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FIBRATED MASTIC COATINGS

Joseph F. Schulz, Allendale, N.J., assignor to The Patent and Licensing Corporation, New York, N.Y., a corporation of Massachusetts

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The present invention relates to an improved fibrated mastic coating and to a process for preparing it and more particularly to a fire-resistant roofing utilizing the fibrated mastic coating produced by the improved method.

Roofing material comprising a web of roofing felt, or the like, coated with a bituminous material and containing granules embedded in the outer surface thereof is well known. The most common type of such material is known as a strip shingle wherein a wood fibre or rag felt is saturated with a bituminous material, then coated with a plastic bituminous material into which are compressed roofing granules of crushed rock, slate, or the like. Rectangular pieces of this material are usually slotted with two slots vertically from the bottom edge thereof to form three tabs. Ofttimes the lower or tab portion of the shingle is coated with an extra layer of bituminous coating into which the roofing granules are compressed and this type of shingle is the type commonly known as "thick butt."

Because the roofing or shingles so produced contains a substantial amount of bituminous material such as coal tar or asphalt and is based upon a felt of wood fibre, rags, or the like, the material is susceptible of burning.

Ordinary bituminous roofings of the character described have limited fire retardant properties. The Underwriters' Laboratories Inc. generally rate materials of this type with a Class "C" rating provided they meet with certain specified standards as to material, construction and ability to pass the prescribed burning brand and flame exposure tests. More severe tests are provided for roofing materials carrying a "B" or "A" label which materials must pass more severe burning tests. So far as we are aware, roofing materials with a bituminous coating are not rated "B" or "A" except for one product which contains a very substantial amount of asbestos in a very heavy shingle weighing about 325 pounds to the square of double coverage strip shingle.

It is an object of the present invention to provide an improved fibrated mastic coating.

It is a further object of the present invention to provide an improved process for producing an improved fibrated mastic coating.

It is a further object of the present invention to provide an improved bituminous roofing material of substantial fire-resistance containing an improved fibrated bituminous coating.

It is a further object of the present invention to provide an improved bituminous roofing shingle having substantial fire resistance but of a weight not substantially exceeding that of the usual Class "C" shingles.

It is a further object of the present invention to provide an improved process for producing a bituminous roofing material with an improved fire resistance and relatively light weight.

These and other objects are attained by the present invention which provides an improved process for producing a fibrated mastic coating and the product made thereby and more particularly provides a process for introducing quantities of fibre such as asbestos fibre into

asphalt or other plastic material in quantities which ordinarily require involved mixers and large power apparatus together with screw feed equipment and other devices to handle the fibrated material. The fibrated mastic coating so produced may be used to produce a relatively fireproof asphalt shingle, for example.

The invention may be best understood by reference to the herein described specific examples illustrating preferred embodiments of the invention but it will be understood that variations and substitutions may be made within the scope of the claims.

For example, it is possible to readily mix and handle a composition of about 25% by weight of 8S asbestos in asphalt with conventional batch mixers but with mixtures containing substantially more than 25% of 8S asbestos, as for example, 40% to 75% cannot be so mixed. In accordance with the present invention a mixture of 25% of 8S asbestos in a coating asphalt is applied to a base which may be a sheet of saturated roofing felt. Sufficient 8S asbestos fibres to bring the content of asbestos to 68% were sprinkled over the surface of the 25% coating by means of a shaker device. While the sheet is heated above its softening point, the surface of the coating material is then rolled pressed to introduce the asbestos into the asphalt. A sheet material made in this fashion shown a very definite increase in static qualities and fire-resistance.

Alternatively, a film may be prepared without a felt backing which may in turn be used as a truly feltless shingle. For this purpose a base such as a steel plate is used which is covered with a release material or parting agent such as an aluminum foil. A layer of coating asphalt containing about 25% 4K asbestos is then applied to the parting sheet by means of a doctor blade to a thickness of about one-eighth inch, although various thicknesses may be used. Over this 8S asbestos is applied by means of a shaker until sufficient asbestos is present to form a 68% fibre content. The material is then pressed in a press until the fibres are absorbed in the asphalt. An additional layer is built up on top of the first layer and this contains some long fibre asbestos in addition to the 8S fibres. After pressing, the material is cooled and the self-sustaining sheet of asphalt and asbestos thus formed is stripped from the aluminum foil and cut into shingle form.

In producing a fire-resistant, light-weight roofing material from either of the above examples the sheets are preferably further covered on the exposed side with a layer of clay-asphalt emulsion in which there is then embedded a layer of roofing granules. The heat of the sheet is such as to set the emulsion sufficiently to hold the granules. The surface of the sheet is then subjected to the heat from a bank of infra-red gas burners to remove a substantial amount of water from the emulsion.

The above composition is concerned with the colloidal clay dispersions of normally solid bitumen in water. Dispersions of this type have been described in a number of patents to Lester Kirschbraun including United States Patents 1,479,042, 1,302,810, 1,398,201, 1,495,260, 1,506,371, 1,734,437 and others. In general these dispersions are made by first preparing a thick aqueous suspension of colloidal clay and heating it to a temperature approximating the melting point of the bitumen to be used. The molten asphalt or tar is gradually added to the suspension of clay while the mass is subjected to rapid agitation. As the bitumen is introduced and continuously dispersed, the mass thickens and water is added to maintain the desired viscosity of the dispersion.

Since removal of the water from the clay emulsion is necessary in the production of the roofing, it is desirable that the clay emulsion have as low a water content as feasible while being fluid enough to be easily spread on the surface of the roofing. A water content of the

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emulsion of from 40% to 50% is desirable. With a water content in this range, application of the emulsion to the roofing over the hot base coating followed by the use of a bank of infra-red gas burners removes such a substantial amount of water that the deposited film of emulsion is quite static.

Preferably the base coating is about the same thickness as the emulsion coating. On a weight basis the filled first coating should in the case of thick butt shingles comprise at least twenty pounds per square of roofing and the dried emulsion coating should comprise at least ten pounds per square of roofing. Since the emulsion coating covers roughly one-half as much area of the shingle as the asbestos-containing coating, the two coatings are of about the same weight and thickness in the areas where they are both utilized. The coating bitumen is preferably asphalt with a softening point of at least 180° F. The first layer of granules on the base coating may be the usual oiled granules across the entire sheet. The final layer of granules may also be the regular oiled granules but it is preferable that granules containing no oil be used.

It will be understood that the clay emulsion produces a static film which when subjected to a burning brand does not tend to flow and expose the felt to the flame. Roofing made with the clay emulsion alone and without the asbestos filled base coating is substantially resistant to flame but involves substantial manufacturing difficulties, particularly in the removal of the water from the emulsion.

In addition to the substantial fire resistance attained with a relatively light weight roof (for example, about 210 pounds per square for double coverage strip shingles), there is also attained a roofing having a substantial freeness from blisters. Further, the present shingle has an increased life due to the unusual resistance of the clay emulsion coating to weather. Even if the exposed granules should become accidentally dislodged, the clay emulsion is sufficiently resistant to weather that it will not craze or alligator under sustained exposure in the manner of plain bitumen.

In carrying out the invention, if any base is contemplated, any ordinary roofing felt may be used whether it is made of wood fibres, rags or mixtures thereof. The dry felt is saturated with a saturating asphalt, as for example, one having a softening point of about 160° F. and a penetration of about 32 at 77° F. with 100 grams for 5 seconds.

In the manufacture of a roofing shingle with the fibrated mastic coating of the present invention the coating may be applied to a part only of the shingle as, for example, the exposed face only. However, for best results the coating should extend to an area of the shingle sufficient at least to cover not only the exposed area of the shingle but the area prescribed by the cut-outs of the next shingle above on the roof. This coverage applies also to the clay-bitumen emulsion or dispersion film.

I claim:

1. A process for producing an improved fibrated mastic coating comprising mixing about 25% by weight of asbestos fibre in coating bitumen, spreading the material into the form of a thin sheet, sprinkling additional asbestos fibre on the sheet in an amount up to 68% by weight of the total composition and pressing the additional asbestos into the sheet.

2. A process for producing an improved fibrated mastic coating comprising mixing about 25% by weight of asbestos fibre in coating bitumen, spreading the material into the form of a thin sheet, sprinkling additional asbestos fibre on the sheet in an amount up to 68% by weight of the total composition and pressing the additional asbestos into the sheet while maintaining the sheet at a temperature above the softening point of the coating bitumen.

3. A method for producing a roofing material comprising mixing coating asphalt with about 25% by weight of asbestos fibre, spreading the mixture on a sheet of roofing felt, sprinkling additional asbestos fibre up to 68% by weight of the total weight of the coating mixture, and pressing the fibre into the coating.

4. A method for producing a roofing material comprising mixing coating asphalt with about 25% by weight of asbestos fibre, spreading the mixture on a sheet of roofing felt, sprinkling additional asbestos fibre up to 68% by weight of the total weight of the coating mixture, and pressing the fibre into the coating and subsequently pressing roofing granules into the coating.

5. A process for producing a fire-resistant roofing comprising mixing about 25% by weight of asbestos with coating asphalt, spreading the coating on a sheet of roofing felt, sprinkling additional asbestos fibre on the coating in an amount up to 68% by weight of the total coating composition, pressing the sheet while the coating asphalt is heated above its softening temperature, applying a second coat of a clay-asphalt emulsion, pressing roofing granules into the clay-asphalt emulsion and drying the product.

6. A method for producing a feltless roofing material comprising mixing not substantially more than 25% by weight of asbestos fibre in coating-type bitumen, spreading the mixture into the form of a thin sheet, sprinkling additional asbestos fibre on the sheet in an amount up to 68% by weight of the total composition and pressing the additional asbestos into the sheet, wherein at least a part of the asbestos is long fibre asbestos.

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