Jan. 14, 1941. L. KIRSCHBRAUN 2,228,463

SHINGLE FOR ROOFING OR THE LIKE

Original Filed July 6, 1935 3 Sheets-Sheet 1

Fig. 1.

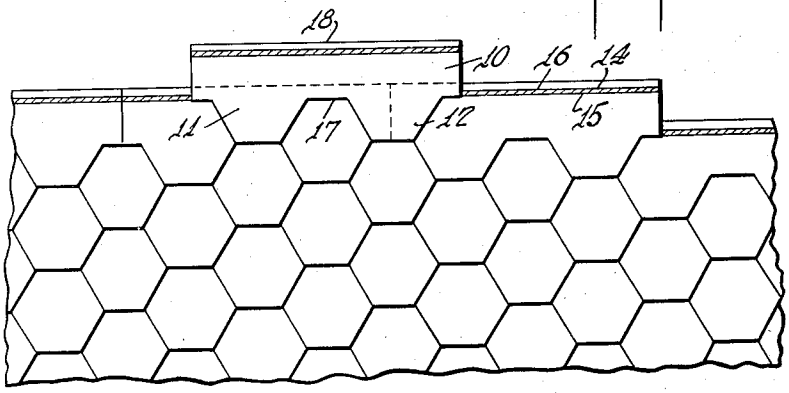


Fig. 2.

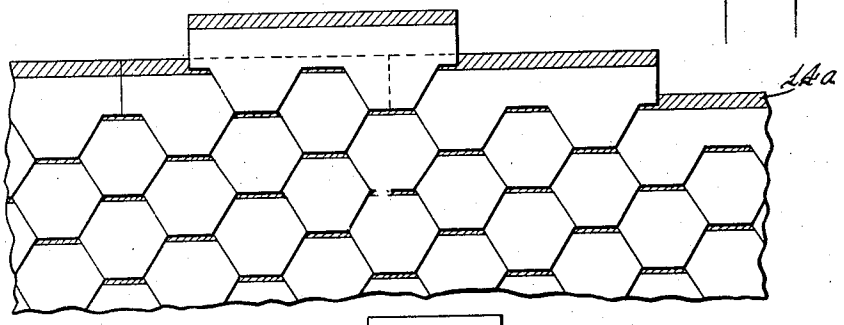
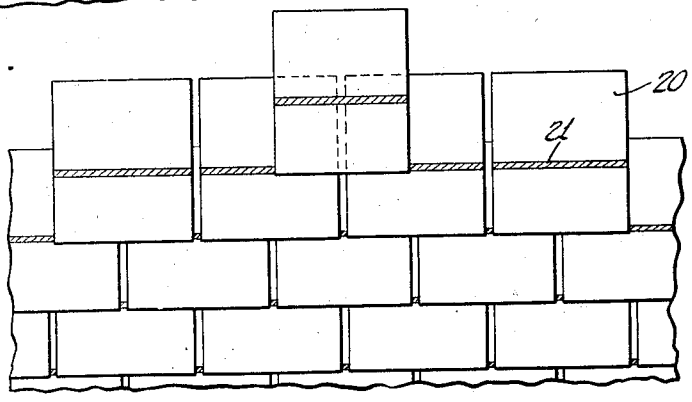


Fig. 3.



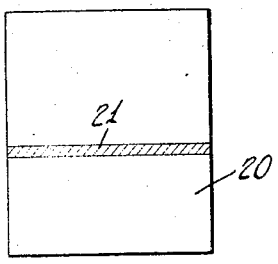


Fig. 4.

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Fig. 5.

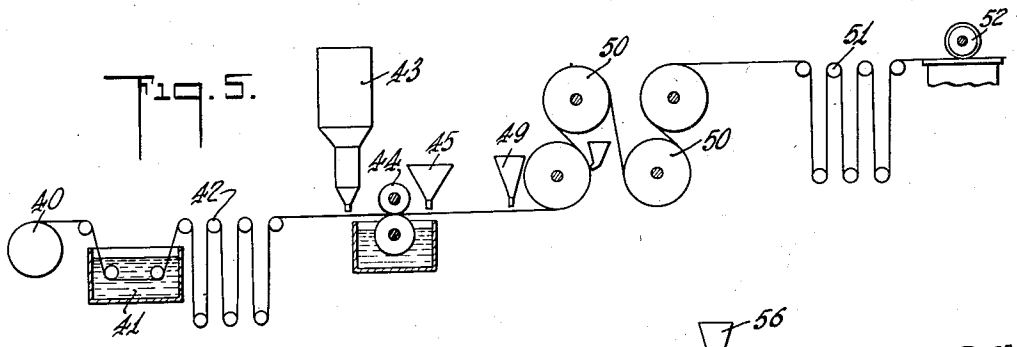


Fig. 6.

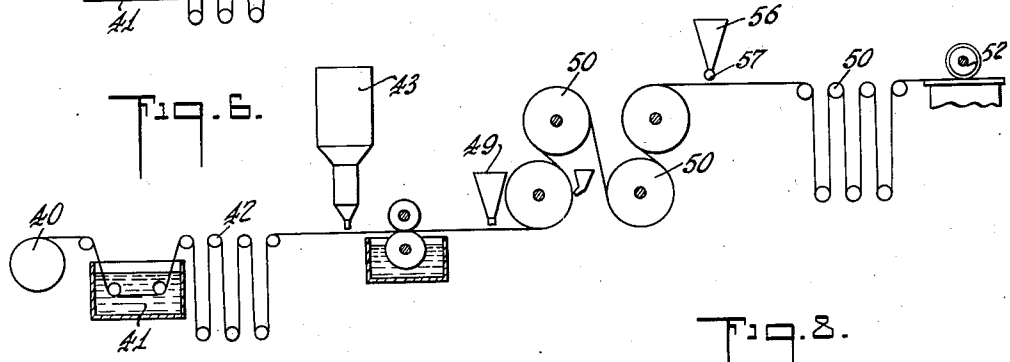


Fig. 7.

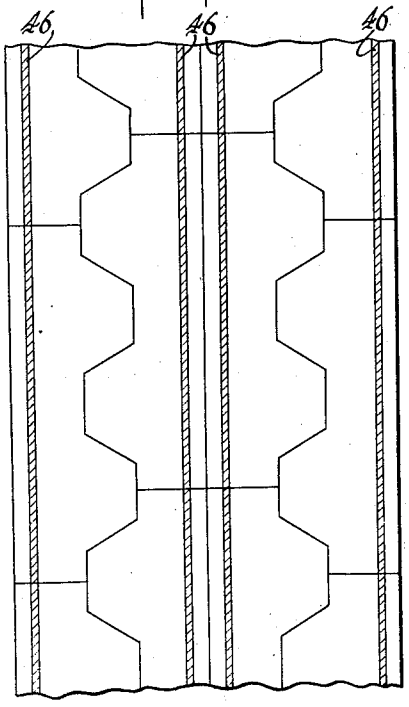
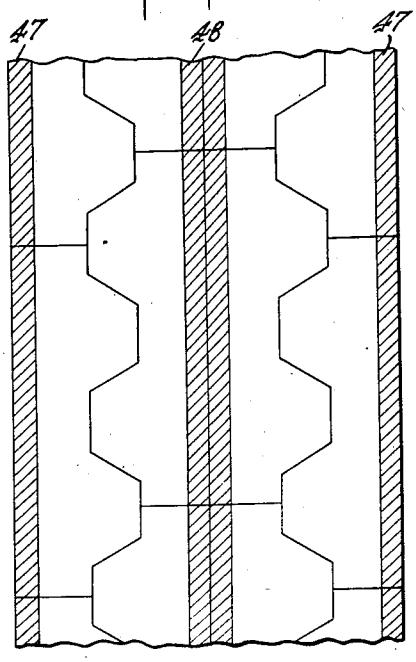


Fig. 8.



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Fig. 9.

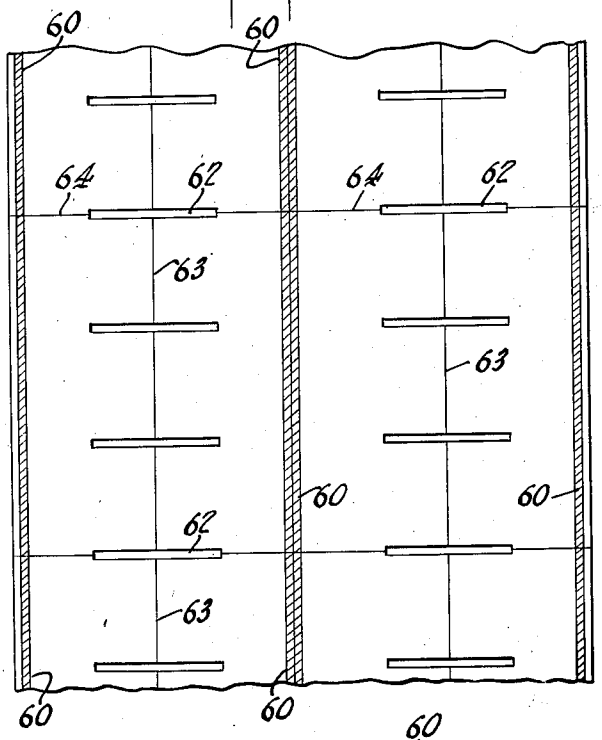
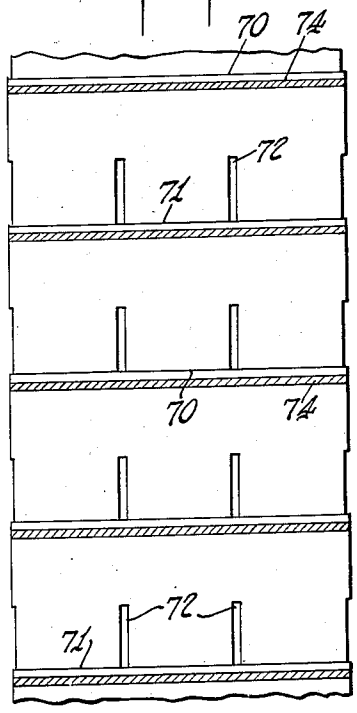


Fig. 10.



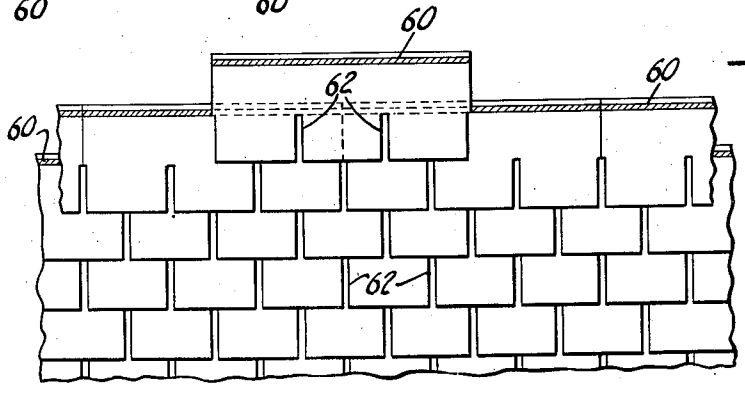


Fig. 11.

Fig. 12.

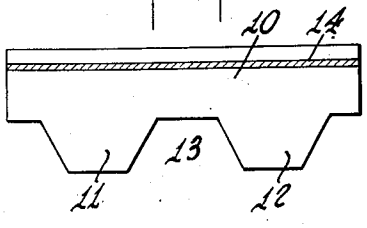
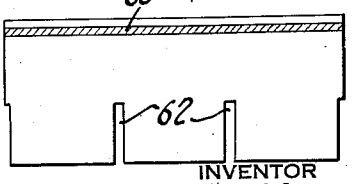


Fig. 13.



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UNITED STATES PATENT OFFICE

2,228,463

SHINGLE FOR ROOFING OR THE LIKE

Lester Kirschbraun, New York, N. Y., assignor to The Patent and Licensing Corporation, New York, N. Y., a corporation of Massachusetts

Original application July 6, 1935, Serial No. 30,210. Divided and this application March 5, 1940, Serial No. 322,275

3 Claims. (Cl. 108—7)

This application is a division of my co-pending application Serial No. 30,210, filed July 6, 1935.

This invention is concerned with an improvement in shingles or other forms of covering elements for roofs, sidewalls, and like surfaces which are exposed to the weather.

More particularly, the invention concerns an improvement in so-called composition roofing of the type prepared from a flexible base and known generally as asphalt prepared roofing.

When roofing or other surface coverings, such as shingles or shingle strips are laid in successive overlapping courses on a roof or side wall, the protection that the covering affords to the roof or other surface against leakage depends, amoug other things, upon the amount of lap between the successive courses. While this can usually be regulated to insure against leakage, as for example through the joints between adjoining elements or otherwise, and while the base material itself may be waterproof, it has been observed that water on the surface of the shingles tends, by capillary action, to travel upwardly between the adjacent surfaces of the overlapping shingles. This is particularly so with roofs or other surfaces which do not have a very steep pitch. This tendency is aggravated with material having on its weather surface mineral surfacing of a character readily wetted by water, resulting in a wick action which causes water to ascend even on a steep pitch. The depth of the shingles in each course which is overlapped by the shingles of the succeeding course can be made sufficiently great to prevent any of the water that thus travels by capillary action between the adjacent surfaces of overlapping shingles from creeping over the uppermost edges of the shingles which are overlapped by shingles of succeeding courses. It sometimes happens nevertheless that the water does creep over the edges of the overlapped shingles thus reaching the roof boards particularly under the influence of high winds which propel and drive the water upwardly. This tendency is particularly pronounced in the case of shingle strips of the so-called hexagonal type, wherein the tabs along the butt of the shingle are spaced from one another by areas corresponding in size and shape to the tabs themselves so that a corresponding area of the subjacent course of shingles is exposed between the tabs of each course when such shingles are laid in the usual manner. In certain types of these shingles there are only two inches of distance for water to reach the roof deck. Even where the shingles are of sufficient depth to provide against such contingency, the water that neverthless travels upwardly between the adjacent surfaces of overlapping shingles sometimes, particularly in cold weather, freezes and thus tends to distort the shingles. It is evident in any event that the presence of water between adjacent surfaces of overlapping shingles, particularly in the region of the uppermost edge of the shingles, has a marked tendency in numerous ways to detract from the durability of the covering.

It is a principal object of my invention to provide roofing material in which water is prevented from travelling by capillary action and by driving force of the wind upwardly between adjacent surfaces of overlapping shingles.

Broadly stated, my invention consists in forming a water-repellent barrier on one face of these shingles, more especially the exposed face thereof, such barrier being preferably in the form of a horizontal band preferably commencing along the line marking the upper limit of exposure of an overlying shingle or the upper edge of the exposed area of each shingle, for a distance transversely of the units sufficient to accomplish the broad objective above stated.

More particularly, it is an object of my invention to provide such an arrangement in connection with shingles of the prepared composition type in which a water-resistant felt base is coated with asphalt or the like and surfaced with crushed mineral grit, although it is to be understood that the invention is applicable to shingles made of other types of base material.

The water-repellent barrier formed on the shingles in accordance with my invention is obtained by treating the desired areas in a manner to be more fully hereinafter described so that the surface, along such areas, is characterized by a high surface tension relationship to water.

It will be appreciated by those skilled in the art that the reference here made to a water-repellent barrier does not imply that the shingles themselves are deficient in respect of their waterproof nature, but rather has to do with the provision or imposition of water-repellent or high surface tension material upon certain portions of the surface of the shingles so that such surface will shed the water tending to creep over it. In this way water is prevented from travelling by capillary action between such surface and the contacting or confronting surface of an overlapping shingle.

The invention will be more particularly described herein with reference to the production of roofing of the asphalt coated mineral surface

type, but as above indicated, is adaptable for use in connection with other types of base material.

In the accompany drawings:

Figure 1 is a plan view of a section of roofing or other surface composed of shingle strips embodying my invention;

Fig. 2 is a similar view showing modifications in the adaptation of the invention;

Fig. 3 shows another form of shingle embodying the invention;

Fig. 4 is a view showing a section of roof or other surface laid with shingles such as shown in Fig. 3;

Fig. 5 is a diagrammatic view showing an arrangement of apparatus for producing shingles embodying the invention;

Fig. 6 is a similar view showing an arrangement of apparatus for a modified procedure for the production of shingles embodying the invention;

Fig. 7 is a view in plan showing a sheet of material treated in accordance with one embodiment of the invention for the production of shingle strips such as are shown in Fig. 1;

Fig. 8 is a similar view showing material treated according to the invention for the production of shingles such as are shown in Fig. 2;

Figs. 9 and 10 are views similar to Figs. 7 and 8 but showing the adaptation of the invention for the production of different forms of shingle strips;

Fig. 11 is a view in plan showing several courses of shingle strips of the form shown in Figs. 9 and 10; and

Figs. 12 and 13 are plan views of the strips shown in Figs. 1 and 11, respectively.

Referring first to Figure 1 of the drawings, it will be noted that this depicts a strip shingle of a standard well-known configuration, being the so-called hexagonal strip shingle in which the body portion **10** of the shingle is formed with semi-hexagonal tabs **11** and **12**, the tabs being separated from one another by spaces **13** complementary in shape and equal in size to the tabs, and there being the usual half space at the ends of the strip.

The strip is provided in the upper part of its body portion with a zone, indicated by the numeral **14**, in which the surface of the strip has a high surface-tension relationship to water. This characteristic is obtained by a treatment which will be hereinafter more fully described.

As more particularly shown in Fig. 1, the zone **14** is in the form of a horizontal band extending the full length of the strip. The lower extremity **15** of the band, in this form of the invention, marks the upper limit of exposure when the strips are laid in successive courses as shown; in other words, it coincides with the upper horizontal edge of the hexagonal areas exposed by the semi-hexagonal tabs. The upper boundary **16** of the band as shown in Fig. 1 terminates below the upper edge **18** of the strips. Thus, the band may, in practice, be approximately ½" wide. If desired, however, the band may extend from the lower boundary **15** to the upper edge **18** of the strip as shown at **14a** in the modified form of Fig. 2.

While in each of the figures of the drawings, the water-repellent band is indicated by stippling in order to demark it from the remainder of the surface of the shingles, it will be understood that this band need not necessarily differ in color from the remainder of the surface; in fact, the treatment for rendering the surface water-repellent along the desired areas need not in any way affect the normal color of the surfacing material employed on the shingles. However, in certain instances the treatment for producing the water-repellent band may include pigmentation so that the water-repellent band will be different in color from the remainder of the surface. Also, as illustrated by the modified form of Fig. 2, the treated band, particularly where it is colored black or darker than the remainder of the surface, may be made to extend a distance slightly below the line of the edges **17** of the body portion of an overlapping strip. In such case, a portion of the black or dark colored band **14a** is presented to view below the butt edges of the shingles in the second overlying course and will constitute a shadow line to impart to the butt edges an appearance of increased thickness when viewed from a distance.

In Fig. 4 I have shown an adaptation of the invention to standard individual shingles **20**, wherein the water-repellent band is indicated by the numeral **21**.

In Fig. 13 I have similarly shown an adaptation of the invention in conjunction with so-called square butt strips wherein the water-repellent line or band is indicated by the numeral **25**.

The treatment for producing the water-repellent band on the shingles may be applied to the parent sheet of prepared roofing material from which the various forms of shingles or strips may be severed. This treatment may, in general, take either one of two forms, namely, (*a*) the deposition of a band of the water-repellent material upon the surface of the prepared sheet along the predetermined lines or zones depending upon the type of shingle that is to be cut from the sheet; or (*b*) the pretreatment of the surfacing material, such as crushed slate or other comminuted material, with the water-repellent substance and then depositing the thus treated surfacing material along the predetermined lines or zones of the sheet.

Some of the substances which I have found may be used for the purposes of the invention are metallic soaps such as zinc stearate, aluminum stearate, zinc laurate, aluminum palmitate, and paraffine wax or other materials having similar properties of increasing surface tension.

In general it may be stated that the first method (wherein the water-repellent substance is deposited as by printing the same with a roll or the like on the previously surfaced sheet) requires greater quantities of the water-repellent substance than the second method above described (wherein the water-repellent substance is applied to granules which are subsequently used as a surfacing in the zones where the water-repellent band is to be located). The first method, however, has been found suitable when the metallic soap is suspended in volatile or non-volatile liquid in which the soaps are not readily soluble. It likewise is suitable when using molten paraffine as the water-repellent substance.

In carrying out my invention with the second method using metallic soap as the water-repellent substance, 50 to 100 pounds of the soap per ton of granules may be melted and mixed with heated granules, with or without pigmentation as desired. In such case, however, the adhesion of the thus treated granules to the asphalt coating is sometimes impaired. Alternatively, the metallic soap may be dissolved in toluol or other volatile solvent and 3 to 5 gallons of a 20% solution of the soap in the solvent per ton of granules

may be employed for coating the granules. In this case, however, the volatile solvent must be removed during the course of the preparation of the granules or after the treated granules have been applied to the sheet. The metallic soap may also in some instances be suspended in a non-volatile solvent, but in such case, particularly with certain types of non-volatile solvents, there is a tendency for the soap and solvent to form a grease and the water-repellent characteristics of the metallic soap are somewhat impaired.

In order to avoid the possibility of loss of adhesion of the granules to the asphalt coating and to avoid also impairment of the water-repellent characteristic of the soap, the metallic soap may be suspended in powdered form in a non-volatile hydro-carbon liquid in which the soap is not readily soluble at normal temperatures. When the granules are treated with such a suspension in the cold, the hydro-carbon merely soaks into the surface of the granules, leaving the metallic soap deposited in an adherent condition on the surface of the granules. In this procedure, there may be employed, for example, 5 to 10 pounds of the soap suspended in from two to five gallons of spindle oil per ton of granules, depending upon the porosity of the granules.

Fig. 5 of the drawings shows in diagrammatic form an arrangement of apparatus for carrying out the invention by procedure designated (*b*) above, namely by pretreating granules with water-repellant substance in the manner above described and applying the thus treated granules to the sheet in the course of preparation thereof, along the predetermined zones. In this figure, the numeral **40** represents a roll of fibrous felt of the type normally employed for making composition roofing. This felt may be carried through a conventional form of saturating tank **41** where it is impregnated with asphalt or other waterproofing material. After being thus impregnated, the sheet may be passed over loopers **42** to permit the sheet to cool and the saturant to soak into the fibrous base. The sheet then passes to the coating stage where a layer of asphalt coating may be supplied to the upper surface thereof as from a feed conduit **43**. The sheet may then pass under a doctoring roll **44** which doctors the coating layer to desired thickness. Thereupon the sheet may pass under a hopper **45** containing granules pretreated with water-repellant material in any of the ways above described. The granular material from the hopper **45** may be discharged through feed pipes or spouts so as to adhere to the coating on the sheet in lines as indicated by the numeral **46** of Fig. 7, if the water-repellent zone is to be in the form of a narrow horizontal band as shown in Fig. 1. If the water-repellent band is to extend all the way to the upper edge of the strips, the granules from the hopper **45** may be deposited, as shown in Fig. 8, along marginal lanes **47** and along a central lane **48** which will be twice the width of each of the lanes **47**. After the lanes of water-repellent granules are thus deposited upon the sheet, the sheet passes under a hopper **49** from which granules for surfacing the remaining portions thereof are delivered to the sheet in the usual way. The sheet then passes around conventional forms of pressing and cooling drums **50** which cause the granules to become firmly embedded in the layer of asphalt coating material. After the sheet passes through the cooling loopers **51**, it may be fed to the cutting device indicated conventionally at **52** for severing the shingles or shingle strips of desired configuration therefrom.

Fig. 6 illustrates an arrangement of apparatus for carrying out the invention by the procedure in which the water-repellent material is deposited upon the surfacing layer of grit or the like after the latter has been embedded in the asphalt coating. In this figure, the various stages of the treatment of the sheet which are the same as in the case of Fig. 5 are indicated by like reference characters. In this arrangement, however, the hopper **45** is not employed but after the sheet passes the press drums **50**, it may pass under a supply tank **56** containing the water-repellent material (either in molten condition or as a suspension in a suitable liquid, as above described) and from which the water-repellent material is applied, aided if necessary by a print roll **57**, to the mineral surfaced sheet along the desired lines, as for example those indicated at **46** in Fig. 7 or at **47—58** in Fig. 8.

In the plan view of Fig. 9, the parent sheet of material is shown as provided with the lanes **60** where the surface of the sheet has been rendered water-repellent either by pretreating the granules which are deposited along these lanes, or by applying water-repellent material to the granules on the sheet along these lanes. The sheet may then be provided with notches or cut-outs **62** and slitted centrally at **63** and severed transversely at **64** for the production of so-called square-butt strip shingles of the form shown in Fig. 13.

In Fig. 10 the plan view illustrates the adaptability of the invention for the production of shingle strips of the form shown in Fig. 13 by severing such strips from the sheet in the transverse direction along lines indicated at **70** and **71**, the tabs of the strips being defined by transverse rows of longitudinally extending slots or cut-outs **72**. In this adaptation the bands or lanes of water-repellent material **74** are applied transversely of the sheet at spaced intervals, depending upon the width of the strips being cut and their relative exposures.

The water-repellent barrier which is thus imposed upon the weather surface of the material in accordance with the invention functions to prevent water from wetting the surface along the treated areas. This may be readily observed in the finished product by flowing water onto the surface, when it will be seen that as the water is caused to reach the boundary of the treated area, the water will spread sidewise along the boundary of the barrier but will not traverse the barrier unless perhaps caused to do so by being placed under a considerable head.

While I have illustrated and described a preferred embodiment of the invention in which the waterproof barrier is in the form of a narrow band along the upper portion of the weather face of the finished product, it will be understood that the water-repellent material may be applied over larger areas of the weather face, and indeed over the entire weather face thereof. The narrow band as described with reference to the preferred embodiment, as will readily be appreciated, simply represents a form of the invention which makes for considerable economy as compared with application of the water-repellent material to the entire weather face.

I claim:

1. A shingle comprising a waterproof fibrous base coated on the face thereof to be exposed with weather protective asphalt, said coating

having a layer of mineral grit partially embedded therein, the mineral grit being provided with a band of water-repellent material, said band of water-repellent material extending longitudinally of the shingle intermediate the upper and lower edges thereof, the lower extremity of said band being located adjacent the upper boundary of the exposed area of the shingle, whereby to prevent passage of water by capillary action between the mineral grit surface and the next overlying shingle.

2. A shingle comprising a waterproof fibrous base coated on the face thereof to be exposed with weather protective asphalt, said coating having a layer of mineral grit partially embedded therein, the exposed surface of said mineral grit layer being provided with a band of water-repellent material adapted to prevent passage of water by capillary action between said surface and the next overlying shingle, said band extending longitudinally of the shingle intermediate the upper and lower edges thereof, the lower extremity of said band being located adjacent the upper boundary of the exposed area of the shingle.

3. A shingle comprising a waterproof fibrous base coated on the face thereof to be exposed with weather protective asphalt, said coating having a layer of mineral grit partially embedded therein, the exposed surface of said mineral grit layer being provided with a band composed of water insoluble metallic soap adapted to prevent passage of water by capillary action between said surface and the next overlying shingle, said band extending longitudinally of the shingle intermediate the upper and lower edges thereof, the lower extremity of said band being located adjacent the upper boundary of the exposed area of the shingle.

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