July 4, 1939. L. KIRSCHBRAUN 2,164,712

SHINGLE

Filed Sept. 28, 1937

Fig. 1.

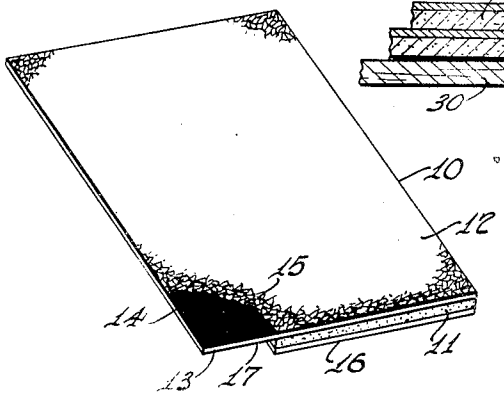


Fig. 3.

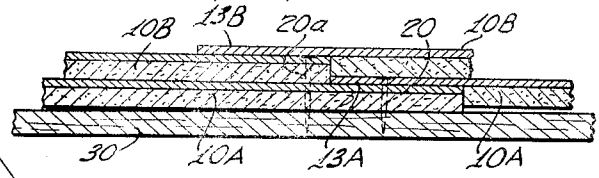


Fig. 2.

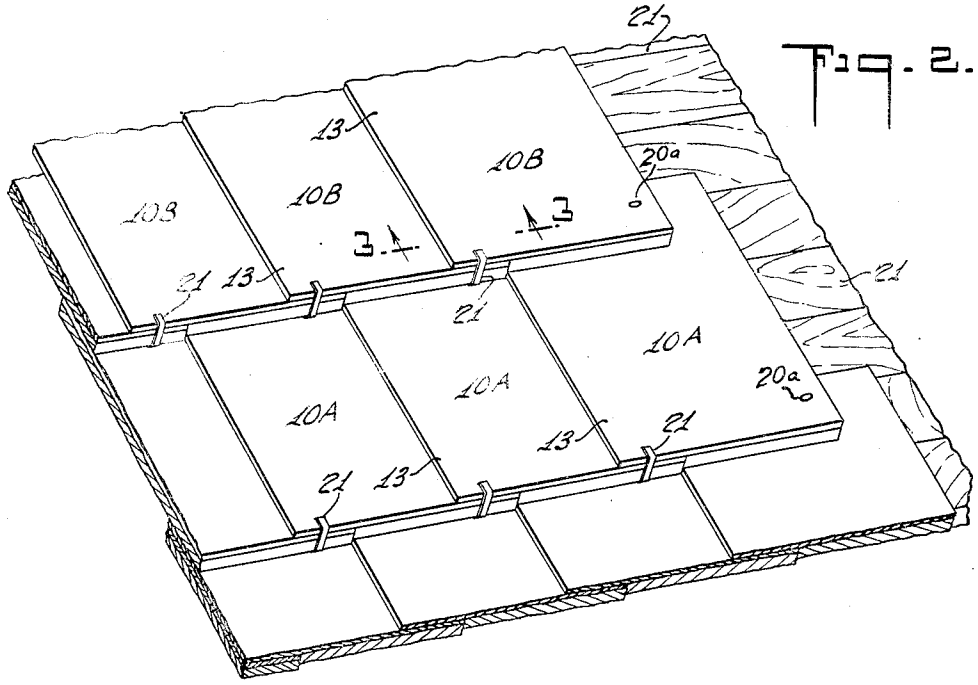
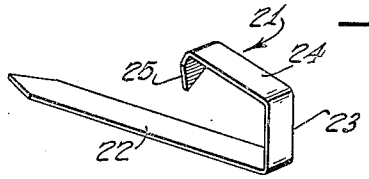


Fig. 4.



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2,164,712

UNITED STATES PATENT OFFICE

2,164,712

SHINGLE

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2 Claims. (Cl. 108—8)

My present invention relates to composition roofing shingles of the type in which the major portion of the shingle body is composed of a plastic material that is capable of setting to a more or less hardened condition. More particularly, the invention is concerned with mastic shingles of this type adapted to be laid in a manner that permits the major portion of their areas to be exposed to the weather.

Mastic shingles of conventional construction generally comprise a hardened plastic body composed of bituminous material such as asphalt or like waterproofing substance, mixed with fiber of any suitable character and hardening fillers, such as finely divided solids, as for example, clay, talc, crushed slate, slate dust and the like, the body portion being faced on one or both sides with a sheet of fibrous waterproof material such as asphalt impregnated felt. Shingles of this type exhibit numerous advantages over those composed of asphalt coated fibrous felt, due to their relative rigidity, massive and pleasing appearance and increased resistance to raising from the roof or side wall when exposed to the weather. The hardened plastic compositions are, however, comparatively heavy and costly and accordingly the shingles heretofore prepared therefrom when laid in the manner conventionally employed, i. e. in successive courses with each course overlapping preceding courses to such an extent as to require in excess of 200 square feet of material to cover 100 square feet of roof area, the amount of material thus required makes for relatively heavy weight and high cost of the finished roof. It has heretofore been proposed to reduce the weight and cost of the roof by laying mastic shingles with less than the conventional overlap between successive courses and with the greater proportion of their area exposed. The proposed practice has, in most instances, required the use of a waterproof underlayment, such as a layer of asphalt saturated felt or the like, beneath the shingles to make up for the loss in weather proofness resulting from the reduction in headlap. The use of such underlayment, though effective for its intended function, requires additional steps in the roof construction and hence does not provide a wholly satisfactory solution to the problem here involved.

The object of the present invention is to provide mastic shingles employing a hardened plastic composition of the type referred to above as their major constituent, the shingles being so constructed that they may be readily laid with the major portion of their area exposed, without detracting from the weather-resistant characteristics of the roof and without necessitating the use of any underlayment.

This object is attained according to the present invention by the provision of a shingle comprising a hardened plastic body portion and a reinforicng facing sheet secured to the upper face of the body portion and extending from one lateral edge thereof. Shingles of this construction are, in accordance with the invention, laid in successive courses according to a modification of the so-called "Dutch lap" method, with the extending portions of the facing sheets of all of the shingles of a course projecting in the same direction and each extension overlapping the facing sheet of a coursewise adjacent shingle, the body portions of adjacent shingles lying in edgewise contiguous relationship. Shingles constructed according to the present invention and laid in this manner present the advantage that the amount of overlap between shingles of successive courses may be reduced to a relatively small fraction of the transverse dimension of the shingle. For example, as little as 20% of the width of each shingle may be employed as overlap inasmuch as the joints between coursewise adjacent shingles are, in each instance, covered by the extension of the facing sheet of an adjacent shingle. The exposure of such relatively large portions of the shingles, as compared with the proportionate exposure provided by the laying of conventional shingles according to regular practice, represents a considerable saving in the number of units required to cover a given area of surface, thus reducing the cost of material and labor required for covering the roof. Furthermore, the time and labor for the laying of the roof is substantially reduced as compared to roofs in which an underlayment is required. A roof laid from the shingles of, and in accordance with, the present invention presents an appearance similiar to one laid in the "Dutch lap" manner except that the butt edges present an enhanced thickness due to the contrast between the combined thicknesses of the body portion and facing sheet exposed at the butt edges of the shingles and the lesser thickness of the facing sheet appearing at the lateral edges of each shingle.

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

Figure 1 is a perspective view of a shingle embodying the present invention;

Figure 2 is a perspective view of a portion of a roof laid with the shingles of Fig. 1;

Figure 3 is a sectional view taken on the line 3—3 of Fig. 2, and

Figure 4 is a perspective view of a fastening clip which may be employed with the shingles of Fig. 1.

Referring to the drawing and particularly to Fig. 1, there is illustrated a shingle 10 constructed according to the present invention and comprising a mastic body portion 11 and a facing sheet 12. The mastic body portion is preferably formed of a suitable hardened plastic material composed of bituminous material such as asphalt or like waterproofing substance mixed with fiber of any suitable character and hardening fillers such as finely divided solids as, for example, clay, talc, crushed slate, slate dust, cork, cork dust and the like. A convenient souce of raw material that may be employed to form such composition resides in scrap roofing that accumulates in the manufacture of felted, fibrous asphaltic prepared roofing. Since the latter is generally composed of asphalt constituting the waterproofing medium, fibrous material constituting the base, and mineral grit constituting the surfacing, scrap roofing of this nature in most instances is admirably suited for the purpose of this invention but, if desired, there may be combined therewith further quantities of asphalt and fillers to vary the consistency and composition of the mixtures for the formation of the plastic mass as required in actual practice. The mastic asphalt composition here contemplated and containing fiber and mineral material admixed as described above, is practically non-fluid at elevated temperatures, greatly in excess of the melting point of the asphalt contained therein, and assumes a substantially rigid condition at normal temperatures.

The facing sheet 12 is secured to the upper surface of the mastic body portion 11 by any suitable adhesive means which preferably comprises the asphaltic constituent of the body portion. The facing sheet 12 extends from the butt edge to the upper edge of the body portion. In the other dimension of the body portion, the facing sheet 12 extends from one lateral edge of the body portion to a distance beyond the other lateral edge thereof to form a lateral extension or lapping portion 13. The extension 13 may be made of any suitable width to insure a weather-resistant construction when the shingles are laid, and preferably comprises from one-sixth to one-third of the width of the sheet 12. A thin layer 17 of the plastic of which the body is composed preferably covers the underface of the extension 13. The facing sheet 12 is a fibrous material impregnated with a suitable waterproofing material and carrying a weather-resistant coating and/or surfacing on its exposed surface. Such sheet preferably consists of an asphalt saturated felt carrying a coating 14 of a high melt-point asphalt applied in a molten state or a layer deposited from an emulsion of asphalt in water which contains a suitable quantity, say an amount equal to the emulsion, of a weighting and rigidifying material such as Portland cement. A suitable surfacing material 15 such as crushed slate, crushed slag or the like of any desired color is partially embedded in the coating 14. The sheet 12 serves not only to provide the lapping portion 13 but also to reinforce the body portion against distortion and to resist sloughing and pulling away of the same from the nails when the shingle is laid and subjected to solar heat. The facing sheet furthermore provides the shingle with a decorative finish by virtue of the mineral grit 15 carried by the facing sheet. An additional reinforcement for the body portion may be provided, if desired, this comprising a backing sheet 16 secured to the lower face of the body portion. The backing sheet 16 also preferably comprises an asphalt saturated felt or the like. Materials other than asphalt saturated felt may, however, be employed for the backing sheet 16, such for example, as ordinary kraft paper, saturated with asphalt or other waterproofing material.

A roof covering in accordance with the present invention may have the shingles thereof laid either in a left-to-right or right-to-left direction by properly positioning the shingles so that the extensions or lapping portions 13 lie to the left or right respectively of the shingle body portion. In the construction of a roof covering with the shingles laid in the left-to-right direction, as illustrated in Fig. 2, each successive shingle 10 of a course is adjusted so that its lapping portion 13 is on the left and overlaps the face of the next shingle to the left thereof in the course, and the left transverse edge of its body portion lies contiguous to the right hand edge of the body portion of the shingle to the left thereof. Nails or the like 20 are driven through the shingles adjacent the upper left hand corner thereof and each shingle, as it is laid, is also nailed as at 20^a adjacent the lower right hand corner thereof in the area to be overlapped by the extension 13 of the adjacent shingle to the right. The lower left hand corners of the shingles may be secured in any suitable manner, the securing means preferably comprising clips or staples which may take the form of the clip 21 as disclosed in Fig. 4. The clip 21 of Fig. 4 is applied by inserting the arm 22 thereof between a shingle and the shingle of a preceding course overlapped thereby, until the shank 23 thereof lies closely adjacent the butt edge of the overlapping shingle. The upper arm 24 of the clip is then bent downwardly to lie on the surface of the shingle and the extending prong 25 driven into the shingle by a hammer blow or the like. The thin layer 17 of the plastic material on the under-surface of the extension of each shingle serves as a sealing and packing medium to insure a weather-resistant joint between coursewise adjacent shingles.

Subsequent courses of shingles are laid in a similar manner to that described above, any desired amount of head lap being employed. As illustrated in Fig. 2, the relative overlap between successive courses may be but 20% or less of the transverse dimension of the shingles due to the fact that the joints between coursewise adjacent shingles are covered by the lapping portions 13. The shingles of the subsequent courses in the left-to-right application shown in Fig. 2 are so laid that the right edge of the body portion of each shingle abuts against the upper part of the left edge of the extension 13 of the shingle to the right thereof in the next lower course and the left edge of its body portion is superposed over the left edge of the extension 13 of a shingle immediately therebelow in the next lower course, as clearly shown in Fig. 2. The relationship between the overlapping portions of coursewise adjacent shingles and shingles of suc-

cessive courses is illustrated cross-sectionally in Fig. 3. As can be observed from this view, the joints between adjacent shingles 10A of the underlying course are protected by the extension 13A and are staggered with respect to the joint between shingles 10B of the overlying course. The joint between the shingle 10B of the overlying course is in turn protected by the extension 13B. As will readily be observed, this construction provides an overlapping weather-resistant joint structure.

As previously stated, the roof illustrated in Fig. 2 and described in the preceding paragraph has the shingles laid thereon in a left-to-right direction. However, the shingles may be laid in the right-to-left direction, if desired. In this event the shingles are reversed so that their extensions are on the right and each course is started at the right hand edge of the roof.

In the production of the shingles of the present invention, a homogeneous plastic mass of bituminous material such as asphalt of say 140 to 280° F. melt-point and hardening fillers is formed, the mixture being worked up and brought to the desired consistency in any suitable form of kneading mechanism. As heretofore stated, prepared asphalt roofing scrap may be employed for this purpose and combined, if desired, with further quantities of the bituminous material, fiber and other fillers such as slate dust, talc, mica and the like to impart to the final plastic the desired rigidity and strength. The plastic material, prepared in this manner, may be fed while at an elevated temperature from a suitable storage supply in a continuous flow between an opposing pair of co-operating forming rolls, suitably constructed to provide one or more plastice ribbons of the desired shingle body widths, simultaneously with the feeding of a sheet of the facing material 12 between the surface of one of the rolls and the plastic mass and a sheet of the backing material 16, if desired, between the surface of the other roll and the plastic mass. The sheet of the facing material 12 is of such width as to extend past one edge of each of the plastic ribbons. As the sheets and plastic material are pressed together at the nip of the forming rolls, they become adhesively secured together by the asphaltic constituent of the plastic material and a small amount of the plastic extends from the mass and forms a thin layer on the underface of the extending portion of the facing sheet to provide the mastic layer 17 (see Fig. 1). The facing sheet may comprise an asphalted saturated felt previously coated with an asphalt and surfaced with a mineral grit or the coating and surfacing for the facing sheet may be applied thereto subsequently to the laminating of the sheet to the mastic body strips. The plastic body strips with the facing material laminated to one surface thereof and the backing material laminated to the other surface, if desired, are then cut off at suitable intervals to provide the shingle elements as disclosed in Fig. 1.

Having thus described my invention in full detail, it will be apparent that these details need not be strictly adhered to and that various changes and modifications may be made therein without departing from the scope thereof as defined in the appended claims.

What I claim is:

1. A roof covering comprising partially overlapping courses of shingles each of said shingles comprising a body portion of hardened plastic material and a sheet of asphalt saturated and coated mineral surfaced felt affixed to the upper face of the body portion and extending beyond one lateral edge thereof to form a lapping portion, the butt edge and the other lateral edge of the body portion of each shingle being coterminous with the corresponding edges of the sheet affixed thereto the lapping portion of each shingle of a course overlapping an adjacent shingle of the course with the body portions of adjacent shingles lying in edgewise contiguous relationship and a thin layer of the plastic material lying between each of said overlapping portions and the underlying shingle.

2. A roof covering comprising partially overlapping courses of shingles, each of said shingles comprising a body portion of hardened plastic material and a sheet of asphalt saturated mineral surfaced felt affixed to the upper face of the body portion and extending beyond one lateral edge thereof to form a lapping portion, the butt edge and the other lateral edge of the body portion of each shingle being coterminous with the corresponding edges of the sheet affixed thereto the lapping portion of each shingle of a course overlapping an adjacent shingle of a course with the body portions of adjacent shingles lying in edgewise contiguous relationship and the lower portions of the body portions of the shingles of an overlapping course resting on the surfaces of corresponding shingles of the underlying course, whereby the shingles have three overlapped corners and one corner exposed and means securing the exposed corner to an underlying shingle of the same course.

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