J. C. WOODLEY.

SURFACE EMBOSSED ROOFING SHEET AND THE LIKE.

APPLICATION FILED MAY 23, 1917.

1,366,146. Patented Jan. 18, 1921.

Fig. 1

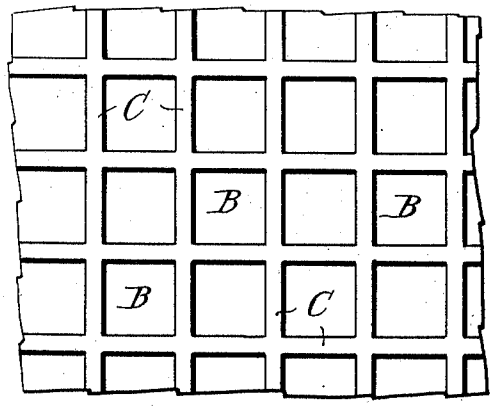


Fig. 3.

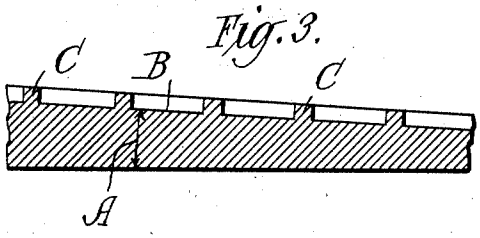


Fig. 4.

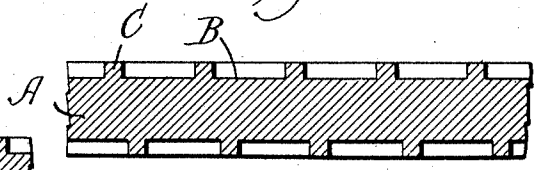


Fig. 2.

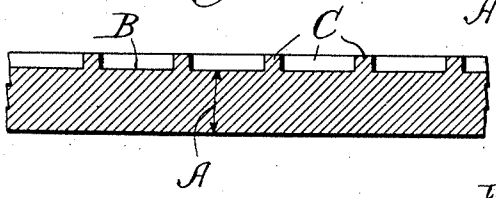
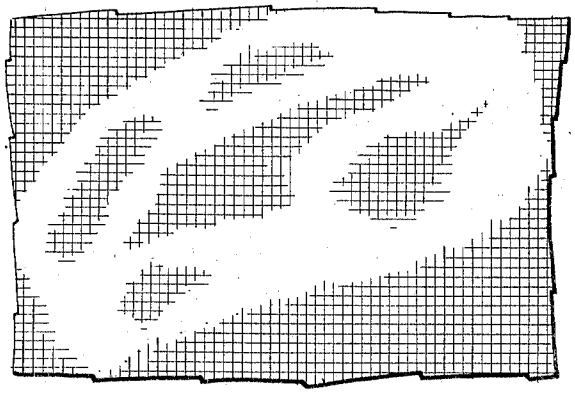


Fig. 5.



Inventor

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SURFACE-EMBOSSED ROOFING-SHEET AND THE LIKE.

1,366,146. Specification of Letters Patent. Patented Jan. 18, 1921.

Application filed May 23, 1917. Serial No. 170,414.

To all whom it may concern:

Be it known that I, JAMES C. WOODLEY, a citizen of the United States, residing in Evanston, Illinois, have invented certain new and useful Improvements in Surface-Embossed Roofing-Sheets and the like, of which the following is a specification.

The invention provides a new bituminous composition roofing in sheet form, whether in continuous large sheets or in smaller sheets intended to be applied as shingles, and, of course, the material may be used in various sizes and for various other purposes.

The sheets of my invention are embossed according to a regular and predetermined design which permits economy while giving the product a more attractive appearance than has heretofore been produced, which serves as a means of identification between different brands or qualities, and which has certain other advantages and distinguishing features referred to in detail hereinafter.

The accompanying drawings illustrate embodiments of my invention.

Figure 1 is a plan of a portion of a sheet;

Figs. 2, 3 and 4 are vertical sections illustrating different styles;

Fig. 5 is a plan of another style.

The bituminous composition roofing of which my product may be made includes specifically the material described in Woodley Patent No. 1,156,122 and generally all other roofings in sheet, tile or shingle form, which have bituminous or similar surfacing susceptible of being treated as herein described.

It is old in the art when making the so-called rubber roofings of commerce which ordinarily consist of a "dry felt" base which has been saturated with waterproofing material, to apply a superficial coating of bituminous or other waterproofing material by passing the said sheet through a bath of said waterproofing coating and allowing as much as desired of said coating to remain on the surface of the sheet, or by applying said coating to one or both surfaces of the sheet and then passing the coated sheet through squeeze rolls, which remove the surplus coating. In many cases the coating process is done by passing the saturated sheet between two rolls mounted one above the other and allowing the lower roll to revolve in a bath of the surface coating, which roll picks up some of said coating and applies it to the underside of said sheet; while at the same time, if desired, an additional supply of the surface coating is supplied to the top of the sheet before it reaches the rolls and by the spacing allowed between the rolls the thickness of the coating on the sheet is regulated. The rolls, if preferred, are sometimes set horizontally in the same plane with the sheet passing down between them from above and the surface coating supplied on one or both sides of the sheet before it passes between said rolls. Or the coating may be supplied to the surface in any desired manner, but ordinarily the coated sheet passes between revolving rolls, which remove the surplus coating. Ordinarily the consistency of the coating is such that some of said coating sticks to the surface of the coating rolls and in doing so causes the coated surface on said sheets which are passing away from said coating rolls to have a somewhat roughened surface, which is often known in the trade as an "alligator finish" because it resembles somewhat alligator leather. The effect produced in this way is purely an accidental and ordinarily a necessary feature in the process of coating sheets of composition roofing. In some cases the finished sheets of said composition roofing have been made with a smooth finish or surface by using special means to avoid or eliminate the natural alligator finish, and to prevent the bituminous material from sticking to the rolls.

For interior wall coverings it has been common to form sheets in hollow relief, that is, with raised portions on the bottom. Coverings of this sort have also been provided with a raised pattern made of a different material applied on one surface of the sheet. But I do not know of any case in which roofing composition has been used for such purposes or in which even interior wall coverings have been provided with an embossment which is integral with the foundation sheet and which is on one surface only, with a plain or flat back surface.

And, in the roofing art it is new to treat the surface of bituminous composition sheets by intentionally embossing said surface with a predetermined design. The design produced by this invention is repeated at regular intervals in the length of the sheet and is clearly distinguished by its prearranged regular character from the haphazard alligator finish. The predetermination of the

design also permits the sheets to be made with an accurately controlled relief. The quantity of material which stands in relief above the lowest plane of the design is of course not effective in preventing leakage, and by controlling the height of such relief at all points and the quantity of material in relief the design may be most efficiently made and the sheets, weight for weight, will be more efficient than those having the alligator finish with the haphazard design.

The improved product of my invention may be made in any usual or suitable way. Methods and apparatus for the purpose are described in the Woodley application for Patent No. 10,239, filed February 24, 1915. Speaking generally the method consists in forming the composition into sheets and (either in the forming operation or in a subsequent operation) impressing the design on it while in a plastic condition. The impressing means may be compression rolls with their surfaces formed in the desired design or cloth or other fabric whose design is to be repeated on the sheet. Other methods and apparatus are referred to in detail in the aforesaid application. The impressing of the design on the material while plastic makes the raised portions of the design absolutely integral with the remainder of the sheet so that these raised portions will be of the same durable material as the remainder of the sheet and even when they wear away there will be no change from one material to another.

It has been proposed to make roofing sheets with elevations of considerable height by applying additional comparatively thick layers of material on to the sheet already formed, but such a product is more expensive to manufacture and the raised portions have not the absolutely integral character of the raised portions of my embossed sheets and they are not intended to and do not produce the appearance of a practically uniform finish which is the chief characteristic of my improved sheets.

Referring to the particular designs illustrated, the sheet comprises a body portion A of any usual or suitable thickness on the surface of which is a predetermined design consisting (in Figs. 1 to 4) of depressed square panels B surrounded by raised portions C. The sheet or shingle may be of uniform thickness as indicated in Fig. 2 or tapered in thickness as in Fig. 3 (the tapered form being especially applicable to shingles) and the embossment B, C may be on only the top face as in Figs. 2 and 3 or on both faces as in Fig. 4. In the latter case the embossment on the bottom has no necessary relation to that on the top. This is indicated by showing it out of register therewith, and it may be different in design and proportions. In Fig. 5 the design of the embossment is an imitation of a textile fabric. Except in this respect the sheet may be like any one of those above described.

The thickness of the embossment is comparatively slight. It may vary within substantial limits, but is never a very large fraction of the total thickness of the embossed sheet. In the case illustrated in Figs. 1, 2, 3 and 4 the elevated portions C of the embossment are about one-tenth as thick as the remaining solid portion of the sheet. The ordinary roofing sheet is an eighth of an inch or less in thickness, from which consideration the thickness of the embossment is indicated. The design of Fig. 5 may be made much finer than that of Fig. 1 and with less thickness of the raised portions of the design.

The raised portion of the design in Fig. 1 covers about half the area of the sheet. It gives an increased overall thickness which stiffens the sheet to a greater extent than if the same quantity of material were used in a smooth faced sheet. This quality is useful especially in making shingles which are comparatively thin at one edge and therefore need stiffening. The depressions in the surface of the sheet serve to hold a considerable quantity of the soapstone or other anti-sticking material which is generally used in the process of manufacture. The embossment is also useful in rendering less conspicuous any variations in color or irregularities in the surface or any bulging or wrinkles which occur during or after the laying of the sheets; these being mere imperfections in appearance which do not necessarily affect the excellence of the sheet or its usefulness, but which nevertheless affect its salability. The uniform character of the design and its comparative smallness are such as to produce rather a certain superficial finish for the sheets than a separate design or separate figures standing out against a plain background. As specific examples of the comparative smallness of the design I refer to three products which I have made, the first embossed in a hexagonal design on both faces, the length of each side of the hexagon being about five-fiftieths of an inch, the second being embossed in a square design with raised lines each about two-fiftieths of an inch in thickness and separated a distance of eight-fiftieths of an inch between centers and the third embossed in a textile design comprising coarse ridges about six-fiftieths of an inch apart between centers overlaid by finer ridges about three-fiftieths of an inch apart. This invention is peculiarly applicable to sheets made of the composition described in the aforesaid Woodley patent, which is a fibrous bituminous composition, the fibers being distributed homogeneously throughout the binder. Sheets of this composition are improved by

the stiffening effect of the embossment (as compared with flat sheets containing the same quantity of the composition). And the distribution of the fibers throughout the thickness of the sheet aids in preserving the embossment and preventing its flattening out when the material is softened by the heat of the sun.

I may employ any desired design, either to imitate cloth, leather or other fabric, or for arbitrary ornamental purposes or for identification of the goods in the manner of a trade-mark or other special mark, and the design may be raised above the surrounding material or may be depressed below the same, or may be partly above and partly below the surrounding material. The sheets may be either in rolls or cut sheets of any size or may be cut into so-called tiles or shingles and these so-called tiles or shingles decorated in accordance with the present invention; all these articles being included in the roofing in sheet form to which the invention relates. This class of material, though known commercially as roofing, is used for sidings of temporary buildings and for various other analogous purposes, and my invention is applicable with advantage to all these uses of the material.

The claims made herein are directed to the product broadly, regardless of the structure of the body of the sheet to which the embossment is applied and are also directed specifically to such embossed sheets composed of a bituminous binder with fibers distributed homogeneously throughout the entire thickness. The specific improvement which consists in applying such embossment to sheets made of a base with a surface coating or layer of bituminous material is the invention of Ray P. Perry.

What I claim is—

1. Bituminous composition roofing in sheet form having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than distinct figures on a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the sheet and the thickness of the sheet through the raised portion of the design being increased to the extent of the depth of such portions.

2. Bituminous composition roofing in sheet form having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than distinct figures on a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the sheet and the thickness of the sheet through the raised portion of the design being increased to the extent of the depth of such portions, the depth of the embossment being only a small fraction of the thickness below the embossing.

3. Bituminous composition roofing in sheet form having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than distinct figures on a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the sheet and the thickness of the sheet through the raised portion of the design being increased to the extent of the depth of such portions, the raised portions covering not more than about one-half the area and materially increasing the stiffness of the sheet in proportion to the quantity of material therein.

4. A bituminous composition shingle having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than separate figures standing out against a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the shingle and the thickness of the shingle through the raised portions of the design being increased to the extent of the depth of such portions.

5. A bituminous composition shingle having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than separate figures standing out against a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the shingle and the thickness of the shingle through the raised portions of the design being increased to the extent of the depth of such portions, said shingle being tapered in thickness but the embossing being of uniform depth throughout the length of the shingle.

6. A bituminous composition shingle having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than separate figures standing out against a plain background, the design being impressed on the sheet while plastic so that the raised por-

tions are integral with the remainder of the shingle and the thickness of the shingle through the raised portions of the design being increased to the extent of the depth of such portions, said shingle being tapered in thickness but the embossing being of uniform depth throughout the length of the shingle, the raised portions being not more than about one-half the area so as to provide a considerable stiffness in proportion to the quantity of material.

7. A bituminous composition roofing in sheet form composed of a bituminous binder with fibers distributed homogeneously throughout the entire thickness of the sheet, such roofing having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than distinct figures on a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the sheet and the thickness of the sheet through the raised portion of the design being increased to the extent of the depth of such portions.

8. A shingle made of a composition comprising a bituminous binder and fibers distributed homogeneously and uniformly throughout the thickness of the shingle, said shingle having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than separate figures standing out against a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the shingle and the thickness of the shingle through the raised portions of the design being increased to the extent of the depth of such portions.

9. A shingle made of a composition comprising a bituminous binder and fibers distributed homogeneously and uniformly throughout the thickness of the shingle, said shingle having embossed on at least one of its surfaces a predetermined design repeated continuously at regular intervals, the design being so small as to produce the appearance of a practically uniform finish rather than separate figures standing out against a plain background, the design being impressed on the sheet while plastic so that the raised portions are integral with the remainder of the shingle and the thickness of the shingle through the raised portions of the design being increased to the extent of the depth of such portions, said shingle being tapered in thickness and the embossment thereon being of uniform depth throughout the length of the shingle.

10. As an article of manufacture, a sheet of roofing material having on its surface integral ridges of predetermined cross-sectional area, said ridges being spaced less than 1″ apart.

11. As an article of manufacture, a sheet of waterproof roofing material having on its surface integral ridges of predetermined cross-sectional area, said ridges being spaced less than 1″ apart and covering less than ½ of the total area of said surface.

12. As an article of manufacture, a sheet of waterproof roofing material having on at least one side thereof a plurality of intersecting ribs of predetermined cross-sectional area integral with the material on which the ribs are located, whereby a plurality of pockets of predetermined dimensions are formed said ribs being spaced less than 1″ apart.

13. As an article of manufacture, a sheet of roofing material, said material being provided with a plurality of predetermined, depressed portions spaced less than 1″ apart for anti-sticking material.

In witness whereof, I have hereunto signed my name.

JAMES C. WOODLEY.