

Sept. 3, 1935.

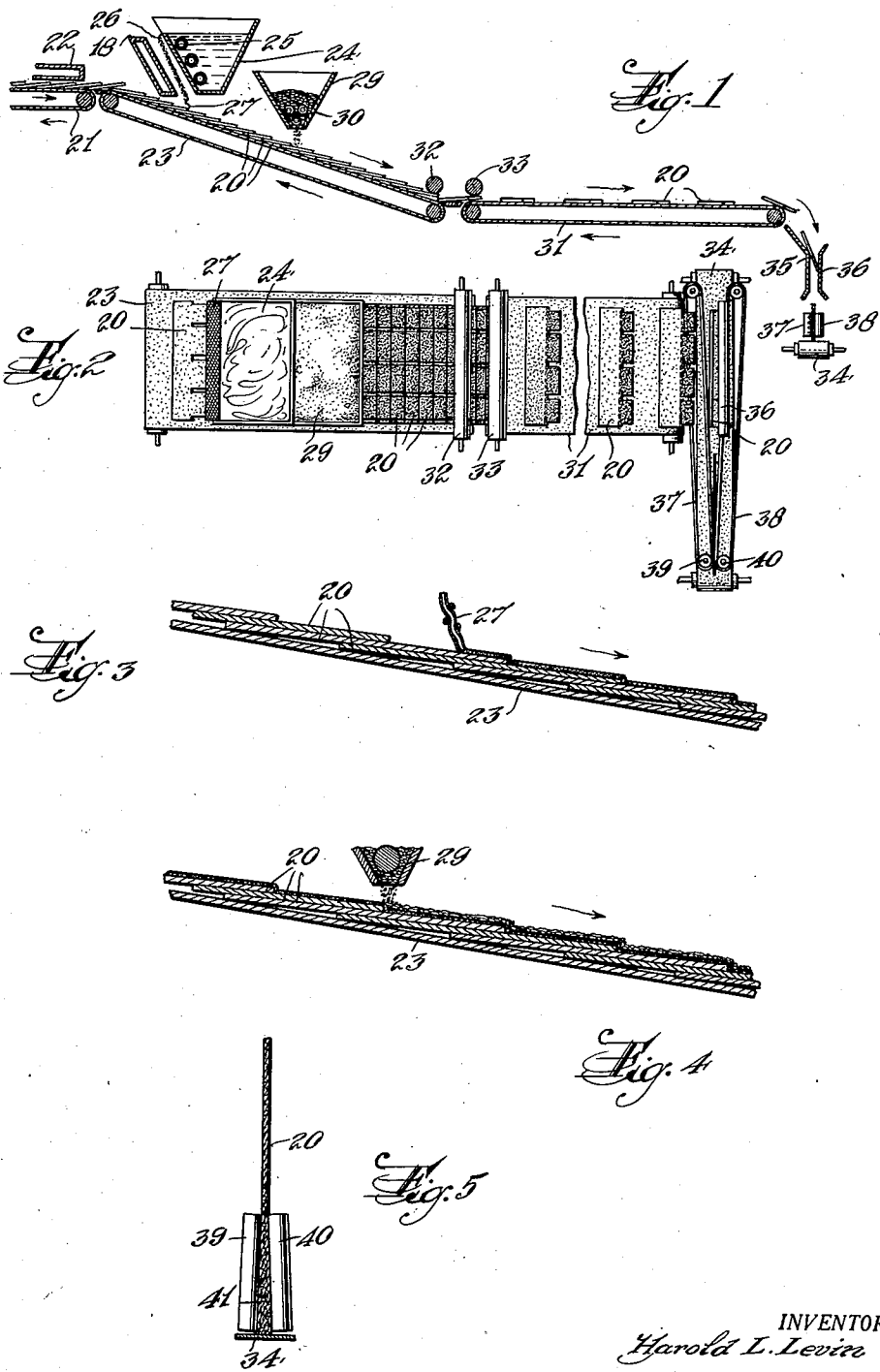
H. L. LEVIN

2,013,352

SHINGLE ELEMENT

Filed Oct. 12, 1931

3 Sheets-Sheet 1



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Sept. 3, 1935.

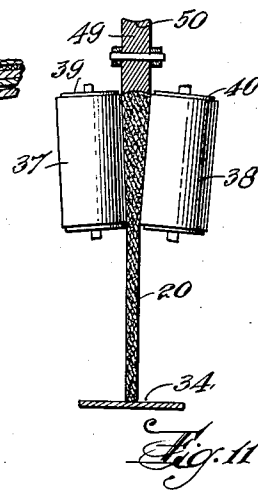
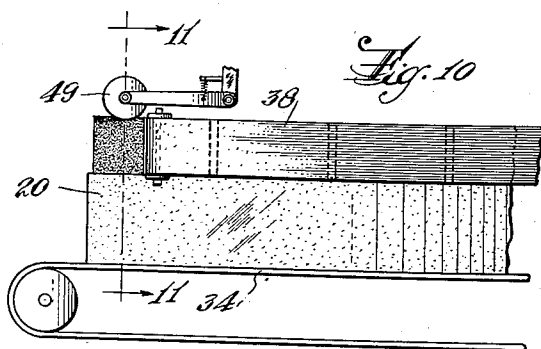
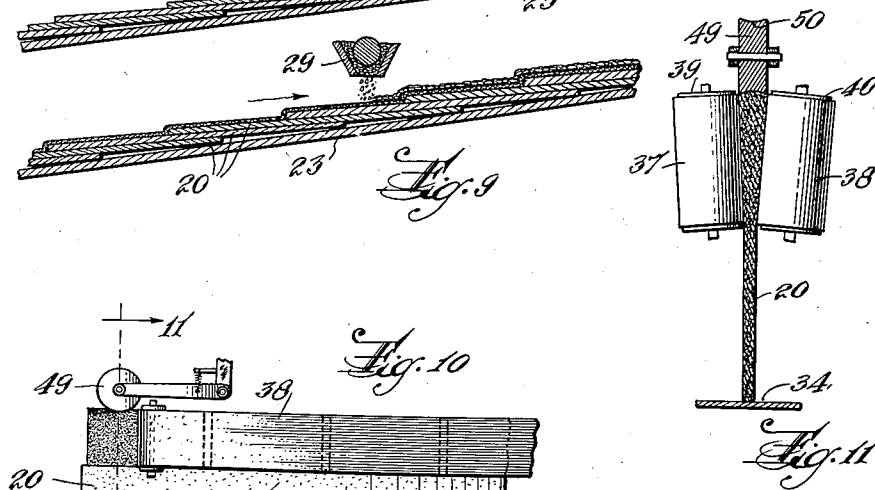
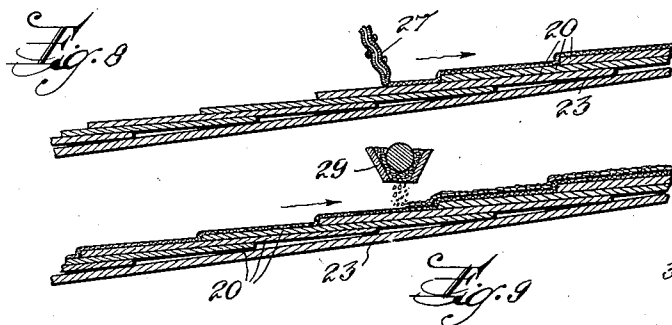
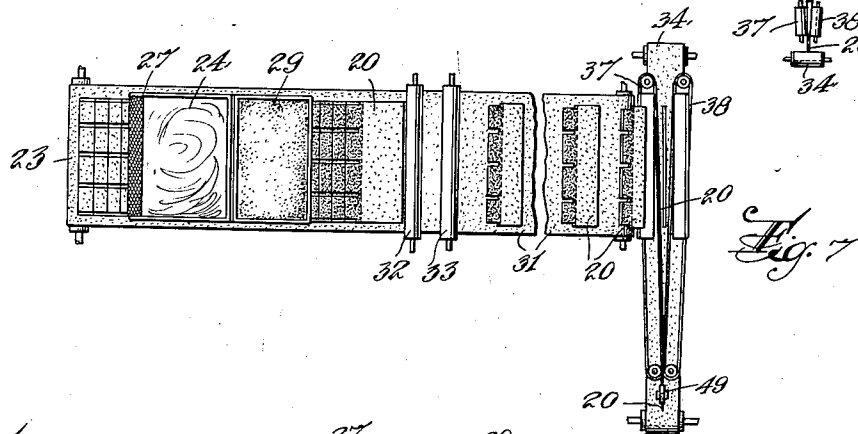
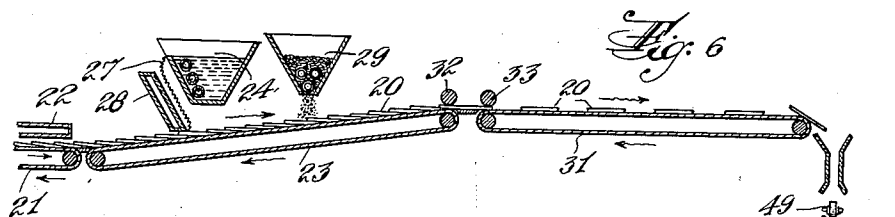
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3 Sheets-Sheet 2



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Fig. 12

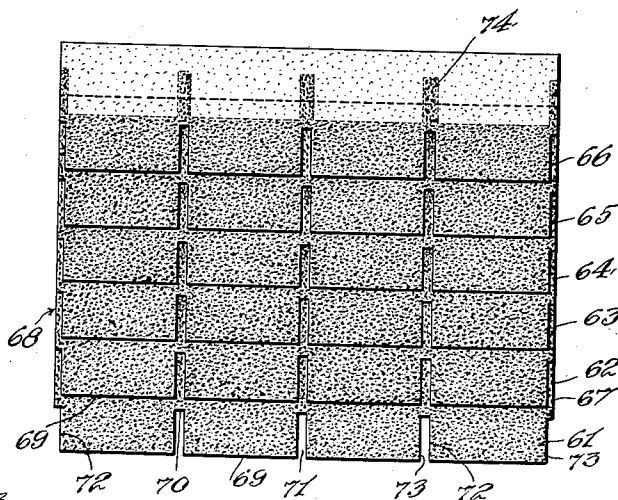


Fig. 13

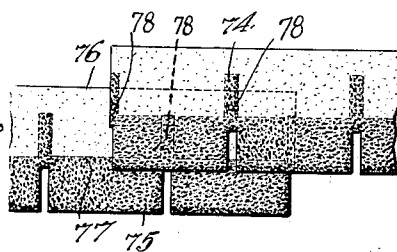
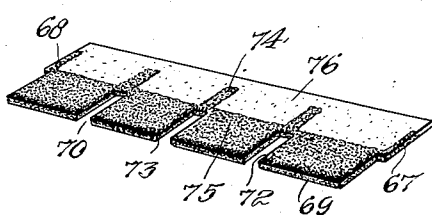


Fig. 14

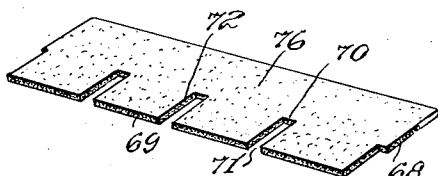


Fig. 15

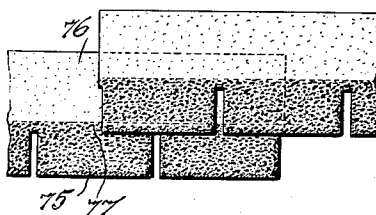


Fig. 16

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UNITED STATES PATENT OFFICE

2,013,352

SHINGLE ELEMENT

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4 Claims. (Cl. 108—7)

This invention relates to thick butt fabricated roofing elements which are characterized by having the butt portion, which is exposed to the weather when laid, completely covered both on its exposed face and edges with a continuous coating of asphalt preferably masked by a surfacing layer of grit or its equivalent. Roofing elements of this type are customarily made of material comprising a felted fibrous base which is comparatively bibulous. This felted material in sheet form is thoroughly saturated with waterproofing material such as low melting-point asphalt. The saturated sheet is thereupon coated on both sides with a layer of relatively high melting-point oxidized asphalt which is particularly suited for weather-proofing the roofing material and preventing the access of moisture to the fibers of the saturated base. In order to protect the exposed coating of asphalt which is liable to deterioration by effects of the weather, such as rays of the sun, which tend to polymerize the asphalt and render it brittle and subject to cracking, a surfacing layer of comminuted mineral matter is applied to the coating on one or both sides of the sheet to mask and protect the coating from effects of the weather. The finishing layer of mineral matter also performs other useful functions such as adding to the decorative effect of the roofing unit and weighting the exposed portions to counteract tendencies to curl or to be lifted by the action of wind. From sheet roofing material thus prepared, the roofing elements are customarily cut out in any desired shapes and are packaged as a finished article for shipment and subsequent use. Such elements, however, have objectionable features in that the cut edges along the butt of the element expose cut ends of fibers to the weather. These cut ends being unprotected have been found to absorb moisture in wet weather and to permit the access of oxygen to the thin films of asphalt with which the fibers of the base are coated. As a result of changes of moisture content and exposure to air, the asphalt-saturated base swells or bulks, and the asphalt becomes oxidized and polymerized, resulting eventually in a breaking off of portions of the coating asphalt and mineral surfacing. The rate of such deterioration increases progressively inasmuch as the further it goes, the more exposed is the roofing element to the deteriorating effects of the weather.

Another objectionable feature to roofing elements cut from a sheet of roofing material made as described above is that such material is comparatively thin and when elements cut there-

from are laid upon a roof, the roof as a whole presents a flat and unsubstantial appearance, which is not in keeping with such buildings as residences of the better kind. Hence discriminating architects have largely avoided the ordinary asphalt roofing elements in the construction of the better class of residences on account of the unfavorable appearance often presented thereby.

In order to overcome the objections to the ordinary roofing elements cut from asphalt coated sheet material, it has been found that if such elements are provided with an additional coating of asphalt over the portion of the element which is exposed to the weather when laid, including the butt and side edges, such an additional coating serves both to seal the edges which were previously a vulnerable point of the element, and also to thicken the visible portion of the element in such a way as to give a roof upon which such elements are laid a substantial appearance. In my issued Patent No. 1,781,877, dated November 18, 1930, I have described and claimed a method of and means for applying such an additional coating of asphalt to pre-cut roofing elements which have been made as described above, and applying an additional surface layer of comminuted mineral matter, such as crushed slate or the like, to the protective asphalt coating thus applied. The present application is directed to the products produced in accordance with the disclosure of said patent.

To carry out my invention, I have devised apparatus for applying in a novel way to roofing elements cut to shape from finished sheet roofing material, an additional coating of molten asphalt over the face and edges of the elements which will be exposed to the weather when laid, surfacing the additional coat with a layer of comminuted mineral material, and operating on the elements thus treated to press the mineral particles into firm engagement with the asphalt coating and at the same time to shape the thickened butt portion of the shingle as desired.

To produce my novel product, I arrange pre-cut roofing elements in a continuous overlapping series, in which each element is partly overlaid by other adjacent elements in the series. Preferably the unlapped portion of each element will be substantially the same as the portion of the element which will be exposed to the weather when the element is laid with others on a roof. Upon the unlapped face portions and edges of the elements in the series is applied a continuous coating of suitable waterproofing material such as certain asphalts commonly used for coat-

ing purposes. Grit or the like may be applied to the coating while still hot and sticky, and the elements are separated before the coating sets or hardens.

5 This method of applying coating to elements in lapped series may be used to build up butt portions of extra thickness tapering off toward the head. This may be done by arranging the elements so that only a small part of the butt
10 portion of each is unlapped in the series. After these have been coated, with or without the addition of grit the elements may be separated further and a second coating applied. This may be repeated until the whole portion of each element
15 which will be exposed to the weather when laid is coated whereupon the elements are separated and further treated as hereinafter described. This results in an element having a number of extra coatings at the butt edge extending toward
20 the head, each such coating except the top one being overlaid by a coating extending further toward the head of the element.

Various advantageous features of the invention will be apparent to one skilled in the art
25 from the disclosure of the invention in the following description and on the drawings of which—

Figure 1 represents diagrammatically a side elevation of an embodiment of my invention;

30 Figure 2 is a plan view of the same;

Figures 3 and 4 are detail views of a portion of Figure 1, shown on a larger scale;

Figure 5 illustrates the action of certain elements on the butt portion of the roofing elements;

Figure 6 is a diagrammatic side elevation of a modified form of apparatus;

Figure 7 is a plan view of the same;

Figures 8 and 9 are detail views of portions of Figure 6, shown on a larger scale;

40 Figure 10 is a side elevation of a portion of the mechanism illustrated in Figure 7;

Figure 11 is a section taken on the line 11—11 of Figure 10;

45 Figure 12 is an enlarged plan view showing the appearance of the elements after they have been coated and surfaced in accordance with the invention, but before being separated;

Figures 13 and 15 are perspective views of the upper and lower faces, respectively, of a finished element;

Figures 14 and 16 are plan views of elements produced in accordance with the invention as they appear when laid in successive courses on a roof.

55 Referring to Figure 1, a series of roofing elements 20 are fed to the mechanism as on a conveyor 21. The elements are placed on this conveyor in an overlapping relation either by hand or by any suitable mechanism (not shown). Preferably, although not necessarily, the elements may be pre-heated before being so arranged and/or the unlapped surfaces may be heated after the elements have been arranged in overlapping series as by a steam box 22, a blast of hot air or any other suitable and convenient means. From the conveyor 21, the series of elements may be transferred to another conveyor without altering their relative relation. Inas-
60 much as roofing elements of the common asphaltic type are somewhat flexible and have a rough surface due to the surfacing layer of grit, the relative relation between successive elements placed in an overlapping relation as shown will
75 not easily be disturbed except by positive means

operating for that purpose. As indicated in Figures 3 and 4, the elements 20 are overlapped upon each other in such a way that each element by approximately the same amount and at substantially the same portions thereof as the element
5 will be overlaid when in place on a roof, so that the uncovered portion as shown in Figures 3 and 4 represents substantially the portion to be exposed to the weather when the element is laid on a roof. In this form of the apparatus, the
10 elements are shown as being advanced butt edge first, each element being partly overlaid by elements following it. The conveyor 23 which receives the series of elements may be disposed horizontally if desired, but as shown on the drawing it is inclined downwardly (the angle of inclination being somewhat exaggerated on the
15 drawing for the purpose of illustration) and passes beneath suitable means for applying to the succession of elements carried by the conveyor heated asphalt in sufficient quantity to coat completely the exposed surfaces and edges of the elements with a continuous film of asphalt and means for showering the freshly coated surfaces with comminuted mineral such as crushed
20 slate or the like. In order to apply an even coating to the exposed surfaces of the elements, I may provide a suitable receptacle 24 for molten asphalt, this receptacle having therein heating units 25 if desired. One side edge of the receptacle 24 is preferably cut lower as at 26 than the other edges, a feeding guide 27 being secured thereto in order to feed a sheet of molten asphalt from the receptacle 24 down to close proximity to the surfaces to be coated, this guiding means
25 27 being used to prevent the sheet from breaking up into dribbles under the action of surface tension, and thus to insure an even application of the asphalt under the entire exposed surfaces of the elements. The guide 27 may be of any preferred construction. As shown, it comprises a piece of wire netting having meshes of suitable size, the netting serving to hold the flowing asphalt in a continuous sheet. In order to prevent premature cooling of the asphalt as it
30 flows along the guide 27 in a thin sheet, a steam box 18 or other heating means may be provided in juxtaposition thereto, this heating means being available to regulate the temperature and hence the viscosity of the asphalt at the moment it is deposited on the elements 20. Immediately following the asphalt container 24 may be located a suitable hopper 29 from which a shower of grit or other comminuted material may be continuously deposited upon the freshly applied
35 coating of asphalt by mechanism well known in the art. If desired, such surfacing material may be heated as by suitable units 30 placed within the hopper to insure firmer engagement of the grit particles with the asphalt. The elements thus coated and surfaced on the conveyor 23 may then be separated and transferred to another conveyor 31. In order to separate the elements, I may provide a roll 32 adjacent to the delivery end of the conveyor 23, the roll 32 being
40 resiliently supported to press on the successive elements. This roll is preferably driven at a peripheral speed equal to that of the conveyor 23. Another roll 33 may be yieldingly supported to engage the elements at a point adjacent to the receiving end of the conveyor 31, this roll and the conveyor 31 being preferably driven at an equal peripheral speed greater than that of the roll 32 and the conveyor 23. The rolls 32 and 33 may be so spaced that when the butt edge
45 50 55 60 65 70 75

of a roofing element enters the nip between the roll 33 and the conveyor 31, the upper or head edge of that element will have cleared the roll 32. The next following element, however, which 5 overlies the element entering the nip of the roll 33 is at this point still between the slower moving roll 32 and conveyor 23, so that the faster feeding action of the roll 33 and conveyor 21 pulls the element entering the nip between them away 10 from the series on the conveyor 23 and thus spaces them as indicated in Figure 1. The rolls 32 and 33 in addition to separating the successive elements also serve to press the grit lying on the fresh coating on the faces of the elements into more intimate embedded contact with the asphalt. The elements on the conveyor 31 may 15 then be discharged edgewise one after the other to a suitable conveyor 34, guiding plates 35, 36 being provided as desired for insuring the proper upright positioning of each element on the conveyor 34. Suitable means may be provided for 20 shaping and finishing the additional coating and surfacing layers which have been applied to the face and edges of the butt portion of the elements. Such apparatus may be as illustrated in Figures 1 and 2, and may comprise a pair of 25 vertically arranged endless belts 37, 38 between which the elements are deposited from the conveyor 31. These belts 37, 38 are preferably arranged to converge so that at their delivery end, the butt portion of each element is pressed between their opposing faces as they pass between the rolls 39, 40 which are preferably yieldingly 30 mounted and adjustable both as to axial direction and distance apart. At the same time, the weight of the element on the conveyor 34 serves to press the grit adhering to the butt edges of the element into more intimate contact with the coating on the edges. If desired, the axes of 35 the rolls 39, 40 may be inclined toward each other slightly so that the pressing faces of the belts 37, 38 which pass between them will also converge upwardly. This tends to impart a taper to the thickened butt portion of the roofing element as indicated at 41 in Figure 5.

45 A modified form of the apparatus as a whole is illustrated in Figures 6 to 11. According to this embodiment of the invention, the conveyor 21 feeds to the conveyor 23 a series of roofing elements overlapped in the opposite direction to that shown in Figure 1, that is, the elements are fed 50 head first instead of butt first, with the head portions thereof overlapped by the next element ahead, rather than by the next following. In this case, I prefer to slope the conveyor 23 upwardly so that the asphalt when applied as illustrated in Figure 8 will tend to flow toward the butt 55 edges of each element. It is obvious, however, that if desired, the conveyor 23 may be level either in the form of apparatus shown in Figure 1 or that shown in Figure 6. The coating device in the apparatus illustrated in Figure 6 may be identical with that illustrated in Figure 1, including the guide 27 and a steam box 28 as described 60 above with reference to Figure 1. The grit-applying device 29 may also be the same, as well as the rolls 32 and 33 which separate the overlapped shingles from one another. The separated shingles are discharged head first on a conveyor 34 which carries them off at right angles to their 65 motion on the conveyors 23 and 31, as shown in Figure 7. Since in this case the butt portions of the elements are uppermost as the shingles are conveyed edgewise on the conveyor 34, the belts 70 37, 38 and the rolls 39, 40 about which the belts

pass are elevated sufficiently to engage the butt portions of the elements passing therebeneath. As indicated in Figure 11, the axes of the rolls 39, 40 may be inclined so as to diverge upwardly and 5 to tend to taper the thickened butt portions of the elements which pass between them. The butt edges of the elements may at the same time be shaped as desired. As indicated in Figures 10 and 11, a suitable roller 49 may be mounted to 10 press its edge against the butt edge of elements passing between the rolls 39, 40. As shown in Figure 11, the roll 49 may have a grooved edge 50 to round off the butt edge of the elements, but it is obvious that they may be shaped in any desirable way by shaping the edge of the roll 49 15 accordingly.

Referring to Figure 12, the elements 61, 62, 63, 64, 65 and 66 overlap each other so that the side edges 67, 68 are substantially coincident and the 20 lower edges 69 of the tabs of each element are spaced a small distance above the inner edges 70 of the cut-outs 71. In this manner the coating and surfacing will cover substantially the entire tab area together with a narrow band of the 25 body portion of the shingle contiguous to the tabs. The edges 69, as well as the edges 70, 72 and 73 of the cut-outs, will be coated and surfaced at the same time. It is apparent that coated and surfaced areas in the form of tongues 74 will be 30 formed in the body portion of the strip as extensions of the coating on the butt portions, these tongues being occasioned by the slots in the superjacent element of the overlapping series during the application of coating and surfacing material. 35

If it is desired to produce elements without these tongues, the cut-outs can be blocked off in any convenient manner, as by interposing suitable shields between adjacent elements in the series. 40

The finished elements will have the appearance shown in Figures 13 to 16. The tab defining portion 75 of each element will have its edges coated, sealed and surfaced and will be thicker than the major portion of the body 76. The lower face 45 of the element shown in Figure 15 may be surfaced with powdered mica or fine mesh granular material. As already shown in Figures 5 and 11, the butt portion may be tapered. It is obvious that the butt portion can be also formed of uniform thickness. The element is substantially 50 rectangular in shape having tab defining portions which are also substantially rectangular, extending from the lower edge of the body portion. The tabs are separated by narrow slots extending preferably less than half-way of the depth of the 55 shingle. The tongues 74 project into the body portion directly above the slots 71 separating the tabs. These tongues provide bulking areas for the superjacent shingle thereby tending to give an appearance of thickness thereto. They also provide strong points for nailing the shingles to the substructure, the nails being usually driven at points slightly above the slots, as indicated at 60 78 in Fig. 14.

The elements are laid in staggered overlapping relation so that the lower edges of the tabs of the strips in a superjacent course are coincident with the upper edges 70 of the cut-outs 71 of the strips in the subjacent course. 65

The blanks which are treated according to the method herein described may be individual or strip shingles having any desired number of tabs. The blanks may be cut from a felted fibrous sheet which has been saturated and coated or 75

saturated, coated and surfaced with wear-resistant granular material on either one or both faces. If only the upper face of the sheet is surfaced with wear-resistant granular material, the lower face will be dusted with mica or talc. Furthermore, the surfacing on the tabs may be of different color from that on the body portion and the tabs on each element may each be surfaced with different colored granules.

- 10 Having thus described certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications may be made therein without departing from its spirit or scope as defined by the appended claims.

15 I claim as my invention:

1. An asphalt saturated and coated fibrous base shingle strip having a body portion and substantially rectangular shaped tabs spaced from one another by tab-defining slots, an additional layer of coating and surfacing material on only the exposed surface and the exposed side and butt edges of said strip including narrow vertically elongated areas of the body portion extending upwardly from the upper extremities of said slots, said additional coating on the exposed face and edges being integral and continuous, the bottom of said strip being free of the additional layer of coating and surfacing material whereby it presents a flat surface and permits the saturation and coating of the strip to exude from the bottom thereof to adhere it to its supporting surface.

2. An asphalt saturated and coated fibrous base shingle having a body portion and tabs extending therefrom, the tabs being spaced by narrow notches, additional coating covering the exposed surface only of said tabs together with a narrow band of the body portion contiguous to

said tabs, an additional layer of coating on vertically elongated rectangular portions of the body directly above said notches, the exposed butt and side edges of said shingle being sealed with asphalt and the surfaces which have been additionally coated being surfaced with granular material, said shingle being free of the additional coating and surfacing material on its bottom whereby the bottom is flat and whereby the saturant and coating of the strip is permitted to exude downwardly from the bottom thereof to cause it to adhere to its supporting surface.

3. A roof covering composed of a plurality of overlapping staggered courses of asphalt saturated and coated fibrous base shingle strips, said strips having body portions and rectangular shaped tabs extending therefrom spaced by narrow cut-outs, said tabs being additionally coated on the exposed surface only and the exposed side and butt edges being sealed with a coat of asphalt which is integral and continuous with said additional face coat, additional asphalt coating on vertically extending portions of the body directly in line with the cut-outs of the strips, said vertically extending portions being integral and continuous with said additional face coat, and granular material covering said additionally coated surfaces and sealed edges, the bottom portion of said shingle being free of said additional coating of asphalt and granular material whereby it presents a flat surface and permits the asphalt content of the shingle to exude from the bottom thereof and adhere it to the supporting surface.

4. A roof covering according to claim 3 in which a narrow band of the body portion contiguous to the tabs is also additionally coated and surfaced.

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