporting means a sealing strip is secured to the lateral sides of the sheet. In an alternative embodiment of the present invention when the frame is the sheet supporting means a strip is secured to the lateral members of the frame. Alternatively when the bar and the frame constitute the sheet supporting means the sealing strip can be secured to the lateral sides of the sheet or to the lateral members of the frame whichever is convenient or appropriate.

The present invention is partly based on

the desirability of using a type of plastics building sheet which has for example high strength and is resistant to deterioration by ultraviolet radiation. However, until the present invention, no suitable means had been found for making use of this material in louvre units for outer walls of factories, warehouses and the like.

The present invention enables the use of corrugated high impact non-inflammable synthetic plastics sheet material in a ventilation louvre for use in buildings such as warehouses, factories, and the like. This material is available in a range of colours and is translucent which makes it possible to provide natural light without any associated sun glare. Also, the present invention can overcome the dimensional limitations normally associated with conventional louvre constructions due to the use of a bar and/or frame which provide longitudinal rigidity to each louvre and which can provide a pivot axis for each louvre. Furthermore, the louvres can provide an excellent security as they can be adapted such that they can only be removed by use of a specifically designed tool which is a distinct advantage over prior art louvres which were easily removed.

Preferably, the bases of the corrugations are rectilinear so that the surface to which the bar and/or frame can be bonded is flat. The corrugations may be square or rectangular in cross-section for example. Corrugated sheets of this type can provide rigid louvres having good strength characteristics under exposure to sun, wind and rain. The corrugations also assist in accommodating expansion of the plastics material due to heat and allow for sheets of up to 8 feet in length to be used.

The preferred material for the louvres is that sold as Vinacryl high impact building sheet, which is highly resistant to acid or alkali attack and to weathering as well as to fungi and insects. This material is light in weight and has, as a coating, on the surface to be exposed to the sun, a thin acrylic coating which reduces ultraviolet transmission by 90% or more and also reduces infrared transmission by a factor of about 40%. However, transmission of visible light is not greatly affected, but is dependent on the colour selected for the material. Unpigmented material transmits about 88% of visible light, while the coloured material transmits about 82%. This material requires no maintenance and is also fire resistant, in accordance with Australian Standard A 30.1958 Section 3. Louvres in this material have been made in lengths of 45½" and 91" and in widths of 15", 16" and 18" and each of these have performed satisfactorily.

By careful selection of the material to be

used in the louvres a high degree of light control can be attained. For example on a westerly facing building the green colour is most satisfactory, transmitting 82% of the natural light, yet almost eliminating sun glare. Similarly, the pale yellow colour is satisfactory for an easterly facing building which transmits 82% or more of the natural light and yet reduces morning glare to a minimum. Where sun glare does not exist, neutral, almost clear or unpigmented material can be used.

The opaque colours are very satisfactory for change or wash rooms, toilets, and the like, where privacy is required and in these applications the opening angle of the louvres is restricted by a special stop in the control mechanism so that they are not elevated more than 30° or less, with respect to the wall or other exterior surrounds and thus privacy is provided while good ventilation is accomplished.

The frame may be fixed about the periphery of the sheet, may be composed of plastics material, aluminium or steel and acts to reinforce the sheet longitudinally. The frame may be in tubular or angle form and suitably secured to the sheet. The lateral members of the frame can incorporate pivot pins or tubes. The frame can be disposed well within the periphery of the plastics sheet and it is not necessary to have the frame at the outer perimeter of the sheet.

The sealing strip on each of the lateral members of the frame may be selected from neoprene, or other suitable material, to provide an effective weather proof seal when the louvres are closed. Each sealing strip can not only project laterally from the end of the louvre but can also be longer than the width of the blade to overlap with the strips on adjacent louvres. The strips can be secured by screws and the lateral projection of the strip can be adjusted.

A bar, which may take the form of a tube, may be used either instead or with the frame and can extend longitudinally across the centre of the corrugated sheet. This tube or bar may be a galvanized zinc coated sheet steel, or cadmium plated or vinyl coated steel tube of rectangular cross-section, preferably 2" by 1", but extruded aluminium tubes and channels have also been used. These may be fixed to the sheet by rivetting for example aluminium alloy, stainless steel or monel pop rivets. (The word "Model" is a Trade Mark). An alternative means of fixing is to press a series of prongs out of the metal tube, insert these through the plastics sheet and bend them over to secure the tube to the sheet. This tube should be parallel to one longitudinal edge of the rectangular sheet. The pivot pins or tubes in this modification fit into the ends of the bar or tube.

With a bar of this sort, it is preferred to use as a pivot pin or tube a 1½" diameter cylindrical tube which is reformed for approximately 6" at one end into a rectangular shape which is inserted into the bar or tube. The cylindrical extension from the bar is adapted to fit into carrying brackets mounted on the vertical supports of the buildings in which the louvres are to be used. Alternatively, the bar can be a rigid PVC L-Section having either one face bonded to the sheet or the two edge portions bonded to the sheet to form a triangular tube. To this L Section, steel tubes can be secured by U shaped bolts or, alternatively, plastics rods can be hot air welded to the L Section to form the pivot pins. Another form of bar which is also preferred is triangular, the pivot tube or pin and a retaining plate therefore being slidable within the triangular bar. The pivot tube or pin can be located in position by screws.

When the bar or frame is a metal coated with a plastics material, the surfaces to be bonded, that is the bar and/or frame and sheet are cleaned and then bonded by a solvent adhesive. Another means of bonding the two synthetic plastics surfaces is by hot air welding to provide a strong adhesive bond between the bar or tube or frame and the corrugated sheet.

A single bar can be used for cheaper louvre constructions where the bar can even be composed of wood. Sheets mounted on single bars are usually 8—14" in width. The width is governed by the strength of the corrugated sheet. In high winds, the sheet may tend to twist about the single bar and result in breakage of the sheet. Also, the absence of a strengthening frame means that wide sheets on a single bar can be more easily bent and provide access to intruders. However, if the width of louvres having a single bar is restricted to below 14" such problems are minimized.

Pivot tubes for the frames or bars can be designed so that their removal is difficult which ensures that the louvre blades are also difficult to remove and ensures the security of the building. The pivot pins or tubes can be internally threaded at one end. They are driven or pressed into holes in the frame so that they fit tightly and can only be removed by tools carrying an external thread which engages the internal thread of the tubes. The other end of each pivot tube can be accommodated in a plastics bush in the surrounding wall member so that the louvre blade rotates with the associated pivot tubes which rotate within the plastics bushes.

To ensure security, metal rods which are externally threaded can be inserted into each pivot tube and these rods can then be joined to form a link across the middle of the louvre

blade making it even more difficult to remove each blade. Alternatively, metal bars can be welded to the vertical supports so that these bars extend between the supports parallel to the pivot tubes and just laterally behind them so that rotation of the blades is not hindered. Bars of this kind would be the same distance apart as the width of the louvre blades.

When a number of the louvres of this invention are mounted in a wall to form a series of parallel vertically spaced louvres, they are conveniently operated by a single mechanism or pivot control. This, preferably, comprises a vertical control rod or bar which in one embodiment is pivotally connected to the bar or tube of each louvre in the series of vertically spaced louvres. Conveniently, a flat metal bar of 4—6" in length is welded at one end into a slot in the bar or tube of each louvre and in the other end extremity of this bar a pivot pin is inserted to couple this bar to the vertical control rod or bar.

This arrangement provides a convenient means for adjusting the angle of the series of louvres from the vertical (fully closed) to the horizontal (fully open), or any position between, in a single operation. The vertical control rod or bar may be locked at any desired position to maintain the louvres at a fixed angle. Other suitable means can also be used to control a bank of louvres. Gears or sprockets on each pivot tube can be controlled by a chain from a central control. Belts, wires or cords can be used in a similar way. Such devices have been used in conventional louvre assemblies and can conveniently be located in the vertical surrounding panels or walls which support the louvre unit.

The louvres may be mounted with their pivot axes vertical rather than horizontal. The single control rod or bar mentioned above can easily be positioned in the horizontal position for control of the angle of the louvres. The controls for these vertically mounted louvres can be similar to those for horizontally mounted louvres but are conveniently located in the horizontal panels or walls supporting the louvre unit.

A further feature of the present invention is that the single bank of louvres discussed above can easily be duplicated or triplicated to form a multiple bank in a preformed structural unit. In a three-bank unit, the two end vertical frame members or beams are of H cross-section or another suitable load bearing form. The two inner vertical frame members or supports are of lighter load bearing capacity and may be 4"×4" tubular steel or 3"×2" or 2"×2" or a H section.

The pivot pins can extend wholly through the two inner verticals to provide common

pivots for the louvres disposed on either side. By using high strength outer verticals the need for costly inner vertical supports or horizontal beams is reduced. This construction results from the use of pivot tubes which can extend through the inner verticals and eliminate the need for duplication of frame members in the construction as separate surround frames are not needed for each bank of louvres.

The control for adjusting the inclination of the louvre blades can incorporate a temperature sensitive compound which acts on the louvre control so that the ventilation provided by the louvres is automatically adjusted as temperature conditions change. Similarly incorporation of a pressure sensitive device which can be attached to the louvre control can ensure automatic closing of the louvres in high winds or storm conditions.

For a better understanding of the present invention and to show how the same may be put into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 shows an isometric view of a unitary construction embodying the louvres of this invention,

Figure 2 shows a sectional view from above of the end of a single louvre illustrating the pivot control, and

Figure 3 shows a sectional view taken along the line 3—3 of Figure 1.

Referring to the drawing, each louvre consists of a rectangular frame 4 supporting a corrugated Vinacryl sheet 5. The frame 4 is composed of $\frac{1}{2}$ " by 1" steel tube along the length and $\frac{1}{4}$ " square steel tubes 9 at each end of the sheet the latter tubular steel frame carrying pivot pins 6 which support the louvre frame 4 in a frame 7 of a wall or window. Each pivot pin 6 fits into a sleeve 8 in the frame 7 and extends through the associated side member 9 of the louvre frame 4. Each pivot pin 6 has fixed to it a retaining plate 10 which is screwed to the frame 4. The pivot pin 6 is able to be withdrawn from the sleeve 8 when the louvres are to be removed from frame 7. The sleeve 8 is of non-moisture absorbing plastics material and fits into holes in the surrounding frame.

A neoprene sealing strip 12 can be adjusted so that it extends sufficiently beyond the frame 4 to seal with the inner face of frame 7 and is secured by a number of screws 11. A metal strip 13 provides means for tightening each screw 11 to secure effectively the sealing strip 12. The neoprene strip 12 extends the length of each side member 9 and is preferably $\frac{1}{16}$ " thick and $\frac{3}{4}$ " wide. The metal strip 13 may extend up to $\frac{1}{4}$ " beyond the frame 4 and acts to retain the end of the Vinacryl sheet 5.

When fitting the louvre, the extension of the sealing strip can be adjusted by loosening the screws which hold the metal strip securing the sealing strip to the frame and then extending the edge of the strip until it effects a seal with the internal surface of the corresponding upright of frame 7.

The pivot pins 6 are a very tight fit in the frame 4 and are so designed to make their removal difficult. The pivot pins are of $\frac{3}{8}$ " external diameter and $\frac{1}{16}$ " internal diameter and have an internal screw thread at that end of the pin which extends through the frame 4. By using a complementary externally threaded tool the pivot pins can be removed. This feature of the invention is an important one for security as it virtually safeguards illicit removal of the louvres.

Plates 15 are provided at the top and bottom of the frame 7 to provide a seal for the louvres in the closed position. These plates are preferably about 1" wide. Sponge rubber, or other suitable material, can be bonded to the plates 15 in order to fill the spaces between the corrugated sheets 5 and the plates 15.

The assembled louvres are opened or shut by rotation of the pivot pins 6 in the sleeves 8. Arms 16 are secured to each louvre frame 4 around pin 6 and are pivotally connected to a vertical rod or bar 17. A control lever 18 is connected via a connecting rod 19 to the vertical rod or bar 17. The control lever 18 pivots about a pivot rod 20 which is secured to one of the plates 15 by a U shaped plate 21. A plate 22 has a series of holes 23 adapted to co-operate with a peg 24 secured to lever 18. By pulling lever 18 sideways against the tension of a spring 25, peg 24 is released from one of the holes 23 of the plate 22 and the lever 18 can then be moved to another position resulting in an alteration to the angle of inclination of the louvres.

The louvres of this invention are adapted to an assembly line method of manufacture and can conveniently be produced as banks of louvres in surround frames which can be fitted into wall frames of a building. This construction is very suitable where modularized construction techniques are used.

WHAT WE CLAIM IS:—

1. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a bar extending longitudinally across a central portion of the sheet and/or in the form of a frame having lateral members, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

2. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a bar extending longitudinally across a central portion of the sheet, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

3. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a frame comprising lateral members and longitudinal members, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

4. A louvre according to Claim 1 or 2, wherein the sheet supporting means comprises the bar and a sealing strip is secured to the lateral sides of the sheet.

5. A louvre according to Claim 1 or 3 wherein the sheet supporting means comprises the frame and a sealing strip is secured to the lateral members of the frame.

6. A louvre according to any one of the preceding claims, wherein the means for pivoting comprises pivot pins located in the ends of the bar or in the lateral members of the frame.

7. A louvre according to Claim 1, 3 or 5 or to Claim 6 when appended to Claim 1, 3 or 5, wherein the frame is fixed about the periphery of the sheet.

8. A ventilation louvre according to Claim 6 or to Claim 7 when appended to Claim 6, wherein each pivot pin is removable and is internally screw threaded for cooperation with an externally threaded withdrawing tool.

9. A ventilation louvre unit, which comprises two substantially parallel frame members, a plurality of ventilation louvres, each as claimed in any one of the preceding claims, which louvres extend between and substantially at right angles to the two frame members, pivot pins of each louvre seating in complimentary bushes, which bushes are disposed in the frame members, plates extending between the frame members at opposite sides of the plurality of louvres and a mechanism connected to all the pivot pins seated in one of the frame members for controlling the degree of rotation of each louvre.

10. A ventilation louvre unit according to Claim 9, wherein the louvres extend, in use of the unit, horizontally between the frame members, which frame members are upright.



When fitting the louvre, the extension of the sealing strip can be adjusted by loosening the screws which hold the metal strip securing the sealing strip to the frame and then extending the edge of the strip until it effects a seal with the internal surface of the corresponding upright of frame 7.

The pivot pins 6 are a very tight fit in the frame 4 and are so designed to make their removal difficult. The pivot pins are of $\frac{3}{8}$ " external diameter and $\frac{7}{16}$ " internal diameter and have an internal screw thread at that end of the pin which extends through the frame 4. By using a complementary externally threaded tool the pivot pins can be removed. This feature of the invention is an important one for security as it virtually safeguards illicit removal of the louvres.

Plates 15 are provided at the top and bottom of the frame 7 to provide a seal for the louvres in the closed position. These plates are preferably about 1" wide. Sponge rubber, or other suitable material, can be bonded to the plates 15 in order to fill the spaces between the corrugated sheets 5 and the plates 15.

The assembled louvres are opened or shut by rotation of the pivot pins 6 in the sleeves 8. Arms 16 are secured to each louvre frame 4 around pin 6 and are pivotally connected to a vertical rod or bar 17. A control lever 18 is connected via a connecting rod 19 to the vertical rod or bar 17. The control lever 18 pivots about a pivot rod 20 which is secured to one of the plates 15 by a U shaped plate 21. A plate 22 has a series of holes 23 adapted to co-operate with a peg 24 secured to lever 18. By pulling lever 18 sideways against the tension of a spring 25, peg 24 is released from one of the holes 23 of the plate 22 and the lever 18 can then be moved to another position resulting in an alteration to the angle of inclination of the louvres.

The louvres of this invention are adapted to an assembly line method of manufacture and can conveniently be produced as banks of louvres in surround frames which can be fitted into wall frames of a building. This construction is very suitable where modular construction techniques are used.

WHAT WE CLAIM IS:—

1. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a bar extending longitudinally across a central portion of the sheet and/or in the form of a frame having lateral members, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

2. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a bar extending longitudinally across a central portion of the sheet, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

3. A ventilation louvre comprising a sheet of corrugated plastics material having longitudinal and lateral sides, the corrugations extending substantially perpendicularly to a longitudinal axis of the sheet, sheet supporting means in the form of a frame comprising lateral members and longitudinal members, means for pivoting the sheet about a longitudinal axis thereof and sealing means secured to the lateral sides of the louvre.

4. A louvre according to Claim 1 or 2, wherein the sheet supporting means comprises the bar and a sealing strip is secured to the lateral sides of the sheet.

5. A louvre according to Claim 1 or 3 wherein the sheet supporting means comprises the frame and a sealing strip is secured to the lateral members of the frame.

6. A louvre according to any one of the preceding claims, wherein the means for pivoting comprises pivot pins located in the ends of the bar or in the lateral members of the frame.

7. A louvre according to Claim 1, 3 or 5 or to Claim 6 when appended to Claim 1, 3 or 5, wherein the frame is fixed about the periphery of the sheet.

8. A ventilation louvre according to Claim 6 or to Claim 7 when appended to Claim 6, wherein each pivot pin is removable and is internally screw threaded for cooperation with an externally threaded withdrawing tool.

9. A ventilation louvre unit, which comprises two substantially parallel frame members, a plurality of ventilation louvres, each as claimed in any one of the preceding claims, which louvres extend between and substantially at right angles to the two frame members, pivot pins of each louvre seating in complimentary bushes, which bushes are disposed in the frame members, plates extending between the frame members at opposite sides of the plurality of louvres and a mechanism connected to all the pivot pins seated in one of the frame members for controlling the degree of rotation of each louvre.

10. A ventilation louvre unit according to Claim 9, wherein the louvres extend, in use of the unit, horizontally between the frame members, which frame members are upright.

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11. A ventilation louvre unit according to Claim 9, wherein the louvres extend, in use of the unit, vertically between the frame members, which frame members are horizontal.

12. A ventilation louvre unit according to Claim 9, 10 or 11, wherein the mechanism comprises a series of lever arms, each arm being secured to a pivot pin of a respective one of the louvres, the lever arms extending in parallel out of the planes of the respective louvres and being pivotally connected to a bar, which bar is connected to a single control lever.

13. A ventilation louvre, substantially as hereinbefore described with reference to, and as shown in, Figures 1, 2 and 3 of the accompanying drawing.

14. A ventilation louvre unit, substantially as hereinbefore described with reference to, and as shown in, Figures 1, 2 and 3 of the accompanying drawing.

15. A ventilation louvre unit whenever comprising the ventilation louvre of any one of Claims 1 to 8 and 13.

16. A structure whenever incorporating the ventilation louvre of any one of Claims 1 to 8 and 13 or the ventilation louvre unit of any one of Claims 9 to 12, 14 and 15.

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