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PATENT REQUEST: STANDARD PATENT/PATENT OF ADDITION

I, being the person identified below as the Applicant, request the grant of a patent to the person identified below as the Nominated Person, for an invention described in the accompanying standard complete specification.

Full application details follow.

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[54] Invention Title: GUARD ARRANGEMENT FOR ROOF GUTTERING

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ASSOCIATED PROVISIONAL APPLICATION(S) DETAILS
[60] Application Number(s) and Date(s): PL 5948 - 23.11.92

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DATED this 24th day of May 1993

RODNEY GEORGE WADE

By: [Signature]
Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
AUSTRALIA
NOTICE OF ENTITLEMENT

I, RODNEY GEORGE WADE of 4 Asher Court, Upper Coomera, Queensland, 4210, Australia, being the applicant in respect of Application No. PL 5948 and the complete application relating thereto, state the following:-

The person nominated for the grant of the patent is the actual inventor

The person nominated for the grant of the patent is the applicant of the provisional application listed on the patent request form

RODNEY GEORGE WADE
By his Patent Attorneys
CULLEN & CO.

Date: 25 May 1993
An arrangement for preventing leaves and debris from passing into roof guttering, said arrangement comprising the combination of a mesh adapted to completely overlie the guttering opening and to extend over the lower surface of the roof covering without deformation in the region of overlay, and a plurality of mechanical fasteners for securing an edge of the mesh to the uppermost outer lip of the guttering, there also optionally being included means for connecting the guttering to the roof. The invention also extends to a mesh which has a scalloped edge and a spring clip having a shape which conforms with the profile of the upper lip on roof guttering.
AUSTRALIA

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COMPLETE SPECIFICATION
FOR A STANDARD PATENT

Name of Applicant(s): RODNEY GEORGE WADE

Actual Inventor(s): RODNEY GEORGE WADE

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240 Queen Street,
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Invention Title: GUARD ARRANGEMENT FOR ROOF GUTTERING

Details of Associated Provisional Applications: No. PL 5948

The following statement is a full description of this invention,
including the best method of performing it 'own to me:
THIS INVENTION relates to gutter guards, that is, means for preventing leaves and other air borne debris and vermin which collects on the roofs of buildings, from being washed into the rainwater collecting guttering when it rains.

There are a large number of gutter guards currently available in the marketplace. They are on the whole designed to be inserted into the rainwater guttering by being deformed into a convex or concave shape upon insertion. Many of these gutter guards retain that shape when inserted. Others assume a downwardly sloping profile within the guttering. Such designs result in leaves and debris being trapped on the top or side of the gutter guard with the result that a barrier to the rainwater eventually forms and the rainwater washes over the side of the guttering. Even light to medium build up of leaves and debris can be of major concern where the water is required to be collected for personal use. In such situations, bacterial and other pathological organisms can develop in the leaves and debris as it decays and these are washed into the water catchment where total contamination occurs. Ingestion of such water without boiling it first can result in liver and intestinal diseases which can be fatal.

It is therefore an object of the present invention to provide a gutter guard arrangement which obviates or at least minimises the aforementioned disadvantages of known gutter guards.

Accordingly, one aspect of the present invention provides an arrangement for preventing leaves and debris from passing into roof guttering, said arrangement comprising the combination of a mesh adapted to completely overlie the guttering opening and to extend over the lower surface of the roof covering without deformation in the region of overlay, and a plurality of mechanical fasteners for securing an edge of the mesh to the uppermost outer lip of the guttering, there also optionally being included means for connecting the
guttering to the roof.

By virtue of the fact that the mesh completely overlies the guttering and extends onto the roof without deformation in the region of overlie, means that no depressions, or obstructions, are formed in the mesh where leaves and debris can collect. This, in essence, overcomes the problem of the prior art meshes.

The leaves and debris thus have free passage to be carried over the guttering opening and onto the ground whilst allowing the water to flow through the mesh into the guttering.

In addition, the relatively large space which is provided between the mesh and the very edge of the roof, means that air can circulate under any leaves which happen to land on the top of this section of mesh. This leads to rapid drying of the leaves when it stops raining, with little opportunity for decay. Such dried leaves will also be readily blown off by any breeze.

According to another aspect of the invention there is provided a mesh when used for preventing leaves and debris from passing into a roof guttering, said mesh having an aperture size sufficient to permit the passage of rainwater therethrough but not to permit the passage of leaves and debris, and having a rectangular dimension to enable it to extend lengthwise over at least a section of the guttering opening and up over a portion of the lower surface of the roof covering, said mesh being scalloped along the edge which extends over the lower surface of the roof covering, the scalloping corresponding with the ridges in the roof covering profile.

A third and final aspect of the invention concerns a mechanical fastener per se. According to this aspect, there is provided a mechanical fastener when used for securing a mesh to the uppermost outer lip of roof guttering, said mechanical fastener comprising a spring clip adapted to conform to the profile of said lip.

The mesh can be fabricated from any suitable
material for the purpose, particularly plastics and metals, with polyethylene being preferred. The size of the apertures in the mesh will depend upon the nature of the leaves and/or debris in the area where it is to be used. Generally, for most applications the mesh aperture size will be of the region of 5 mm x 5 mm to 15 mm x 15 mm, most preferably approximately 12 mm x 12 mm.

The mechanical fasteners employed will be selected according to the particular profile of the uppermost outer lip of the guttering. For inwardly turned lips, a male fastener in the form of a slotted billet is preferred. Such a slotted billet is suitably conformed to the profile of the lip, that is, it is suitably cylindrical, and is fractionally smaller in cross-section than the lip so that it can be snugly accommodated therein by temporary deformation of the very edge of the lip. The slot in the billet enables a strand of the mesh to be inserted therein prior to placement of the billet into the space defined by the inwardly turned lip.

For outwardly turned lips, or, indeed, inwardly turned lips, a female fastener preferably in the form of a clip or, more preferably, a spring clip can be used. The clip will be such as to fit over the outer strand of the mesh prior to being clipped over the lip of the guttering. The clip can have one leg longer than the other which can be cropped to suit various guttering lip profiles. Cropping of the leg allows precise placement of the mesh so as to prevent the capillary action of water along the mesh strands and over the guttering edge.

For guttering not having a roll lip, fixing can be achieved by using an adaptation of the abovementioned clips or by using conventional mechanical fixing techniques.

The arrangement described can be utilized for tiled or metal roofing. In the case of tiled roofs the edge of the mesh which overlaps the lower edge of the tiles, extends up under the second row of tiles.
Installation is effected by pushing back the second row of tiles prior to placing the mesh. The mesh is placed in situ by overlaying the guttering opening and the first row of fully exposed tiles with the mesh and simultaneously aligning one edge of the mesh with the lip of the guttering. The mesh is then secured to the lip with the mechanical fasteners referred to above. The second row of tiles is finally slid back down into position over the mesh, and the tiles are secured to manufacturers specifications.

In the case of metal roofs, it is necessary to ensure that the edge of the mesh overlying the lower edge of the roof, is in close contact with the roof at all times. This is achieved by the use of a strip of metal which is contoured to conform with the profile of the metal roofing. This metal strip is clamped against the metal roof, with the mesh trapped between. Fixing is achieved by the use of pins such as screws, pot rivets, or nails which extend through the metal strip, mesh and roofing to the underlying purlin. The strip is suitably positioned so as to overlie the edge of the mesh, thereby ensuring the smooth flow of rainwater down the roof.

Preferred embodiments of the invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a cross-sectional view of an arrangement according to the invention fitted to a tiled roof;

Figure 2 is a top perspective view of the arrangement of Figure 1;

Figure 3 is a cross-sectional view of an arrangement according to another aspect of the invention fitted to a metal roof;

Figure 4 is a top perspective view of the arrangement of Figure 3;

Figure 5 is a cross-sectional view of an arrangement fitted to a metal roof according to a still further aspect of the invention;
Figure 6 is a top perspective view of the arrangement of Figure 6;
Figure 7 is a perspective view of a male clip according to the invention;
Figure 8 is a perspective view of a female clip according to the invention; and
Figure 9 is a plan view of a portion of mesh according to the invention.
In all the drawings, like reference numerals refer to like parts.

Referring to Figures 1 and 2, the arrangement comprises a rainwater mesh 10 manufactured from polyethylene polymer having uniform dimensioned square apertures measuring 12 mm x 12 mm. The mesh is secured to the uppermost outer lip 11 of a roof guttering 12 by means of metal spring clips 13 and is clamped in position along its upper longitudinal edge between a first row of tiles 14 and a second row of tiles 15 as shown at 16. Item 17 is the fascia to which the guttering 12 is fitted and items 18 and 19 are the purlins and roof truss, respectively.

It can be seen that the mesh angles downwardly over the upper edge of the roof guttering so that any leaf litter and other debris can be carried over the edge of the guttering without blocking the opening to the guttering or accumulating near the guttering.

Figures 3, 4, 5 and 6 show the arrangement adapted for use on metal roofs 20 having two different profiles. Like all metal roofs, these roofs 20 each have a profile comprising ridges 21 and troughs 22. The arrangement consequently includes the use of a strip of correspondingly profiled metal 23 for securing the upper edge of the mesh 10 firmly against the roof covering. This strip is secured by nails, rivets or screws 24 to the roof covering and underlying purlin 18. The strip of metal 23 is suitably angled against the roof covering so that there is no interruption to the flow of rainwater down the roof.
The mesh 10 is captured on the lip of the guttering 11 in the same manner as in the previous illustration by the use of spring clips 13.

A typical spring clip 13 is shown in more detail in Figure 6. It is basically a high tensile stainless steel clip of semi cylindrical configuration, having a recess 30 in which a strand of the mesh 10 is accommodated when placed in situ on the lip of the guttering.

Another form of mechanical fastener is illustrated in Figure 5. This is a male fastener 31 comprising a cylindrical plug of plastics material with a slot 32 in which a strand of the mesh 10 is inserted for retention. The plug is placed in the curled lip of the guttering by slightly deforming the guttering. The guttering returns to its original configuration once the plug is in place.

An example of a mesh for use on the profiled metal roof of Figures 3 and 4 is illustrated in Figure 7. This mesh 33 has one longitudinal edge 34 which is scalloped with recesses 35 to permit it to follow the contours of a metal profiled roof covering. The recesses are formed to fit over the ridges of the roof covering and the remaining portions overlie the troughs of the roof covering.

For the corrugated roofing of Figures 5 and 6, it is not necessary for the mesh to have a scalloped edge as the ridges are relatively shallow. In this case, it is sufficient to form slots which correspond.

It will be appreciated from the foregoing description that the present invention provides a substantial improvement over existing mesh arrangements for roof guttering.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS.

1. An arrangement for preventing leaves and debris from passing into roof guttering, said arrangement comprising the combination of a mesh adapted to completely overlie the guttering opening and to extend over the lower surface of the roof covering without deformation in the region of overlay, and a plurality of mechanical fasteners for securing an edge of the mesh to the uppermost outer lip of the guttering, there also optionally being included means for connecting the guttering to the roof.

2. An arrangement as claimed in Claim 1, wherein the mesh is scalloped along the edge which extends over the lower surface of the roof covering, said scalloping corresponding with the ridges in the roof covering profile.

3. An arrangement as claimed in Claim 1 or Claim 2, wherein said mesh is of plastics material having screening apertures of approximately 12 mm x 12 mm.

4. An arrangement as claimed in any one of Claims 1-3, wherein said mechanical fasteners are spring clips which fit over the outer lip of the guttering.

5. An arrangement as claimed in any one of Claims 1-3, wherein said mechanical fasteners are slotted billets which fit into the outer lip of the guttering.

6. An arrangement as claimed in any one of the preceding claims and including means for connecting the guttering to a metal roof covering.

7. An arrangement as claimed in Claim 6, wherein said connecting means comprises a strip of metal which is contoured to conform with the profile of the metal roof covering, and fixing pins for securing the strip of metal to the overlying section of mesh.

8. A mechanical fastener when used for securing a mesh to the uppermost outer lip of roof guttering, said mechanical fastener comprising a spring clip adapted to conform to the profile of said lip.

9. A mesh when used for preventing leaves and
debris from passing into a roof guttering, said mesh having an aperture size sufficient to permit the passage of rainwater therethrough but not to permit the passage of leaves and debris, and having a rectangular dimension to enable it to extend lengthwise over at least a section of the guttering opening and up over a portion of the lower surface of the roof covering, said mesh being scalloped along the edge which extends over the lower surface of the roof covering, the scalloping corresponding with the ridges in the roof covering profile.

10. A mechanical fastener substantially as herein described with reference to the accompanying drawings.

11. An arrangement for preventing leaves and debris from passing into roof guttering substantially as herein described with reference to the accompanying drawings.

DATED this 25th day of May 1993

RODNEY GEORGE WADE

By his Patent Attorneys

CULLEN & CO.
An arrangement for preventing leaves and debris from passing into roof guttering, said arrangement comprising the combination of a mesh adapted to completely overlie the guttering opening and to extend over the lower surface of the roof covering without deformation in the region of overlay, and a plurality of mechanical fasteners for securing an edge of the mesh to the uppermost outer lip of the guttering, there also optionally being included means for connecting the guttering to the roof. The invention also extends to a mesh which has a scalloped edge and a spring clip having a shape which conforms with the profile of the upper lip on roof guttering.
Fig. 4.