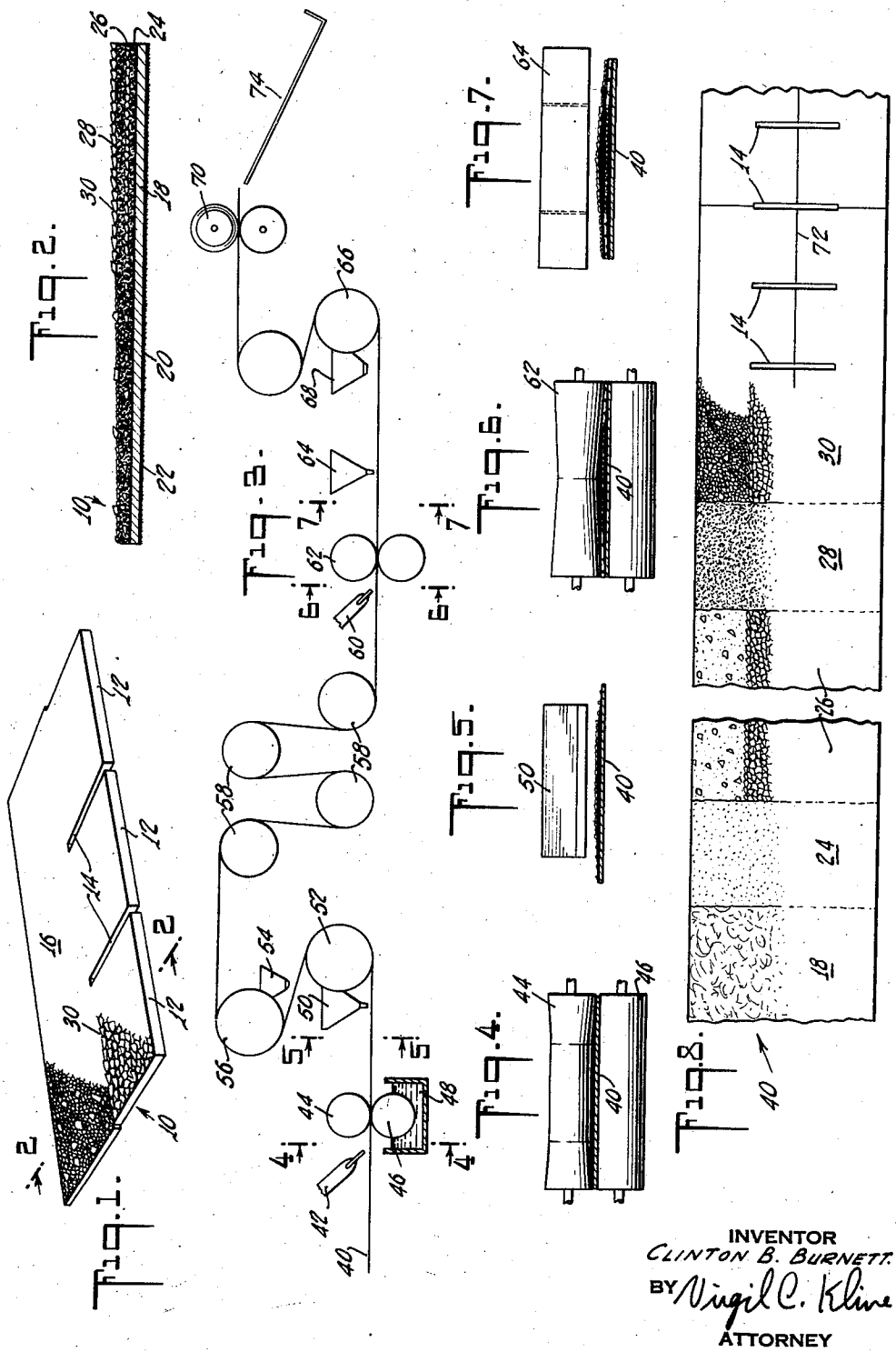
April 25, 1944. C. B. BURNETT 2,347,250

SHINGLE AND METHOD OF MAKING THE SAME

Filed March 19, 1941



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Published by AsbestosClaims.Law
asbestosclaims.law/library/23651/1

Patented Apr. 25, 1944

2,347,250

UNITED STATES PATENT OFFICE

2,347,250

SHINGLE AND METHOD OF MAKING THE SAME

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Application March 19, 1941, Serial No. 384,063

8 Claims. (Cl. 117—30)

The instant invention relates to covering units, and particularly to individual or strip shingles of the type cut from a continuous sheet or web, impregnated with a waterproofing material such as asphalt, coated with asphalt, or the like, and surfaced with a granular mineral material.

Heretofore, it has been known in the art to prepare such shingles from an asphalt-impregnated felt. According to the more conventional methods, the impregnated felt is supplied with a uniform coating of asphalt in which is partially embedded a surfacing of a comminuted mineral, such as crushed slate, or the like, and individual shingles or strip shingles are cut therefrom. In the manufacture of shingles of the so-called "thick butt" type, a second asphalt coating and comminuted mineral layer are applied to overlie that portion of the web to constitute the butt or exposure portions of the shingles. In the conventional strip shingle, in which the individual shingle-simulating tabs are defined by slots extending inwardly from the butt edge to a point slightly above the upper limits of the exposure area, the second coating and surfacing layer usually terminate on a line substantially coincident with the upper ends of said slots. Such thick butt shingles have been preferred over those with a single coating and surfacing layer due to the increased weight and durability of the butt portions and also the thicker butt line presenting a more pleasing appearance. However, although these shingles have enjoyed wide commercial usage, they have not sufficiently met the requirements of the art by reason of the inherent disadvantages arising from the termination of the overlay coating at a line substantially defining the upper limits of the exposure area. For example, the two-level characteristic of such shingles has no counterpart in wooden shingles. Furthermore, the termination of the reinforcing overlay along the line upon which the shingle tends to bend when its butt portion is subjected to lifting forces such as high winds, reduces its resistance to such lifting through what is, in effect, the hinge condition between the upper portion and the butt portion of the shingle.

The principal object of the instant invention is the provision of a shingle which will have a thick butt appearance, but which will be reduced in thickness more uniformly from the butt edge to the upper edge of the headlap area, and which will otherwise overcome the disadvantages of the present commercial shingle.

Another object of the invention is the provision of a shingle of the type referred to which will have the desired weight distribution to place the major weight of the shingle in the butt portion to inhibit lifting of the butt.

A further object of the invention is the provision of a method of making an improved shingle of the type referred to involving relatively inexpensive operations.

Briefly stated, the foregoing objects are attained by the improved shingle of the instant invention, comprising a first coating of any suitable or conventional bituminous material, such as asphalt, carrying a continuous surfacing of granular material on the butt portion and a minor amount or discontinuous layer on the granular material on the remaining portion. A second coating of asphalt overlies the entire upper face of the shingle. A granular material predominantly of a given size is partially embedded in the second coating over the butt portion of the shingle, and a granular material predominantly of a smaller size is partially embedded in the second coating on the headlap area, the two, however, blending to avoid an abrupt juncture line. Also, the shingle in the preferred form has a substantial taper from a maximum thickness at the butt edge to the upper edge of the headlap area, the taper resulting from the arrangement of coating and surfacing layers.

The invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description thereof which is to follow and to the accompanying drawing, in which:

Fig. 1 is a perspective view of a strip shingle in accordance with the instant invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a diagrammatic view illustrating the method employed in the instant invention;

Fig. 4 is a diagrammatic sectional view taken on the line 4—4 of Fig. 3 in the direction indicated by the arrows;

Fig. 5 is a diagrammatic sectional view taken on the line 5—5 of Fig. 3 in the direction indicated by the arrows;

Fig. 6 is a diagrammatic sectional view taken on the line 6—6 of Fig. 3 in the direction indicated by the arrows;

Fig. 7 is a diagrammatic sectional view taken on the line 7—7 of Fig. 3 in the direction indicated by the arrows; and

Fig. 8 is a plan view of a roofing sheet or web depicting the arrangement of the coating and

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surfacing materials in the several stages of the method of the instant invention.

Referring now to the drawing, and more particularly to Figs. 1 and 2, there is shown a covering unit 10, depicted for the purposes of illustration as a strip shingle, having a plurality of shingle-simulating tabs 12 defined by slots 14 and a headlap area 16 to be overlapped by a shingle of a next higher course when the shingle is applied. It will be understood, however, that the invention may equally well be embodied in an individual shingle, a shingle with hexagonal tabs, or any other conventional shingle shape.

Shingle 10 comprises a base 18, which, in accordance with conventional practice, may be an asbestos felt, rag felt, or the like, impregnated with any of the known waterproofing materials used for this purpose, such, for example, as a relatively low melt point asphalt. The under surface of the base carries a relatively thin coating 20 of a waterproofing material, suitably asphalt, in which is embedded talc particles, or the like, 22, which serve to prevent adhesion of the shingle to an underlying shingle in the shingle bundle.

In accordance with the instant invention, the upper surface of base 18 carries a coating layer 24 which is relatively thick over that portion of the shingle to be exposed during use and relatively thin over the headlap area of the shingle, as shown particularly in Fig. 2. Coating 24 is suitably a relatively high melt point asphalt, or other bituminous material conventionally used for coating purposes. The coating layer may be of substantially uniform thickness over the part of the shingle to be exposed (hereinafter referred to as the "butt" area), and likewise, of a substantially uniform but lesser thickness over the remaining area of the shingle (hereinafter referred to as the "headlap" area). However, it is preferred that the coating on the headlap area taper from the upper edge of the butt area to the upper edge of the headlap area. Embedded in coating 24 over the butt area is a substantially continuous layer of a granular material 26, such as scrap crushed slate, mastic sand, mineral wool shot, and the like, or a mixture thereof. The granular material 26 extends to some extent onto the coating covering the headlap area to form a discontinuous layer sufficient to prevent sticking of the shingle to various parts of the apparatus during the manufacturing operations.

Overlying the coated and slated shingle surface is a second coating layer 28, preferably of a high melt point asphalt similar to that employed for the first coating layer. The upper surface of layer 28 suitably tapers with respect to base sheet 18 at least over the headlap area so that the shingle has its thinnest portion at the upper edge of the headlap area. Preferably, such taper extends substantially uniformly throughout from a maximum thickness at the butt edge to the upper edge of the headlap area. Partially embedded in the second coating layer 28 is a surfacing layer 30. Over the butt portion of the shingle the surfacing layer is formed of mineral granules, such as crushed slate, or the like, predominantly of the size conventionally used on the exposure areas of shingles of this general type. Thus, for example, #11 granules may be used. Surfacing layer 30 on the headlap is predominantly composed of granules of a smaller size, but has intermixed with such smaller granules a minor proportion of the granules used on the butt area to submerge the line of jointure between the two areas. The predominant granules on the headlap area may, for example, be #20 granules and may or may not differ in color with respect to the granules on the butt, depending upon the effect desired.

A shingle in accordance with the invention as described above does not exhibit any definite shoulder between the butt and headlap areas and at least gives the appearance of substantial uniformity of taper from the butt edge to the upper edge. Furthermore, the greatest weight of the shingle per unit of area is in the butt, whereby the shingle tabs are not susceptible to ready lifting under the action of high winds.

Referring now particularly to Figs. 3 to 8, inclusive, the manufacture of the shingles of the invention will be described. A web of felt, or the like, as conventionally employed in "asphalt roofing," and saturated with a suitable waterproofing compound, such as low melt point asphalt, or the like, is indicated at 40. Web 40 is suitably of a width to permit a plurality of lanes of shingles to be cut therefrom. For purposes of example, the web is shown to be of a width to accommodate two lanes of strip shingles, with the lengths of the strips extending longitudinally of the web. The web, moving in the direction indicated by the arrow, passes first beneath a spout 42, or other suitable means to deliver coating asphalt thereon and then beneath a coating or spreading roll 44. Roll 44 is suitably shaped to distribute the coating in a relatively thick layer over the center portion of the web, which is to constitute the butts of the shingles, and a relatively thin layer over the margins of the web, which are to constitute the shingle headlap areas. As illustrated particularly in Fig. 4, preferably roll 44 is shaped to taper the coating on the marginal edges of the web from a maximum depth equal to that on the butt portions to a minimum depth at the web edges. A coating roll 46 is located beneath the web and is supplied with coating material, for example, through rotation in coating-filled chamber 48. The roll transfers a thin layer of coating to the under surface of the web.

After receiving the coating the web passes beneath a hopper 50 having a discharge slot extending across the central portion of the web a sufficient distance to discharge granular material contained in the hopper onto the coating of the butt lanes to provide a substantially uniform layer thereon, with an excess overflowing to some extent onto the coating of the headlap lanes to provide a discontinuous fragmentary layer of granular material on the latter portions of the coated web. The web then passes around an embedding roll 52, whereby the applied granular material is partially embedded in the coating. The coating on the under side of the web is covered with a back surfacing, such as talc, discharged from a hopper 54. The talc is partially embedded in the under coating as the web passes around roll 56, and the coating layers are then permitted to set and harden as the web travels around cooling rolls 58 or through a cooling looper, or the like.

Web 40 then passes to a second coating applicator, comprising, for example, a coating spout 60 discharging a suitable coating material on the upper surface of the web, and roll 62 shaped (see Fig. 6) to distribute the coating so that the greater weight of the same is on the butt lanes of the web and the lesser proportion on the headlap lanes. As illustrated, preferably such distri-

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bution includes a tapering of the coating from the center line of the web substantially uniformly to both its outside edges. The web then passes beneath another hopper, or series of hoppers, 64, containing the surfacing granular material and suitably divided, or otherwise arranged as indicated diagrammatically in Fig. 7, to discharge granules of a given size onto the butt lanes and granules of predominantly a smaller size onto the headlap lanes. Mixed in with the granules of smaller size is a small proportion, say, 10% or less of the headlap granules. The granules are partially embedded in the second coating as the web passes around an embedding roll 66, and excess granules are collected in trough 68. The mixture of granules for the headlap areas is suitably obtained by including a desired proportion of the granules collected in trough 68 with the supply of smaller size granules.

Web 40 is then carried to cutting roll 60, suitably constructed in accordance with conventional practice to cut out slots 14 and to longitudinally slit the sheet into two individual shingle lanes, as indicated at 72 in Fig. 8. The plurality of lanes are divided into individual shingles by suitable cutters, preferably carried by roll 70, all in accordance with conventional practice, and the shingles are discharged onto a collecting device, as indicated diagrammatically at 74.

As will be understood by those skilled in the art, the apparatus described above, in explaining the method, is only representative of that which may be employed and any of the conventional means may be substituted to carry out the individual steps. Also, having thus described the invention in rather full detail, it will be understood that these details need not be strictly adhered to, but that various changes and modifications will suggest themselves, all falling within the scope of the invention as defined by the subjoined claims.

What is claimed is:

1. A covering unit comprising a base impregnated with a waterproofing material, a surface of said unit carrying a bituminous coating layer, said layer being of greater but substantially uniform thickness over a portion of the unit substantially that to be exposed, a substantially continuous layer of granular material partially embedded in the coating on said portion, said granular material extending to and forming a discontinuous layer on the remaining area of said surface, a second bituminous coating layer covering said surface of the unit and a granular material predominantly of a given size partially embedded in said second coating on said portion, and granular material predominantly of a smaller size partially embedded in the second coating over the remaining area of said surface.

2. A covering unit comprising a base impregnated with a waterproofing material, a surface of said unit carrying a bituminous coating layer thereon, said layer being of greater but substantially uniform thickness over a portion of the unit substantially that to be exposed and of lesser thickness over the remaining area, a substantially continuous layer of granular material partially embedded on said portion and extending to and forming a discontinuous layer on said remaining area, a second bituminous coating layer covering said surface of the unit and including an upper surface tapering with respect to said base from the butt edge to the upper edge of the unit, and granular material partially embedded in said second coating.

3. A covering unit comprising a base impregnated with a waterproofing material, a surface of said unit carrying a bituminous coating layer thereon, said layer being of greater but substantially uniform thickness over a portion of the unit substantially that to be exposed and tapering therefrom to the upper edge of the unit, a substantially continuous layer of granular material partially embedded in the coating on said portion and extended to form a discontinuous layer on the remaining coated area, a second bituminous coating layer covering said surface of the unit and tapering with respect to the base from the butt edge to the upper edge of the unit, granular material predominantly of a given size partially embedded in said second coating on said portion, and granular material predominantly of a smaller size partially embedded in the remaining area of said second coating, a minor proportion of said granular material of a given size being intermixed with the granular material on said remaining area.

4. A strip shingle comprising an asphalt-saturated felt base having a plurality of slots extending inwardly from the butt edge thereof to define shingle-simulating tabs, an asphalt coating layer on the upper face of said base, said layer being of greater but substantially uniform thickness over that portion of the base defined by the butt edge of said tabs and a line adjacent the upper ends of said slots, a layer of asphalt coating of lesser thickness covering the remaining area of said face, a substantially continuous layer of granular material partially embedded in the coating on said portion and extending to and forming a discontinuous layer on the remaining area of said face, a second layer of asphalt coating covering said face of the unit, and granular surfacing material partially embedded in said second coating.

5. A strip shingle comprising an asphalt-saturated felt base having a plurality of slots extending inwardly from the butt edge thereof to define shingle-simulating tabs, an asphalt coating layer on the upper face of said base, said layer being of greater but substantially uniform thickness over that portion of the base defined by the butt edge of said tabs and a line adjacent the upper ends of said slots, a layer of asphalt coating of lesser thickness covering the remaining area of said face, a substantially continuous layer of granular material partially embedded in the coating on said portion and extended to and forming a discontinuous layer on said remaining area, a second layer of asphalt coating covering said face of the unit, the upper surface of said second coating tapering with respect to the shingle base from a maximum thickness at the butt edge of said shingle to a minimum thickness at the upper edge thereof, and granular surfacing material partially embedded in said second coating.

6. A method of making covering units comprising applying to the surface of a saturated web of a width to have severed therefrom one or more lanes of covering units, a layer of a plastic, bituminous coating material of a greater but substantially uniform thickness on that portion of the web to constitute the exposed portions of the covering units and a lesser thickness on the remaining area of said web, showering granular material on the coating of greater thickness to form a substantially continuous layer while permitting said granular material to overflow to form a discontinuous layer on the remainder of the coating, partially embedding said granular

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material in said coating, applying a second layer of bituminous coating to overlie the entire surface of said web, partially embedding in said second coating a second layer of granular material, and severing covering units from said web.

7. A method of making covering units comprising applying to the surface of a saturated web of a width to have severed therefrom one or more lanes of covering units, a layer of plastic, bituminous coating material of greater but substantially uniform thickness on that portion of the web to constitute the exposed portions of the covering units and of tapering thickness on the remaining areas of the web, showering granular material on the coating of greater thickness to form a substantially continuous layer thereon and a discontinuous layer on the remainder of the coating, partially embedding said granular material in said coating, applying a second layer of bituminous coating to overlie the surface of said web, showering a granular material predominantly of a given size on the coating overlying said portion and predominantly of a smaller size on the coating overlying said remaining areas, partially embedding said granular material in said second coating, and severing covering units from said web.

8. A method of making strip shingles comprising applying to the surface of an asphalt-saturated felt web of a width to have severed therefrom one or more lanes of strip shingles extending longitudinally of the web, a layer of a plastic asphalt coating of a greater but substantially uniform thickness on that portion of the web to constitute the butt portions of the strip shingles and of a tapering thickness on that portion of the web to constitute the headlap areas of such strip shingles, showering a granular material on the coating of greater thickness to form a substantially continuous layer while permitting said granular material to overflow to form a discontinuous layer on the remaining area of the coating, partially embedding said granular material in said coating, applying a second layer of asphalt coating to cover the entire surface of said web in such a manner that the upper surface of said second coating tapers with respect to the face of said web from a line defining the butt edges of said strip shingles to a line defining the upper edge of the headlap areas thereof, showering granular material predominantly of a given size on said second coating covering said exposure areas and predominantly of a smaller size on the remaining area of said coating, partially embedding said granular material in said coating, slotting and slitting said web, and severing strip shingles therefrom.

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CERTIFICATE OF CORRECTION.

Patent No. 2,347,250. April 25, 1944.

CLINTON B. BURNETT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 45, for "condition" read --connection--; and second column, line 14, for "on" first occurrence, read --of--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of June, A. D. 1944.

Leslie Frazer

Acting Commissioner or Patents.

(Seal)

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