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S. L. RAPAPORT

3,479,130

MICROBE GROWTH RETARDATION IN SHINGLE ROOFS

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FIG. 1

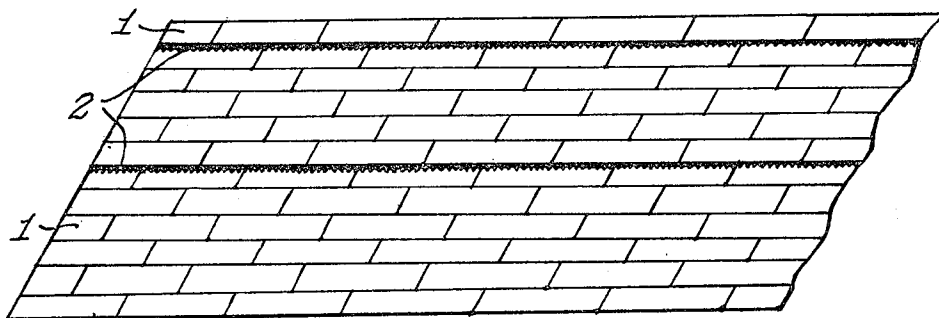


FIG. 2

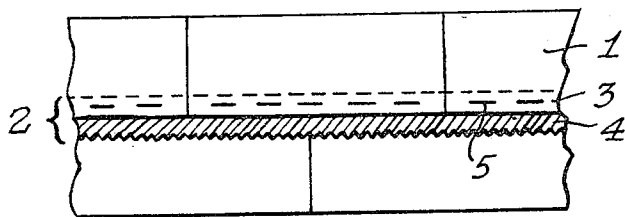


FIG. 3

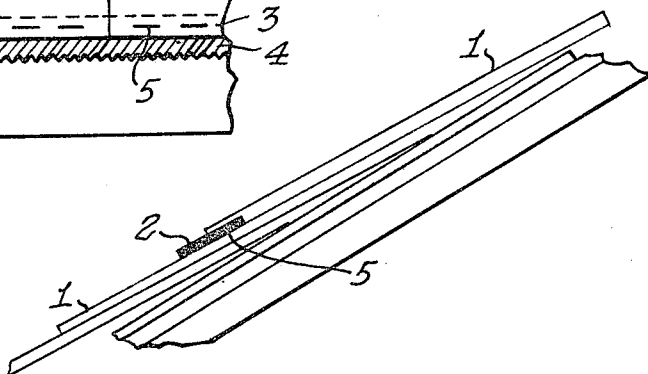


FIG. 4

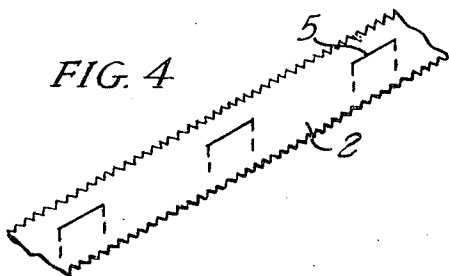


FIG. 5

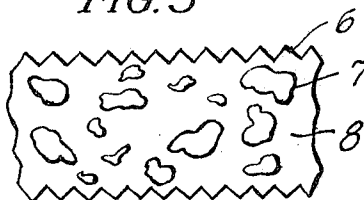
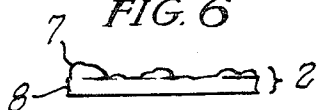


FIG. 6



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MICROBE GROWTH RETARDATION IN SHINGLE ROOFS

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Continuation-in-part of application Ser. No. 398,624,
Sept. 23, 1964, now abandoned. This application
Nov. 17, 1967, Ser. No. 689,219

Int. Cl. A611 3/00; B27k 3/16, 3/22

U.S. Cl. 21—61

8 Claims

ABSTRACT OF THE DISCLOSURE

A bimetallic strip for attachment to shingle roofs to prevent discoloration by biological action. The two metals employed in the strip are selected to form an electrical couple to increase ionic release. At least one of the metals is selected on the basis of the biocidal effect of its ionic solutions.

Background of the invention

This is a continuation-in-part of my copending application Serial No. 398,624, filed September 23, 1964, and now abandoned for Microbe Growth Retardation In Asphalt Shingle Roofs.

In many tropical and semi-tropical areas it is quite common for roofs to be subject to a dark discoloration with age. While the exact cause of this phenomenon is not known, it is believed to be the result of biological action, such as microbial or fungal growths. The discoloration may be due to the growth itself or may be produced indirectly as a result of the organism's metabolic products. When the proper conditions exist, the discoloration can be so extreme as to change a white roof to black in a period of a few years. Northerly exposed roofs change more rapidly than southerly exposed roofs and the color change appears to be more pronounced in some neighborhoods than in others. The change affects roofs of all colors and, in all known instances, the color changes are toward black. The blackening is not only unsightly but also has adverse economic effects in that it increases the heat absorption of the roof and thus defeats the very purpose of the light roof in hot climates.

It has been observed that when lead, copper, or zinc is exposed on the roof, as pipe or flashing for example, the water run-off pattern is free of darkening. This is probably due to the growth-retarding effect of the ions of slightly soluble salts of these elements. It has been suggested that thin metallic strips, such as copper, be mounted on shingled roofs to prevent such darkening. However, it is believed that an improvement in the efficiency of such strips may be achieved by a synergistic effect resulting from the use of two separate metals in such a strip. Accordingly, it is a primary object of the present invention to provide a metallic biocidal strip in which the biocidal effect is enhanced to a greater degree than is possible by the use of any single metallic element.

Another object is to provide a novel method for the manufacture of such a strip.

Summary of the invention

The present invention comprises a bimetallic strip for application at spaced intervals along a roof. The strip is formed of two metals which form an electrocouple, at least one of the metals being of a type to release ions having a biocidal effect. After application of such strips to a roof, normal weathering will result in the production of ions which will be spread over the surface of the roof by the action of rain or dew.

Brief description of the drawing

For a further understanding of the present invention, attention is directed to the following description, the appended claims and the figures of the attached drawing, wherein:

FIG. 1 illustrates an asphalt shingle roof protected by bimetallic strips in accordance with the present invention;

FIG. 2 is an enlarged view of a portion of the roof of FIG. 1;

FIG. 3 is an enlarged end view of the roof of FIG. 1;

FIG. 4 is a detail of a metallic strip in accordance with this invention;

FIG. 5 is an enlarged view of the surface of the bimetallic strip of FIG. 4; and

FIG. 6 is an end view of the bimetallic strip of FIG. 5.

Description of the preferred embodiment

The ions of a number of metallic elements have been found to have microbiocidal characteristics. These elements include, for example, copper, lead, and zinc. The objects of the present invention are achieved by applying to a roof surface bimetallic strips incorporating at least one such metal. If one of the metals of the bimetallic strip is electronegative with respect to the other, galvanic action will take place, accelerating corrosion of the anodic metal when exposed to moisture. This synergistically increases the effectiveness of the active metal by substantially increasing its ion release rate. Suitable combinations of metals for such bimetallic strips would include, for example, copper-lead, and zinc-iron.

With particular reference to FIGS. 1-3, there is illustrated a roof comprising shingles 1, which are attached to the roof in the usual fashion. Secured to the roof at spaced intervals along the shingle edges are bimetallic strips 2. Such strips may be, for example, approximately one inch in width and may be secured to the roof by common wire staples 5 spaced at twelve to eighteen inch intervals in such a manner that a portion 3 of each strip is positioned beneath the edge of a row of shingles while an exposed portion 4 may be contacted by precipitation. Although considerable variation in size and spacing of the bimetallic strips of this invention may exist depending upon atmospheric conditions, roof slope, etc., it is anticipated that such strips would be provided for at least every fourth row of shingles to a maximum spacing of possibly ten rows of shingles.

It should also be noted that the illustrated strip has a serrated edge. The purpose of such edge is to increase the metal exposure and, thus, the effectiveness of the strip.

It will be understood that various methods of manufacturing a strip having two exposed metals are available. However, a highly effective method in accordance with the present invention will result in a strip as shown in FIGS. 5 and 6 wherein a copper substrate 8 has deposited thereon solidified globules 7 of lead in a more or less random and dispersed pattern. This effect is achieved by first forming a copper strip and depositing thereon, by any suitable means, such as electrodeposition, a layer of lead. The composite strip is then heated to a temperature in excess of the melting point of the lead but below that of the copper. As the lead liquefies, it tends to cohere and form discrete globules. Upon cooling, these globules remain as illustrated in FIGS. 5 and 6 forming a highly effective bimetallic strip wherein both metallic elements are exposed to weathering. A similar technique may be employed in the formation of strips of other metallic elements.

It is to be understood that the present invention is not limited to the specific elements set forth but includes bimetallic roofing strips of any metals capable of form-

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ing electrocouples and releasing ions which are microbiocidal to the particular micro-organisms involved. Various other modifications of this invention will be apparent to those skilled in the art. Accordingly, the foregoing description is to be construed as illustrative rather than limiting. This invention is limited only by the scope of the following claims.

What is claimed is:

1. A microbiocidal roof structure comprising a plurality of exposed, spaced, longitudinally extending bi-metallic strips, each of said strips including two exposed elemental metals capable of forming an electrocouple, at least one of said metals being selected from the group consisting of copper, lead, and zinc.

2. The structure of claim 1 wherein said metals are copper and lead.

3. The structure of claim 1 wherein said metals are zinc and iron.

4. A microbiocidal strip comprising two exposed elemental metals capable of forming an electrocouple, at least one of said metals being selected from the group consisting of copper, lead, and zinc.

5. The strip of claim 4 wherein said strip is serrated along at least one edge to increase metal exposure.

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6. The strip of claim 4 wherein the body of said strip is formed of one metal and the other metal is secured thereto in discrete, spaced relationship.

7. The strip of claim 6 wherein said one metal is copper and the other metal is lead.

8. The strip of claim 7 wherein said lead is dispersed on the surface of the copper in the form of discrete, randomly distributed globules.

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U.S. Cl. X.R.

21—2, 58; 29—183, 196.3; 52—517; 161—213; 424—131, 140, 145, 147