R. P. PERRY.

BITUMINOUS CONSTRUCTION MATERIAL AND PROCESS OF MAKING THE SAME.

APPLICATION FILED APR. 26, 1917.

1,409,767. Patented Mar. 14, 1922.

Fig. 1

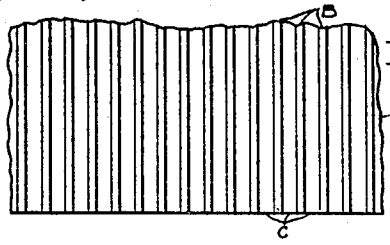


Fig. 3

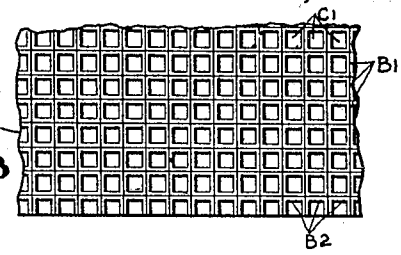


Fig. 2



Fig. 4

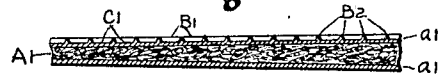


Fig. 9

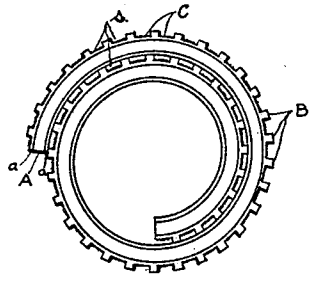


Fig. 5

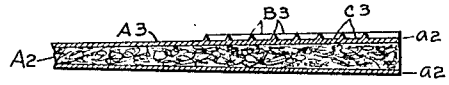


Fig. 8

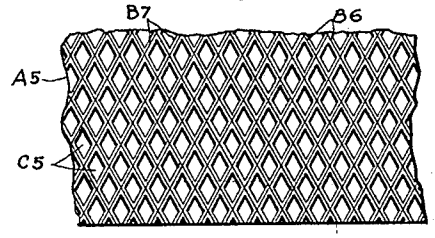


Fig. 6

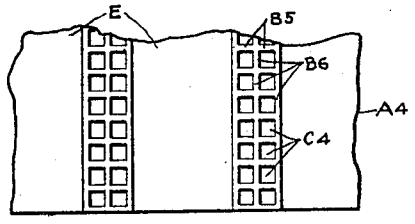


Fig. 11

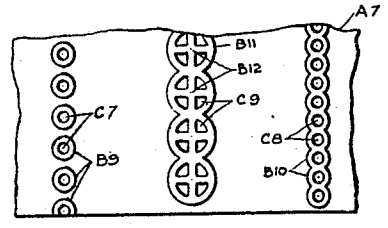


Fig. 7

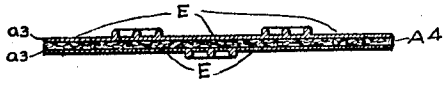
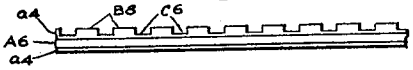


Fig. 10



INVENTOR

Ray P. Perry

BY

Edward M. Evarts

ATTORNEY

UNITED STATES PATENT OFFICE.

RAY P. PERRY, OF UPPER MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE BARRETT COMPANY, A CORPORATION OF NEW JERSEY.

BITUMINOUS CONSTRUCTION MATERIAL AND PROCESS OF MAKING THE SAME.

1,409,767. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed April 26, 1917. Serial No. 164,663.

To all whom it may concern:

Be it known that I, RAY P. PERRY, a citizen of the United States, residing at 22 Parkside, Upper Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Bituminous Construction Materials and Processes of Making the Same, of which the following is a specification.

This invention relates to roofing or construction materials of a bituminous or analogous character. Such materials are generally made of a base of so-called "dry" roofing felt, saturated with a waterproofing compound such as bituminous material, as asphalt, for example, and usually are coated with a waterproofing substance generally of a bituminous character, as pitch or asphalt.

Whatever the exact nature and construction of the bituminous or analogous material may be, it is the object of my invention to provide either both or but one of the sides of such roofing or construction material, generally the weather side, with a surface of such a character that the construction material has superior wearing qualities and the outer layer of bituminous material, as the coating on the saturated felt, for example, is strengthened and reinforced.

Another object of my invention is to provide such a character of surface for the roofing material that when the material is packed in layers or is rolled in a series of convolutions to form a roll, the successive layers or convolutions have a minimum likelihood of sticking to one another. This sticking together of the successive layers or convolutions of the roofing material is undesirable and harmful, often resulting in tearing away, or at least injuring and defacing the surface of the successive layers or convolutions of the construction material. Moreover, the character of surface provided by me for the roofing material is such that the roofing material may be applied to the roof, wall or other surface where the same is to be laid with the least possible injury to the more or less fragile surface or surface coating of the same. Ordinarily the shoes of the workmen applying the roofing material to the structure on which the same is to be laid, contact heavily with the surface of the roofing material, to the injury and damage of the same, especially from turning on the heels or from slightly projecting nails in the bottoms of the shoes. By my construction I minimize such injuries without sacrificing any desirable properties of my roofing material.

I attain these desirable properties and others subsequently to be enumerated by providing the roofing or construction material of bituminous or analogous material with a series of predetermined raised ribs or ridges integral with and made of the same material as the coating of the construction material.

By the terms "ribs" and "ridges" I intend to indicate that portion of the coating on the sheet proper which is at the points of maximum total thickness of the sheet, there being portions of minimum thickness which I designate by the term "depressions." Some forms of roofing or construction material are sometimes made with one or both surfaces thereof covered with sand, crushed slate, grit, gravel, etc., and such sheets naturally have a small variation in thickness due to the varying size and disposition of the irregular particles on the surface thereof. In some cases I may provide roofing or construction material having such a covering (particularly where such covering consists of relatively fine particles, such as sand), with ribs or ridges, the irregular mineral surfacing material being broken or otherwise formed so as to acquire the desired shape. Primarily, however, I treat sheets which are covered with finely powdered soapstone, talc and analogous material, the particles of which are relatively very fine and do not materially affect the thickness of the sheet so far as such dimension is referred to herein.

The exact disposition and dimensions of the ribs or ridges are generally immaterial, and may be varied to suit different conditions. Good results may be obtained by making the ribs or ridges of a depth equal to less than $\frac{1}{3}$, generally $\frac{1}{20}$ to $\frac{1}{3}$ of the minimum thickness of the sheet of roofing material. It is essential, in order that the

sheet be provided with the necessary depth of coating or protecting bituminous or similar material, that the height of the ridges or the depth of the pockets or depressions between the ridges be definitely predetermined. It is obvious that whenever ribs or ridges are located close together it is immaterial whether the surface of the sheet be described by referring to the upstanding ribs or by referring to the corresponding depressions defined thereby. The depressions may, of course, be a set of parallel grooves, or sets of intersecting grooves or may be mere pockets as outlined by the location of the ribs or ridges which define and locate the same, and determine their disposition and dimensions. Such predetermination of the height of the ribs or ridges and the depth of the pockets or depressions is of considerable importance as rendering certain the provision of a necessary minimum thickness of the weatherproofing coating when such a coating is applied to a saturated or otherwise waterproofed sheet of felt or fabric. The total area occupied by the ridges on the surface of the roofing material to which the ridges are applied may be and generally preferably is less than $\frac{1}{2}$, usually about $\frac{1}{20}$ to $\frac{1}{3}$ of the area of the surface to which the ridges are applied, though such proportions may be varied as desired.

The essential point, however, is that the number, location and dimensions of the ribs, ridges or elevated portions, and also of the depressed portions, are predetermined, instead of being indeterminate or relatively haphazard, as in the case of the ordinary so-called "rubber roofings" of commerce, and especially such roofings as have the so-called "alligator" or rough surface. In accordance with my invention, when it is desired to reduce to a minimum the amount of material used in the ribs or elevated portions, such ribs may be made in the form of narrow lines or ridges of predetermined small cross-section, and the number of such ribs or ridges may be made relatively small. These ribs or ridges serve also to define or mark off the lower or relatively depressed portions of the sheet, which depressed portions are, as stated, also of predetermined dimensions and have a substantially definite minimum thickness so as to insure a definite wearing and weathering strength.

Referring to the drawings wherein I have illustrated several modifications of my invention, Fig. 1 shows in plan view a portion of one type of roofing material made in accordance with my invention. Fig. 2 shows in cross-section the roofing material illustrated in Fig. 1. Fig. 3 shows in elevation and Fig. 4 in cross-section a further modification of my invention.

Fig. 5 shows in cross-section still another modification.

Fig. 6 shows an elevation and Fig. 7 a cross-section of a still further modification of my invention.

Fig. 8 shows in elevation another modification of my invention.

Fig. 9 shows in end elevation the roofing material illustrated in Figs. 1 and 2 but rolled in convolutions to form a roll for the purpose of emphasizing one of the main advantages of my form of construction.

Fig. 10 shows an end elevation of a further modification of my invention, and Fig. 11 shows in plan view still another modification.

Referring to the species of my invention illustrated in Figs. 1 and 2, A is a strip of bituminous roofing material, having the usual coatings *a*, *a* of bituminous material, such as asphalt, pitch, etc., thereon. On the upper or weather surface of the roofing material are the ribs B, B defining between them the pockets or depressions, C, C, C. In the species under discussion the ribs are substantially square or rectangular in cross-section and substantially straight in longitudinal dimension. However, any desired form of cross-sectional character may be used with success for such ribs. Also, the ribs may be curved or may otherwise be varied from the straight line form illustrated. From an inspection of Fig. 2 it may be noted that while the ribs are not very high, forming but a small fraction of the entire depth of the roofing material, they form a considerable proportion of the maximum depth of the coating, where such coating is used, serving to reinforce the same. Since the ribs are of comparatively small elevational area, by which I mean that the ribs occupy but a small portion of the area of the surface to which they are applied, they reinforce the sheet and increase the maximum thickness of the coating on the roofing material, without depriving the unribbed portions of the surface of the roofing material to which the ribs are applied of more than a small amount of coating material. This point is of considerable practical importance as insuring that no part of the bituminous or equivalent coating will be unduly thinned and weakened to the injury and impairment of the weathering properties of the roofing material.

It is immaterial for the purposes of my present invention just how the ribs are produced. It is, however, essential, for the reasons already set forth, that the height of the ribs and the depth of the depressions, as well as their number and location, be predetermined, so as not to provide thin or weak spots in the surface of the roofing material. Generally the depressions are made by passing the sheet of roofing material, coated with bituminous material, between rolls, either or both of which have appro-

priate markings on them, according to whether one or both sides of the sheet of roofing material are to be provided with ribs or ridges. The sheet to be provided with such ribs or ridges may be passed between the ribbing or ridging rolls after being coated or formed, while it is still in quite a plastic condition; or it may be passed between such rolls when relatively cold, the bituminous material even when cold being generally capable of receiving and retaining the desired ribs or ridges. In any event the means and method whereby the ribs are formed are immaterial so far as my present invention is concerned.

In Figs. 3 and 4, wherein is illustrated another species of my invention, the strip A_1 of roofing material is shown provided with the coatings a_1, a_1, of bituminous material. The strip is tapered like the ordinary wooden shingle and is provided with two rows of ribs B_1 and B_2 at substantially right angles to each other, the intersecting ribs serving to define the pockets or depressions C_1, C_1. The ribs are shown as being triangular in cross-section but may be of any other desired cross-sectional character.

In Fig. 5 I have illustrated a structure similar to that shown in Figs. 3 and 4 wherein the tapered strip A is provided with the coatings a_2, a_2 and the intersecting ribs B_3 defining pockets C_3, except that in this case only the weather portion of the strip is provided with the reinforcing ribs or ridges, leaving the portion A_3 unribbed.

If desired, as shown in Figs. 6 and 7 illustrating a further modification of my invention, the ribs may cover only a part or portion of the area of the strip to which the same are applied. In this case both sides of the strip A_4 are provided with the coatings a_3, a_3 which are in turn provided with staggered series of intersecting ribs B_5 and B_6, defining the depressions C_4 and leaving a series of unribbed portions or areas E, E, E on both sides of the strip. The ribs B_5 and B_6 are here shown as being semi-circular in cross-section.

As shown in Fig. 8, the strip A_5 is provided with two series of ribs B_6 and B_7 intersecting to form non rectangular pockets C_5, the ribs being shown as coating the longitudinal sides of the strip at angles other than right angles. If desired, the ribs may cross each other and the sides of the strip at any desired angles, and may be curved in any desired way or be straight as desired.

While the area covered by the ribs or ridges may be and generally is less than the total area of the depressed portions, the reverse may be true. Such an arrangement is shown in Fig. 10 where the strip A_6, having the coatings a_4, a_4, is provided on one of its faces with the ribs B_8, defining the depressions C_6. In this case the area covered by the ribs is greater than the total area of the depressions. In any case it is to be noted that the essential feature in each of the modifications is that the dimensions of the ribs or ridges and of the depressions, also their number and disposition, be definitely predetermined for the reasons already set forth.

As shown in Fig. 11, the ribs may be curved, the strip A_7 being provided with various types of curved ribs as shown, one series of ribs B_9 is annular, and defines the enclosed circular depressions C_7; the ribs B_{10} are contacting annuli, defining the enclosed circular depressions C_8; while the ribs B_{11} are contacting annuli, each annulus being traversed by the connecting cross-shaped ribs B_{12}, the combined arrangement of ribs serving to define the depressions C_9 in the form of quarter circles.

By my construction the strip of roofing or construction material, and especially the outer weather covering or coating of the same is strengthened and reinforced without depriving the rest of the surface covering of any undue amount of coating material. By my mode of procedure I am enabled to regulate and predetermine the amount of material in the ribs and the depth and thickness of the depressed portions.

As previously stated, roofing materials prepared in accordance with my invention may be applied to the roof or other part of the structure on which the same is to be used with less damage and injury to the surface of the same caused by the workmen treading upon the same.

Similarly when the construction material made in accordance with my invention is packed in layers or rolled in convolutions to form a roll, there is less danger of the successive layers or convolutions sticking together, since such layers or convolutions will be in contact at only restricted portions, and not as formerly at all points of the overlapping areas. This point is clearly brought out in Fig. 9 in the case of a roll of construction material made like the material illustrated in Figs. 1 and 2.

It is often found desirable, especially where the ribs or ridges are formed while the strip is still hot and the bituminous or analogous material is quite soft, in order to prevent the strip from sticking to the ribbing rolls and to other strips shortly after its production, and while the surface of the bituminous coating is still quite plastic, to provide additional means, such as a fine powder of talc or soapstone applied to the surface, and also, if desired, just previous to ribbing or ridging, in order to prevent the strip from sticking to the ribbing rolls or to each other immediately after ribbing and before the bituminous material is cooled and hardened. In the case of the roofing mate-

rial of my invention the depressions serve the added function of providing reservoirs or pockets for holding a substantially predetermined amount or supply of such anti-sticking material, such as soapstone, talc, etc., as shown at s in Fig. 9.

While the absolute size and dimensions of the ribs and depressions are generally immaterial, I generally space the ribs a fraction of an inch apart, so that, in the case of ribs intersecting at right angles, for example, the said ribs may be spaced one-eighth of an inch apart, more or less, as desired, so that in such a case, there are about 64 depressions to the square inch. However, these figures are cited merely by way of example, as indicating that the ribs or ridges and the depressions defined thereby may be, and generally are, quite small, though their absolute size is generally immaterial and may be varied within wide limits.

Having described my invention, what I claim is:

1. As an article of manufacture, a sheet of roofing material having a base coated with a layer of waterproofing material, said layer having ridges of predetermined cross-sectional area thereon integral with said layer, said ridges being spaced less than 1″ apart.

2. As an article of manufacture, a sheet of roofing material having a base coated with a layer of waterproofing material, said layer having ridges of predetermined cross-sectional area thereon integral with said layer, said ridges being spaced less than 1″ apart and covering less than ½ of the total area of said layer.

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

4. As an article of manufacture, a sheet of roofing material coated with a layer of waterproofing material, said layer having a plurality of integral, parallel ridges spaced substantially equally and a predetermined distance less than 1″ apart, and of predetermined cross-sectional area, and a similar series of ridges transverse to and intersecting the first series, whereby a series of uniform pockets of predetermined dimensions are produced on the sheet.

5. As an article of manufacture, a sheet of roofing material coated on at least one side with waterproofing material, said coating being provided with a plurality of predetermined, depressed portions spaced less than 1″ apart for anti-sticking material.

6. As an article of manufacture, a coated sheet of roofing material of substantially uniform thickness throughout its entire extent, said coating having thereon a plurality of predetermined depressions whose centers are substantially ⅛″ apart.

7. As an article of manufacture, a sheet of roofing material saturated with waterproofing material, and a coating of bituminous material on at least one side of the saturated sheet, said coating being provided with a plurality of intersecting ribs integral with the coating and reinforcing the same, said ribs being less than 1″ apart.

8. As an article of manufacture, a sheet of roofing material having a layer of coating material thereon, said layer having a plurality of elevated portions of predetermined dimensions spaced less than 1″ apart, all of the edges of said portions having substantially the same depth.

9. A sheet of bituminous coated composition roofing on which at least one side has a pattern in said coating comprising predetermined, raised and depressed areas, the lines bounding the individual areas being not more than 1″ apart.

10. A sheet of roofing material comprising a foundation sheet coated on at least one side with waterproofing material, the exposed surface coating of which has raised and depressed portions predetermined as to size and location, said raised portions being less than 1″ apart.

11. A sheet of roofing material comprising a foundation sheet coated on at least one side with waterproofing material, the exposed surface coating of which has regularly disposed ribs thereon whose centers are substantially ⅛″ apart.

In testimony whereof I affix my signature.

RAY P. PERRY.